

**CIVIL AVIATION AUTHORITY, BANGLADESH
MINISTRY OF CIVIL AVIATION AND TOURISM
THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH**

**DATA COLLECTION SURVEY
OF
OPERATION OF
INTERNATIONAL AIRPORT IN DHAKA**

FINAL REPORT

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Japan International Cooperation Agency (JICA)

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DATA COLLECTION SURVEY OF OPERATION OF INTERNATIONAL AIRPORT IN DHAKA

EXECUTIVE SUMMARY

1. INTRODUCTION

In recent years, the economy of Bangladesh has experienced an annual average growth of more than 6%. Thus, the number of passengers in Hazrat Shahjalal International Airport (hereinafter referred to as “HSIA”), which is one of the main entry points to the country, has increased at an average rate of 10% per year. In 2017, the total number of passengers was 7.7 million (international: 6.5 million, domestic: 1.2 million). Based on the annual departure and arrival statistics, the total number of aircraft movement is 87,000 (international: 47,000, domestic: 40,000). Thus, the HSIA is an infrastructure that has a significant role in enhancing the social economy of the country.

The volume of cargo is also increasing at an average rate of 8.4% per year for imports and 14.2% for exports between 2009 and 2016. In 2016, the HSIA was handling about 170,000 tons for export and about 110,000 tons of cargo. In comparison with Chubu Airport which handles about 160,000 tons and Haneda Airport which handles about 340,000 tons, it is clear that HSIA is handling a proximate large volume of cargo with the said airports in Japan.

Currently, airport operation is inefficient due to the defective operation system and the incompetent staff. Moreover, passenger service level is low because of problems such as long waiting times for check-in and baggage inspection and delay of departure caused by setbacks in ground handling. There are also serious problems regarding air cargo handling, like damaged cargo and cargo stored outside the terminal since airport personnel could not control the increasing volume of cargo.

Furthermore, airport operations must be urgently improved since the airport expansion is on the account of the Japanese Official Development Assistance (ODA) loan projects, which aim to provide a new passenger terminal building (T3) and a new cargo terminal in HSIA.

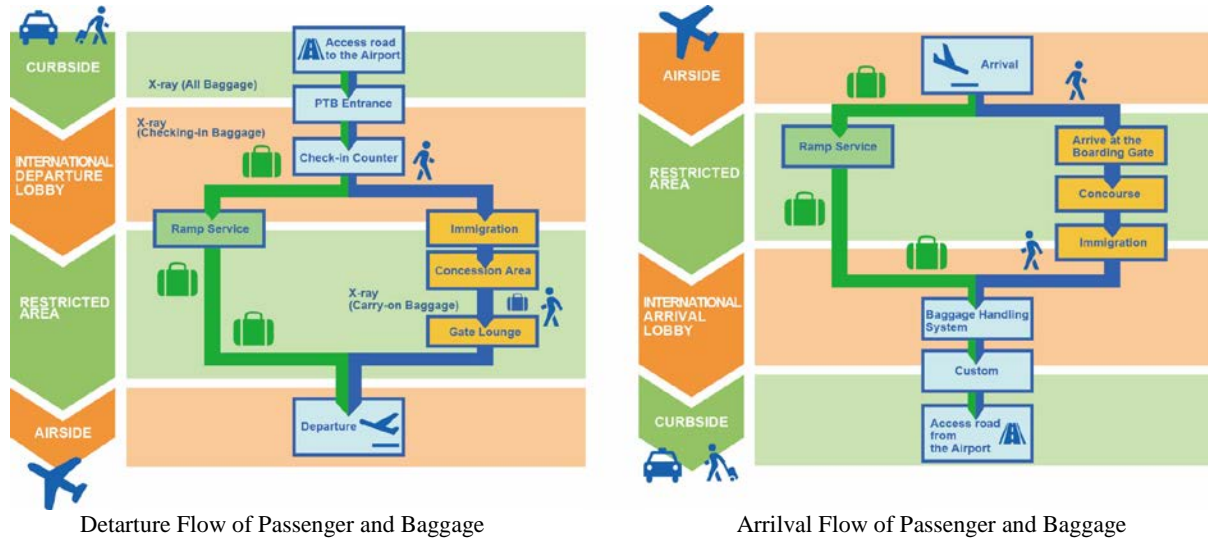
Referring to the background, the main objective of this study is to find the potential need for Japanese support by conducting a field survey as given below, and to consider a measure for each of them to improve the HSIA operation.

- Improve Passenger Service for International Flights
- Ramp Service (Ground Handling, etc.)
- Air Cargo Handling
- Terminal Management
- Operation and Maintenance of the Facilities
- Immigration and Customs

2. CURRENT CONDITION

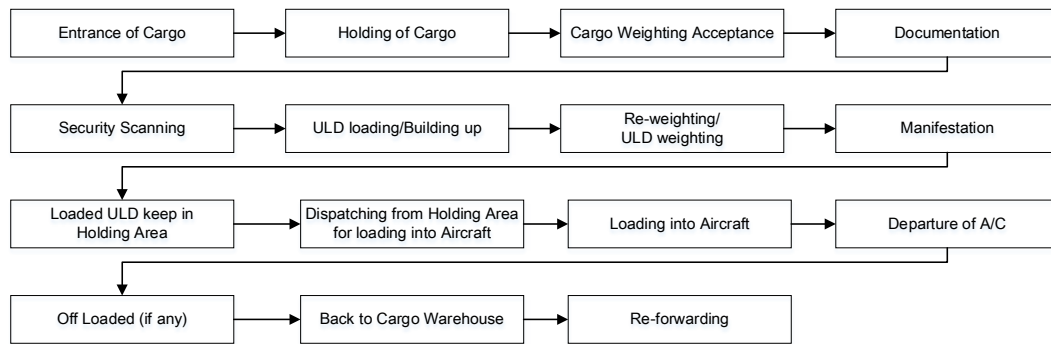
In this chapter, the related organization and the current situation of the airport operation of HSIA are explained through the collection of information taken from existing documents and results of the current situation and hearing surveys.

Regarding the operation situation, Figure 2-1 shows the flow of passengers and baggage, Figure 2-2 shows the flow of export cargo, and Figure 2-3 shows the flow of import cargo. The issues regarding these series of processes are explained in Chapter 5 by understanding the current situation.



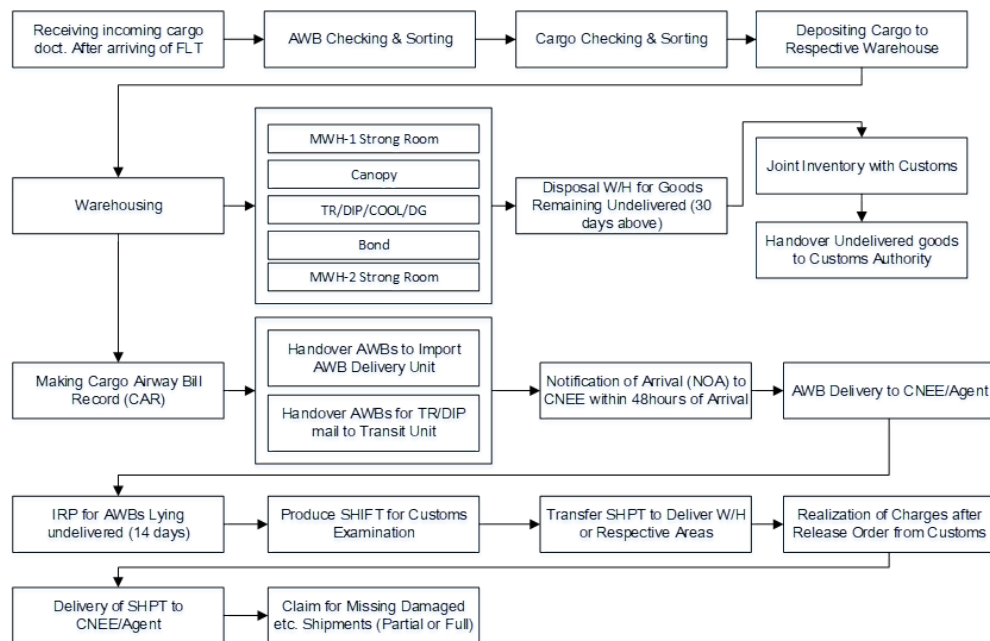
Source: JICA Study Team

Figure 2-1 Flow of Passenger and Baggage



Source: JICA Study Team

Figure 2-2 Flow of Export Cargo



Source: JICA Study Team

Figure 2-3 Flow of Import Cargo

3. RESULT OF THE FIELD SURVEY

3.1 Summary of the Survey Result

The summary of the survey result regarding passenger service, ramp service, air cargo handling (import/export), customs, and immigration are shown in Table 3-1.

Table 3-1 Summary of the Survey Result

No.	Survey		Weekday/end	Content, Sample	Result (Average)
1	Passenger Service	Check-in Waiting and Processing Time	Weekday	Waiting Time: 11 flights, 120 samples	20.2 min
				Processing Time: 11 flights, 120 samples	3.2 min
			Weekend	Waiting Time: 15 flights, 108 samples	24.1 min
				Processing Time: 15 flights, 108 samples	3.3 min
2	Passenger Service	Baggage Inspection and Boarding Pass Confirmation	Weekday	Waiting Time: 9 flights, 143 samples	10.7 min
				Inspection Time: 9 flights, 143 samples	2.8 min
			Weekend	Waiting Time: 8 flights, 9 samples	9.8 min
				Inspection Time: 8 flights, 109 samples	2.2 min
3	Ramp Service	Passenger Arrival Time	Weekday	PBB Spot 9 flights	4 min
				Remote Spot 1 flight	12 min
			Weekend	PBB Spot 9 flights	4 min
				Remote Spot 5 flights	13 min
4	Ramp Service	Baggage Returning Time	Weekday	Time until the first baggage is brought to the BHS: 17 flights	27 min
				Total time until all the baggage were returned: 17 flights	28 min
			Weekend	Time until the first baggage is brought to the BHS: 16 flights	24 min
				Total time until all the baggage were returned: 16 flights	37 min
5	Air Cargo Handling (Import)	Cargo Concealing Time from Aircraft Arrival to the Warehouse	Weekday	Processing Time: 21 flights	1hour 37 min
			Weekend	Processing Time: 10 flights	
6	Air Cargo Handling (Import)	Processing Time from Entering the Warehouse to Customs Registration	Weekend	Processing Time: 250 samples	3.4 day
7		Processing Time from Customs Registration to Customs Clearance	Weekday	Processing Time: 800 samples	2.4 day
			Weekend	Processing Time: 400 samples	
8		Processing Time from Customs Clearance to Exit the Warehouse	Weekday	Processing Time: 800 samples	40 min
9	Weekend		Processing Time: 400 samples		
10	Air Cargo Handling (Export)	Cargo Concealing Time from Track Arrival to the Warehouse	Weekday	Processing Time: 4 samples	6 hour 38 min
			Weekend	Processing Time: 5 samples	
11	Air Cargo Handling (Export)	Waiting Time from entering the Warehouse to Start Building-Up	Weekday	Processing Time: 10 samples	5 hour 53 min
			Weekend	Processing Time: 110 samples	
12	Air Cargo Handling (Export)	Processing Time of Building-Up	Weekday	Processing Time: 210 samples	3 hour 8 min
			Weekend	Processing Time: 110 samples	
13	Air Cargo Handling (Export)	Cargo Concealing Time from Warehouse to the Aircraft	Weekday	Processing Time: 11 flights	10 hour 58 min
			Weekend	Processing Time: 10 flights	
14	Immigration and Customs	Processing and Waiting Time of Departure and Arrival Immigration	Weekday	【Departure】 Waiting and Processing Time: 222 samples	5.8 min
				Processing Time: 44 samples	2.0 min
				【Arrival】 Waiting and Processing Time: 450 samples	6.3 min
			Weekend	Processing Time: 103 samples	3.5 min
				【Departure】 Waiting and Processing Time: 121 samples	8.3 min
				Processing Time: 121 samples	2.5 min
Weekend	【Arrival】 Waiting and Processing Time: 141 samples	7.7 min			
	Processing Time: 141 samples	2.8 min			
	15	Immigration and Customs	Processing Time of Passenger Export/Import Customs Clearance	Weekday	【Export】 Not conducted at HSIA
【Import】 Processing Time: 146 samples					2.5 min
Weekend				【Export】 Not conducted at HSIA	N/A
				【Import】 Processing Time: 132 samples	2.1 min

Source: JICA Study Team

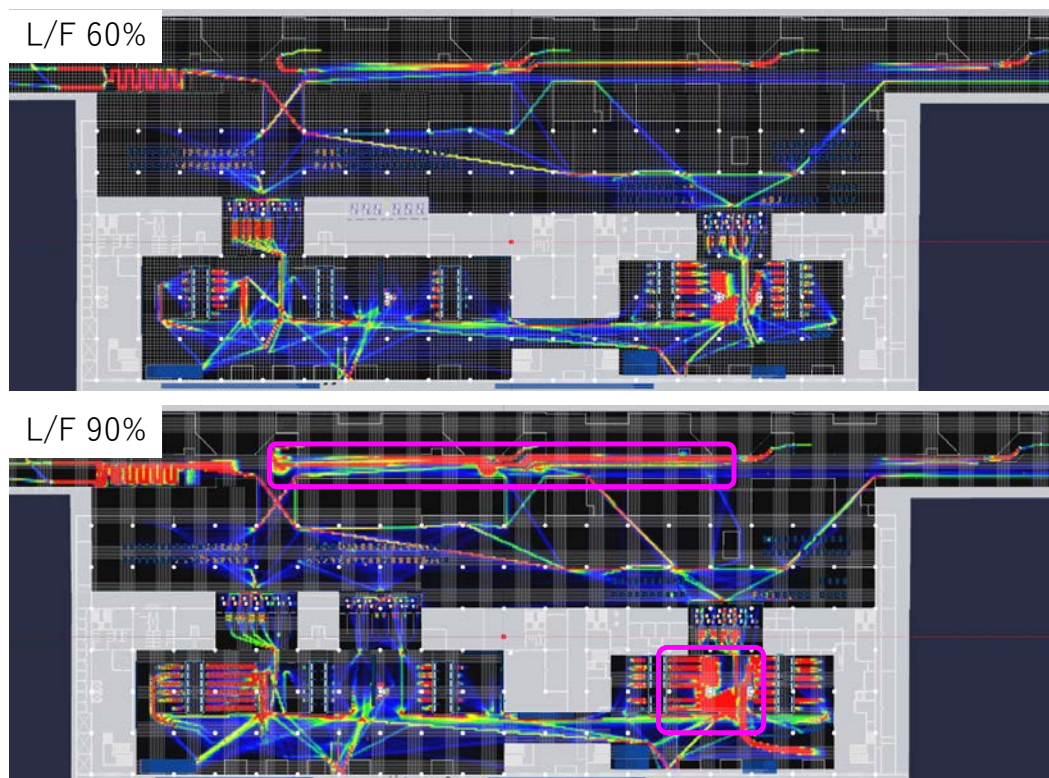
3.2 Simulation Analysis

(1) Objective

The objective of this analysis is to propose an effective measure towards the current problems regarding passenger service in HSIA by assessing the current facility operation capacity and service level via Comprehensive Airport Simulation Technology (CAST), a simulation software that specializes on airport operation.

(2) Summary of the Analysis Result

When the load factor was increased from 60% to 90%, higher passenger passage frequency was confirmed between Row D and Row E and in the concourse in front of the security control. Both locations intersect the passenger flow lines, which is likely to be the main factor generating congestion.



Source: JICA Study Team

Figure 3-1 Comparison of Load Factor 60% and 90% (Departure)

The guidelines for improving the level of service (LoS) were organized as follows. In addition, the tendency of the LoS of each processing facility at HSIA (in the case of the load factor of 90%) was sorted as shown in Figure 3-3 based on the LoS chart. (*reference). When comparing the LoS of the load factor of 60% to 90%, the deterioration of the baggage inspection and the baggage claim was confirmed in the Space LoS, and the check-in counter as well as the immigration procedure deteriorated in the Maximum Waiting Time LoS. When LoS is evaluated on two axes, it turns out that there is a possibility that LoS may deteriorate to more than Sub-Optimum in procedures other than the departure procedures.

L/F 60% Case	Space	Max Waiting Time	LoS Total
Check-in Counter	OVER-DESIGN	OVER-DESIGN	OVER-DESIGN
Immigration(Dep)	OVER-DESIGN	Optimum	Optimum
Security Control	OVER-DESIGN	SUB-Optimum	SUB-Optimum
Immigration(Arr)	OVER-DESIGN	Optimum	Optimum
Baggage Reclaim	OVER-DESIGN	SUB-Optimum	SUB-Optimum

Source: JICA Study Team

Figure 3-2 LoS Trend of Processing Facilities (Load Factor: 60%)

L/F 90% Case	Space	Max Waiting Time	LoS Total
Check-in Counter	OVER-DESIGN	SUB-Optimum	SUB-Optimum
Immigration(Dep)	OVER-DESIGN	Optimum	Optimum
Security Control	SUB-Optimum	SUB-Optimum	UNDER-PROVIDED
Immigration(Arr)	OVER-DESIGN	SUB-Optimum	SUB-Optimum
Baggage Reclaim	SUB-Optimum	SUB-Optimum	UNDER-PROVIDED

Source: JICA Study Team

Figure 3-3 LoS Trend of Processing Facilities (Load Factor: 90%)

(3) Result of the Analysis

1) Creating the Flight Assignment Table

Create the Flight Assignment Table Rule and as the basis for the creation of the Flight Assignment Table, both for the check-in counter and the security gate. Perform operations so as to avoid passenger show-up overlaps or concentration immediately before the flight.

2) Improving the Check-in Process

At the check-in counter, changing the queue from a single queue to a snake queue and reducing dead space are some of the effective methods for optimizing LoS.

In addition, the administrator side of the check-in area should clarify and present the area for locating the queue of each row. Each airline should operate with the goal of satisfying this rule, which is already confirmed as an effective measure for controlling congestion in the airport. In addition, evaluating the LoS based on this rule is also considered effective for improving the operation of each airline.

Regarding the processing time, about three and a half minutes for Bangladeshi airlines and about three minutes for foreign airlines are confirmed as one of the causes of the deterioration of LoS. Therefore, improvement is considered necessary.

3) Effective Operation of the Immigration Area

The operation of Immigration Entrance 02 is currently conducted at the time of congestion in the departure immigration. However, knowing the tendency of conducting the timing for effective use of Immigration Entrance 02 shall be analyzed based on the load factor percentage study derived from the passenger flow to avoid the bottleneck in immigration and to improve the LoS.

4) Shortening the Conveying Time of the Baggage from the Aircraft.

In the baggage claim process, it is understood that it is necessary to shorten the time from unpacking the cargo quickly after the arrival of the flight to the transportation of the first bag. It is also necessary to increase the processing capacity of the baggage transportation.

4. RESULT OF HEARING FROM COMPANIES

The summary of the results of the hearing is shown in Table 4-1.

Table 4-1 Summary of the Result of the Hearing

Item	Content
Indicated Matter	<ul style="list-style-type: none"> → Bonded warehouses are narrow (an average of three times wider than the present spaces are necessary for both export and import). → Export: There is not enough space for unloading of cargo. The common area is seriously congested. → Import: Cargo which cannot be accommodated in the warehouse is left unattended in open air under the canopy (non-bonded) near the ramp. → Although Biman Airlines is a monopoly and is favorably treated, it is not well managed in terms of cargo proficiency. → It was told that accidents involving a unit load device (ULD) directly hitting an aircraft occurred three times in the past three years due to an unsecured ULD or a ULD placed directly on the ground. → The damage compensation is substantially borne by the airlines. → The facility for courier cargo is poor. → Designated storage facilities for cargo that are unclaimed for a long time should be established outside of the bonded warehouse to ease up congestion. → Unreserved cargo placed in front of the export bonded warehouse should be placed outside of the airport (another idea is to transfer the cargo to the old bonded warehouse when the new bonded warehouse is completed). → Bonded cargo cannot be stored outside of the airport because the concept of bonded transfer is not established in Dhaka. → There is a shortage of customs officers (one officer processes hundreds of cases per day. In total, there are about 20 officers assigned in export and import). In addition, the knowledge of customs officers for HS code is insufficient. → The substantial office hours of the customs office are less than six hours due to late opening and prolonged lunch break, which should be allotted instead for facilitating moving out of cargo from the warehouse.
Issue	<ul style="list-style-type: none"> → Handling and storage spaces both in the export and import warehouses are too narrow. → Biman Airlines staff are unreliable when it comes to qualitative and swift handling because they do not undergo enough basic training, including safety management. → The contract of damage claim and loss between Biman Airlines and other airlines is unilateral for Biman Airlines. → An e-commerce business operator plans to use a courier service; therefore, the appropriate facility is necessary to increase future demand for the business and to develop the country through expansion of air trade e-commerce. → The concept of bonded transfer is not yet established. → There is a shortage of customs officers (in total, there are only about 20 officers in export and import). → The knowledge of customs officers on HS number is insufficient. → The substantial office hours of the customs office are less than six hours.

HS code: Harmonized Commodity Description and Coding System

Source: JICA Study Team

5. CAUSE ANALYSIS

5.1 Other Airports and Airlines

The comparison of HSIA with Narita International Airport Terminal 3 and Chubu International Airport is shown in Table 5-1.

Table 5-1 Comparison of HSIA and Other Airports

Content	Finding from the Comparison
Scale of Airport Facilities	When comparing the passenger terminal floor areas to the annual passenger numbers at the three airports (passenger terminal floor area/annual passenger numbers), the figures for HSIA are the same as those for the dedicated low cost carrier (LCC) terminal at Narita International Airport Terminal 3. However, we see that the floor area per passenger is less than that of the Chubu International Airport which chiefly serves full service carriers. Therefore, when viewed in terms of passenger services, the terminal floor area at HSIA is more confined than the area in the full service carrier terminal and can be described as having a compatible space usage ratio for LCCs such as the case of Terminal 3 at Narita.
Retailing	<p><u>Comparison of shop floor area and passenger terminal floor area</u> HSIA has a small retail floor area compared to Terminal 3 at Narita and Chubu International Airport. In addition, HSIA uses a fixed rent system. This indicates the likelihood that there is little understanding that increased floor area will contribute to increased revenue. In contrast, as was the case after privatization at Narita Airport, the use of a revenue-based commission type of rent system leads to the possibility of increasing non-aeronautical revenue by increasing floor area.</p> <p><u>Comparison of shop numbers and retail floor area</u> HSIA has less shops compared to Terminal 3 at Narita Airport and Chubu International Airport. Furthermore, there are not enough food and beverage outlets at HSIA because more floor area per shop is required. It is said that there is an allowance for increasing the number of shops and retail sectors to increase non-aeronautical revenue as mentioned above with regard to retail floor area.</p>
Providing Information to Passengers	<p><u>Number of passenger information counters</u> If the passenger terminal floor area at each airport is considered, HSIA is said to have a sufficient number of passenger information counters as compared to Terminal 3 at Narita and Chubu. However, because of the issues observed in Chapter 6, there is a need to review operating methods, to improve services provided by information staff among other service improvements, and in some cases, to add more passenger information counters as well as make other facility improvements.</p> <p><u>Number of Flight Information Display Screens (FIDS) units</u> Based on the passenger terminal floor areas at each airport, the number of toilets at HSIA is considered sufficient as compared to Terminal 3 at Narita and Chubu.</p>
Passenger Services	<p><u>Number of toilets</u> Based on the passenger terminal floor areas at each airport, the number of toilets at HSIA is said to be sufficient as compared to Terminal 3 at Narita and Chubu.</p> <p><u>Number of baggage carts</u> HSIA has a sufficient number of baggage carts for the number of passengers, but given the observations of the issues noted in Chapter 6, some discussion is needed on improvements to operating methods and holding locations.</p>

Source: JICA Study Team

5.2 Comparison with Other Airlines

(1) Comparison of Service Level

Service level field survey results at the HSIA are compared with the standards of Japanese airlines and IATA (LoS).

The results showed a lower service level compared with that of Japanese airline companies and IATA in terms of international check-in, security control, time required to return checked baggage, and ground support equipment (GSE) occupancy rate.

Table 5-2 Comparison of Service Level

		Field Survey Results at HSIA	LoS of Japanese Airlines	LoS of IATA
Passenger Service	International Check-in Waiting Time	Weekday: 20.2minutes Weekend: 24.1minutes	Within 15minutes	N/A
	International Check-in Process Time	Weekday: 3.2minutes Weekend: 3.3minutes	Within 2minutes	N/A
	International Check-in Total Time (Waiting+Process)	Weekday: 23.4minutes Weekend: 27.4minutes	Within 17minutes	10~20minutes
	Security Control	Weekday: 13.5minutes Weekend: 12.0minutes	N/A	5~10minutes
Immigration	Departure Immigration (Waiting+Process)	Weekday: 7.8minutes Weekend: 10.7minutes	N/A	5~10minutes
	Arrival Immigration (Waiting+Process)	Weekday: 9.8minutes Weekend: 10.5minutes	N/A	5~10minutes
Customs	Import Customs (Waiting+Process)	Weekday: 2.7minutes Weekend: 2.1minutes	N/A	1~5minutes
Ramp Service	Required time to return baggage	Weekday: 7.01seconds Weekend: 6.67seconds / per baggage	Within 5 seconds per baggage	N/A
	GSE occupancy rate	64.79%	Over 90%	N/A

Source: JICA Study Team

(2) Comparison of Handling Capacity:

The JICA Study Team compared the handling capacity per staff of the ground handling service (passenger service and ramp service). The value of annual handling per staff indicates the number of departing passengers. The handling capacity of Biman Airlines is compared with the extremely low handling capacities of Japanese airlines in Narita International Airport and Southeast Asia, which are "67.9%" and "63.0%", respectively.

Table 5-3 Comparison of handling capacity

Biman Bangladesh Airlines (At HSIA)	Japanese Airlines (At Narita Airport)	Japanese Airlines (At South East Asia)
929.7	1370.0	1474.8

Source: JICA Study Team

(3) OTP (On Time Performance)

The OTP of HSIA, Japanese international airports, and same-scale international airports were compared. The results are shown in Table 5.2-5. As shown in the table, the OTP is very low.

Table 5-4 Comparison of OTP with Other International Airports

		HSIA	Narita International Airport	Chubu International Airport	Yangon International Airport	Kolkata International Airport	Bandaranaike International Airport
Airport Facility Scale	Throughput	8 million	49.5 million	11 million	7 million	25 million	6 million
Handling Scale	Number of Departure and Arrival	38,118	251,639	50,701	41,961	71,415	33,585
Service Level	OTP	61.4%	82.9%	83.2%	81.3%	80.7%	84.6%

Source: JICA Study Team

(4) Cargo Processing Capability Comparison with Other Airports

The large-scale Narita Airport, the Haneda Airport (which has similar handling volume), and the Manila Airport in Asia were compared with HSIA. Person and area units versus annual international cargo tonnage are adopted for the comparison of processing capability.

As a result, the reason why the unit ton per person in HSIA is smaller than in other airports (productivity per person worth) is surmised due to human powered handling, which means electrical facilities and equipment are not utilized.

About 2,000 people are estimated to be engaged in cargo handling because it is unclear how many staff are assigned for cargo out of the total 5,400.

The reason for the comparatively high value of cargo tonnage per area (high productivity per area) is that the cargo that overflowed from the warehouse is also considered handled in the warehouse premises.

Table 5-5 Comparison with Other Airports (Cargo)

Airport	Annual Cargo Tonnage	Tonnage/Person	Tonnage/Area (m ²)
Narita Airport	2,140,075	1,192.6	8.4
Haneda Airport	457,540	696.3	26.0
Manila Airport	632,000	597.7	10.3
HSIA	284,000	142.0	10.2

Source: JICA Study Team

5.3 Cause Analysis

(1) Passenger Service

Biman Arilines is an IATA member airline. As a requirement for membership, Biman Arilines acquired an IATA Operational Safety Audit (IOSA) certificate and compiles and maintains such documents in the handling manual.

However, there is a concern for the discrepancy between conditions required by the manual and the actual condition. For example, the staffing rate (ratio of actual staffing divided by planned staffing) is about 50%. Considering that the Biman Arilines flight handling is carried out with 50% of the necessary number of staff, doubts arise regarding the authenticity of the original planned staffing number.

In addition, the check-in counters are not allocated in a pre-planned method, but in a rather unordered manner, on a first-come first-serve basis. With an absolute shortage of check-in counters for the number of flights and the number of passengers to be handled, it is necessary for Biman Arilines to devise a way to implement smooth and efficient operations under this difficult situation.

Delay in departure handling is caused by staffing shortage and lack of check-in counters. Delay in gate assignment causes delay in the start of gate security process. Delay in handling leads to flight delay. Consequently, delay in gate assignment of another flight would lead to further delays as well.

In order to escape from this vicious cycle, it is necessary to improve the OTP rate and to raise it to a normal handling level.

(2) Ramp Service

An airline's OTP impacts heavily on its operation. Foreign airlines that outsource handling to Biman Airlines may handle their flight by assigning their own staff independently to avoid the impact of Biman Airlines's staffing shortage for passenger services, but they have to rely on Biman Airlines handling for the ramp service because they do not own their own GSE.

Like passenger services, manpower is short. Furthermore, because of the lack of GSE, proper handling in both Biman Airlines and foreign airlines have yet to be provided.

Although replenishment is progressing according to the purchase plan of GSE, there are concerns that new products will become unserviceable in several years due to bad handling in everyday use.

The filling rate of the staffing is about 60% of the stipulated capacity. As with passenger services, there is doubt about the authenticity of the original capacity, causing a situation where the required staffing can not be secured.

Arrival and departure handling is delayed due to the lack of staffing and GSE. Delay in handling leads to flight delay and which further triggers another flight delay. In order to escape from this vicious cycle, it is necessary to improve the OTP rate and to raise it to a normal handling system.

(3) Cargo Handling

1) Import

- a) Generally, the responsibility demarcation between cargo terminal and ramp are divided from canopy of the warehouse where receiving of cargo is conducted. However, it is different for HSIA since cargos are out of ramp area due to the lack of cargo terminal capacity. Therefore, the responsibility is not clear since receiving confirmation won't be conducted when the ULD is reloaded from the aircraft, it will be sent to the ramp area instead of the cargo warehouse.
- b) Only a narrow passage is secured for hand trolleys to move under the canopy storage. Cargo storage is configured in a disordered manner, and cargo is placed directly on the floor where not enough space is secured for forklifts to move, such a situation forces human labor handling only.
- c) There is a refrigerator, but it is aged and small.
- d) Cargo location is controlled in a method which an outsider is unable to understand.

2) Export

- a) The waiting time for trucks to carry cargo into the warehouse is extremely long. This is evident especially in the unreserved cargo storage area which is essentially full, and the cargo cannot be unloaded unless other unreserved cargo is reserved and moved out. It takes a long time to unload cargo, sometimes becomes whole day.
- b) Export warehouse is divided into two parts, one is called the "RA3 area" and the other is called the "common area". Only Biman Airlines, Etihad Airways, and Saudi Arabian Airlines are allowed in the RA3 area. In the common area, the cargo of over 30 airlines are handled in this narrow space. However, the common area is usually very congested which makes it hard to secure space for building up the ULD.

3) Common Agenda

- a) Basic cargo handling rule such as "do not throw cargo" and "do not stamp on cargo" are not conformed.
- b) Cargo is not handled by forklifts and skid efficiently in an orderly manner like in Japan (There are forklifts, however the number of frequently used light weight forklifts is small and on the contrary, there are 8 heavy weight forklifts which is abnormal formation).
- c) Cargo staff appear to have lack of knowledge in safety and quality. Cargo handling is insufficient.
- d) The location for the pallet and skid storage is not fixed, and the items are scattered inside and outside of the warehouse.
- e) Lack of acknowledgement of the rapid growth of courier cargo coping with the explosive diffusion of e-commerce. The courier cargo facility is poor and has no advantages in clearing speed over normal cargo.
- f) There is no fixed storage facility for transit cargo.

- g) There is no car parking lot in the cargo area.

(4) Passenger Terminal Management

Issues regarding passenger terminal management are shown below:

- The survey focused on various aspects related to the management of passenger terminals.
- There was a lack of incentive for the airport to proactively manage tenants (and their sales) due to the underlying fact that operating charges in tenant contracts are based on fixed rents according to floor space.
- By switching the fixed rent to commission rent for sales, it is possible to make the sales improvement of the store the common interest of the airport and the tenants. With this, it is possible to establish the cycle of "store attraction → tenant management → sales promotion → attractive shop attraction".
- In terms of lease management, the inability of the Civil Aviation Authority of Bangladesh (CAAB) to collect facility usage charges from airlines for check-in counters is an issue.
- During the investigation to identify the problem, the management situation of the facility, which should be done orderly by the airport side, such as the check-in counter facility and the office room area is found to be undesirable.
- The first impression of the terminal services was that a certain level of cleanliness is maintained in the public passenger areas. However, even within the passenger terminal lobbies, there were inconceivable scenes in Japan, such as chairs and tables abandoned in less-visible areas and a cat found on the airside. Facilities such as information counters, smoking areas, and customer feedback boxes were limited compared to the scale of passenger terminals. The JICA Study Team would like to confirm the situation on-site and to identify potential improvements.
- The JICA Study Team will explore both short-term improvement plans that can be implemented within existing terminal operations, as well as long-term strategies that treat the opening of Terminal 3 as an opportunity for adopting new systems following its demarcation from existing terminals which will be discussed later.

(5) Terminal Facility Maintenance and Management

The issues regarding terminal facilities maintenance and management are shown below:

Although this was the first survey, the state of maintenance and management did not appear as bad as envisioned, as passenger areas seem to be thoroughly managed and maintained. The next survey will be conducted in June, following Ramadan. In addition to improvement suggestions, the JICA Study Team will survey identified areas that require further investigation. The survey will focus particularly on the state of the manuals (systematic maintenance of manuals), as well as determining whether maintenance and management are being conducted in a planned manner.

- Although there is awareness in improving passenger areas, including plans to install digital displays above all check-in counters next month, the cleaning and organization of other less-visible areas, such as machinery rooms, has been neglected and shows no indication of improvement.
- The terminals were extremely dirty five years ago, and passenger areas have greatly improved in the last 2 to 3 years (staff areas and other less-visible locations remain unclean).
- Realistically, it is considered difficult to implement drastic improvements or adopt new systems at Terminals 1 and 2. It would be advisable to first introduce new systems or major improvements in the new Terminal 3 facility.

- Without determining the handling (demarcation) of Terminals 1 and 2 following the opening of Terminal 3, it is considered difficult to judge whether investing on the improvement of these two terminals is appropriate. A prompt decision in the handling (demarcation) of Terminals 1 and 2 following the opening of Terminal 3 will be important.
- The JICA Study Team would like to explore possible low-cost improvements to the present state of Terminals 1 and 2 in order to boost operating, maintenance, and management capabilities, such as reviewing the management of tools, supplies, and wiring and establishing a centralized maintenance management that negates individual differences in levels (creating maintenance check sheets, etc.).
- Normally, the airlines using Terminal 3 would be determined from the design stage. Basing construction on specifications which incorporate the requests of airlines that will actually use the terminal makes it possible to minimize reworking and additions. Discussions with the airlines that will actually use the terminal are indispensable. As such, the CAAB should first explain the details of the facility and begin discussions with the airlines.
- Terminal 3 should also have new equipment, a review of operating systems, and new manuals. Familiarization training and relocation before the start-up and commissioning will be required. There is also a need to confirm the degree of understanding and capability with respect to the start-up and commissioning work of the CAAB.

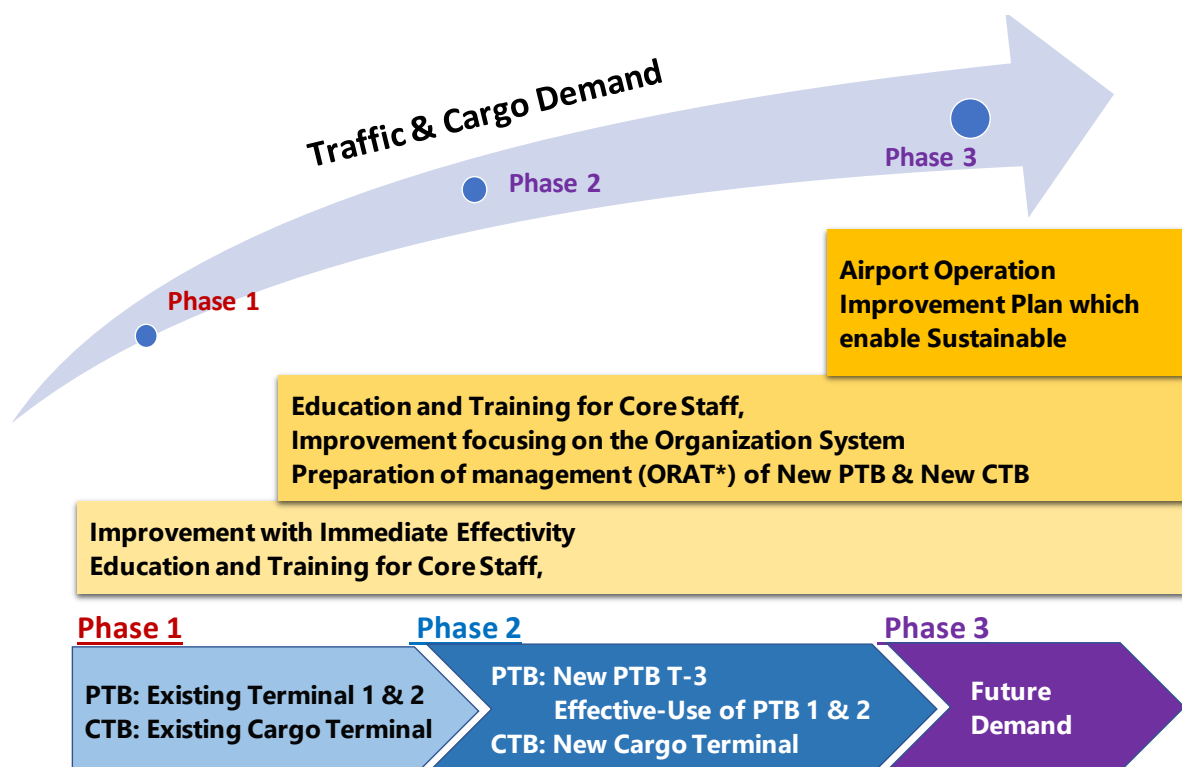
(6) Departure and Arrival Immigration, Customs

- Position changing policy at the immigration control office for fraud prevention hinders immigration inspection officers from acquiring skills that are required for immigration control work.
- The departure inspection area at the immigration hall is narrow and crowded. During peak hours, passengers are forced to wait outside the departure inspection area.
- In the immigration control, the operating system (OS) of the personal computer (PC) being used is "Windows XP". Windows XP is an OS with terminated support, so security is vulnerable.
- There are many Bangladeshi passengers who have incomplete entries in their departure documents at the immigration control. This takes unnecessary time for the review of these documents.
- Lastly, personnel shortage is caused by working conditions including wage level.

6. Improvement Proposal

6.1 Outline

The proposals for improvement will be given in this chapter, detailing the result of the study, and its consideration through five chapters. The phase planning concept of the operation improvement is shown in Figure 6-1. The improvement regarding the operation of existing facilities are categorized in phases, i.e., Phase 1 is for the improvement regarding the operation of Terminal 3, and Phase 2 is for the improvement of the new cargo terminal.



Source: JICA Study Team

Figure 6-1 Phase Planning Concept of Improvement in Operation

6.2 Improvement Plan for Existing Facilities (Phase 1)

(1) About Capacity Building Project

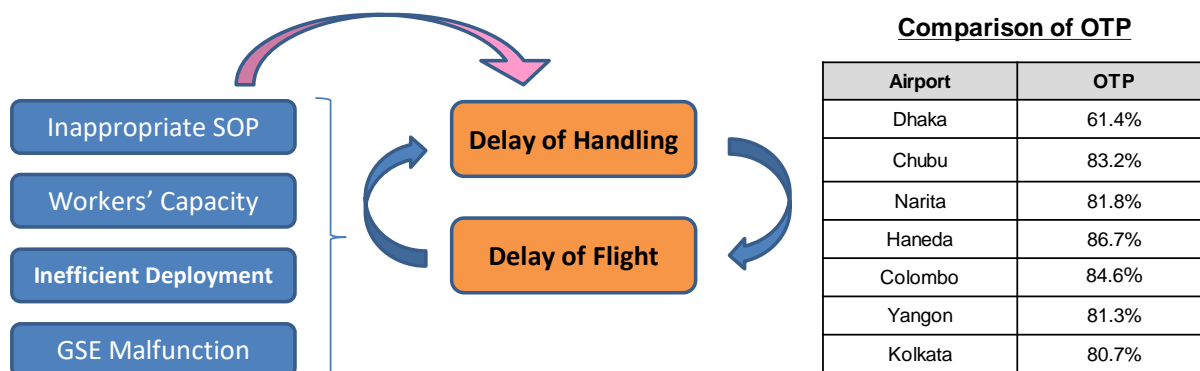
The supporting concept of capacity building project focuses on the major issues of ramp service (operation of GSE, maintenance of GSE) and cargo handling. are explained in the next section. Regarding the priority improvement proposals (Phase 1-2) introduced in section 6.2.1, ramp service and cargo handling were chosen since their priority are high and technical support are required.

(2) Improvement of Ramp Service (GSE Operation)

Regarding the On-time Performance (OTP) record, HSIA is about 60%, which is considerably lower than that of the same size airports and Japanese airports, whose record is about 80%.

The main cause of low OTP is inadequate SOP/manual, GSE shortage, inefficient allocation of GSE and frequent GSE failures.

Delays in ground handling in ramp service cause delays in other flights and thus fall into a vicious cycle that delay causes further delay.



Source: JICA Study Team

Figure 6-2 Issues and Cause Regarding Ramp Service

(3) Ramp Service (GSE Maintenance)

The GSE failure rate at HSIA is about 35% of the total, which is high compared to other airports. The main cause of the high GSE failure rate is as below.

- As the purchase procedure at Biman Airlines of the necessary parts for repair takes 6 months to 12 months, the repair period has been prolonged.
- Staff's knowledge and skills are short due to lack of training.
- Personnel shortage at Management level is more prominent than worker level at Airport Service Division. 35 management levels are required, but currently there are only 5 management. It is not an organizational structure that can provide appropriate maintenance planning, necessary instruction and judgment, and education for worker.

Regarding improvement proposals about OPT and GSE maintenance are explained in section 6.2.3 "Concept of Capacity Building Project."

(4) Improvement of Cargo Handling

As the results of survey, high priority proposal in Phase 1 (present facility) required are Safety, Quality and Efficiency of cargo handling. Actions required for new cargo terminal are categorized in Phase 2.

1) Safety

To propose implementation of comprehensive measures to reduce the number of accidents in the Export and Import Warehouse because 74 times accidents occurred in the warehouse in the past five years (Source: Biman Airlines) and lack of consideration of safety handlings are observed during JICA survey.

2) Quality

To propose implementation of comprehensive measures such as to allocate frontline instructors who diffuse basic cargo handling rules to all cargo staff because missing cargo is reported several times by Japanese forwarders in unorganized work area.

3) Efficiency

To propose implementation of comprehensive measures to improve work environment, education and training of all frontline cargo staff because the processing speed of cargo handlings are mostly slow compare to Japan and human labored work will be an essential part in Phase 2.

4) Required Time for Customs Clearance

To propose Customs office to develop and allocate necessary number of revenue officers appropriate to on-site workload and open office in conformity with officially announced office hours because those issues are pointed out by airport users

(5) Work flow of Improvement Proposal

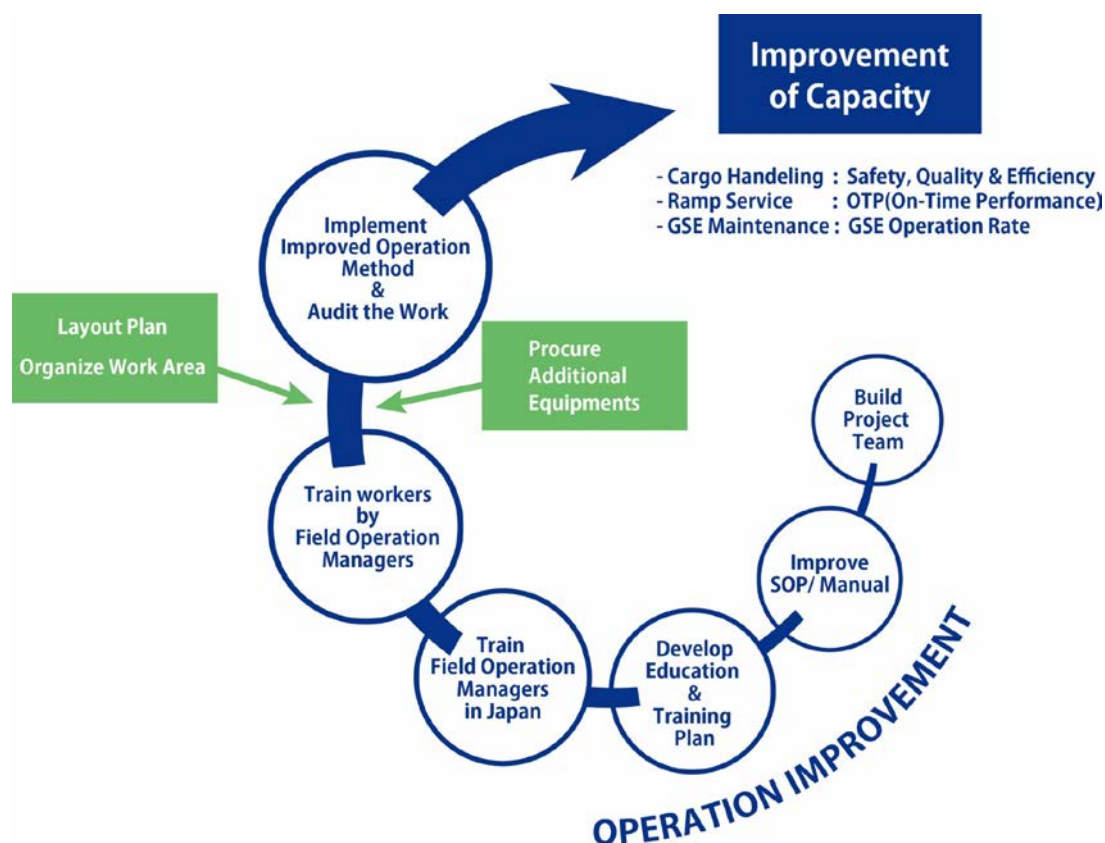
In response to the above issues, we propose an improvement plan comprising of six steps. First, i) there will be an improvement of the project team's composition and ii) a revision of the current SOP and manual up to the working level. Next, iii) education curriculum planning such as basic education and qualification management in frontline, and improvement of education and guidance system will be performed.

Partly in parallel, iv) training and lectures in Japan for site work instructors and ensuring the direction for improved frontline operation by having the trainee experience cutting-edge operations will be done. After that, v) implementation of the “what is learned on-site” of the work instructors will be created based on their experience in Japan, the SOP, the manual, and the education curriculum.

In parallel with this, planning the necessary equipment (implementation of equipment procurement as necessary), revision of the layout plan, and implementation of the organized plan should be done.

Based on the above, vi) carrying out the improved operation policy in line with work should be done. In addition, it is aimed to independently monitor the work for the purpose of continuous improvement, aiming for a system that can be monitored and improved.

Figure 6-3 shows the image of the workflow of operation improvement.



Source: JICA Study Team

Figure 6-3 Workflow of Operation Improvement

(6) Improvement Plan (Phase 1-1)

The simplified project design matrices are shown in Table 6-1 and Table 6-2. The specific activities regarding ramp service, GSE, and cargo handling will be conducted in Phase 1-1 and will be introduced in the next section.

Table 6-1 Simplified Project Design Matrix (1/2)

Narrative of Summary	Objectively Verifiable Indicators
Overall Goal	Indicators of project goals
Ground Handling Capacity of Biman Bangladesh is improved	1 On Time Performance (OTP) will be improved 2 GSE serviceable ratio will be improved 3-1 Number of accident in cargo warehouse should be decreased (Safety). 3-2 Number of lost/damaged cargo should be decreased (Quality). 3-3 Processing Time for Import/Export will be shortened (Efficiency).
Output (main items to achieve the project goal)	Output indicators (results obtained as a result of each activity)
1. Ramp Service Capacity of Biman Airlines is improved	1-1 Project team has been built. 1-2 Modified SOP/work schedule for each equipment/manpower and equipment location plan/safety management plan/GSE inspection routine plan are executed. 1-3 Curriculum of basic education and guidance system have been formulated. Filed operation managers have been developed able to instruct employees. 1-4 Ramp service quality knowledge learned in Japan through management classes are shared with other management classes. 1-5 Over 80% of all employees will have taken the basic education. 1-6 Ramps and container yards are organized and arranged. 1-7 Necessary equipment is reviewed and replenished. 1-8-1 Over 70% of flight handling is completed before the time indicated in the ramp work table, excluding flights with inevitable reason. 1-8-2 Daily routine inspection methods for GSE are formulated. More than 80% of the inspections are implemented based on these methods.
2. GSE Maintenance Capacity of Biman Airlines is improved	2-1 Project team constitution is improved. 2-2 Maintenance plan, inspection item, maintenance record management analysis method and maintenance method for GSE are formulated. 2-3-1 Curriculum of basic education and guidance system have been formulated. Filed operation managers have been developed able to instruct employees. 2-3-2 Qualification management plan is executed, and the number of qualified holders is increasing. 2-4 GSE maintenance technology mastered through OJT in Japan through management classes are shared with other management classes. 2-5 Daily inspection methods for GSE are formulated. More than 80% of the inspections are implemented based on these methods. 2-6 GSE hanger are organized and arranged. 2-7 Necessary equipment is reviewed and replenished. 2-8 The GSE has been regularly maintenance according to the plan. Maintenance time is reduced by 20% and the quality is maintained.
3. Cargo Handling Capacity of Biman Airlines is improved	3-1 Project team for improvement plan has been set up. 3-2 Modified version of SOP has been prepared and the consciousness of safety/quality/efficiency has been pervading to cargo staff. 3-3 Curriculum of basic training system has been formulated and frontline supervisor instructs cargo staff. 3-4 Instructors who were trained in overseas share experience and knowledge with other cargo staff. 3-5 Handling layouts of export and import warehouse has been reviewed for moving cargo smoothly in the warehouse. 3-6 Facility and required number of equipment has been reviewed and replenished for efficient cargo handling. 3-7 Cargo has been handled according to manuals and external audit has been held regularly.

Source: JICA Study Team

Table 6-2 Simplified Project Design Matrix (2/2)

Activities(Activities by Biman Airlines to accomplish Outputs with cooperation of JICA Specialists)	Inputs
1 Improve Ramp Service Ability	Bangladesh side Inputs
1-1 Build a project team.	Counterpart
1-2 Improve SOP, work schedule, safety management and daily inspection plan.	<ul style="list-style-type: none"> • Project Director (CAAB/Biman Airlines Assumed)
1-3 Develop education curriculum and license management.	<ul style="list-style-type: none"> • Project Manager (CAAB/Biman Airlines Assumed)
1-4 Train filed operation managers in Japan.	<ul style="list-style-type: none"> • Cargo Handling Team (Biman Airlines Assumed)
1-5 Train workers by filed operation manager.	<ul style="list-style-type: none"> • Ramp Handling Team (Biman Airlines Assumed)
1-6 Organize ramp area and container yard.	<ul style="list-style-type: none"> • GSE Maintenance Management Team (Biman Airlines Assumed)
1-7 Procure additional ramp handling equipment.	
1-8 Improved implementation of ramp handing operations and audit work.	Equipment (to be discussed)
	<ul style="list-style-type: none"> • Passenger Step Car (Wide Body) • Delivery Car (Pick Up Track) • Flush Car (Lavatory Service Car) • Water Car • Baggage Cart • Belt Loader Car • Main Deck Loader (MDL) • Tow Tractor (TT) • Pallet Dolly
2 Improve GSE Maintenance Management Ability	
2-1 Build a project team.	Others
2-2 Improve maintenance plan, inspection item and analysis method of maintenance record.	<ul style="list-style-type: none"> • Project Office
2-3 Develop education curriculum and license management.	<ul style="list-style-type: none"> • Project Operating Cost
2-4 Train filed operation managers in Japan.	
2-5 Train workers by filed operation manager.	Japan side Inputs
2-6 Organize GSE hangar area.	Specialist
2-7 Procure additional GSE maintenance equipment and repair parts.	<ul style="list-style-type: none"> • Chief Advisor
2-8 Improved implementation of GSE maintenance operations and audit work.	<ul style="list-style-type: none"> • Import Air Cargo Specialist • Export Air Cargo Specialist
3 Improve Import and Export Air Cargo Handling Capacity	<ul style="list-style-type: none"> • Ramp Service Specialist (Safety & Quality)
3-1 To set up a project team.	<ul style="list-style-type: none"> • Ramp Service Specialist (Handling)
3-2 To modify SOP (Standard Operating Procedure) for cargo handling.	<ul style="list-style-type: none"> • GSE Maintenance Management Specialist
3-3 To develop education curriculum.	<ul style="list-style-type: none"> • Organization / Institution / Education
3-4 To train filed frontline instructors in Japan or other countries.	
3-5 To train cargo staff by filed frontline team leader.	Training in Japan
3-6 To review the layout of cargo terminal.	<ul style="list-style-type: none"> • Air Cargo Handling Training
3-7 To procure necessary cargo handling equipment.	<ul style="list-style-type: none"> • Ramp Service Training
3-8 To handle cargo according to manuals and external audit holds regularly.	<ul style="list-style-type: none"> • GSE Maintenance Management Training

Source: JICA Study Team

6.3 Supporting Proposal for ORAT

(1) Necessary Prerequisites to Conduct ORAT

Operational Readiness Activation and Transition (ORAT) is a procedure of preparation, operation, and movement from the previous facility to the latest facility. The succession of operation such as facilities, systems and staffs from the previous facilities are required with regard to the opening of the passenger terminal 3 and new cargo terminal.

The contents of ORAT will be categorized to 7 sections which are shown below:

- a) Organizational Planning
- b) Operations and maintenance (preparation of manuals, etc.)
- c) Setting and notification of charges
- d) Coordination with airlines and government (CIQ, ATC, etc.)
- e) General familiarization training
- f) Relocation planning through relocation operation
- g) Problem Handling after Commissioning

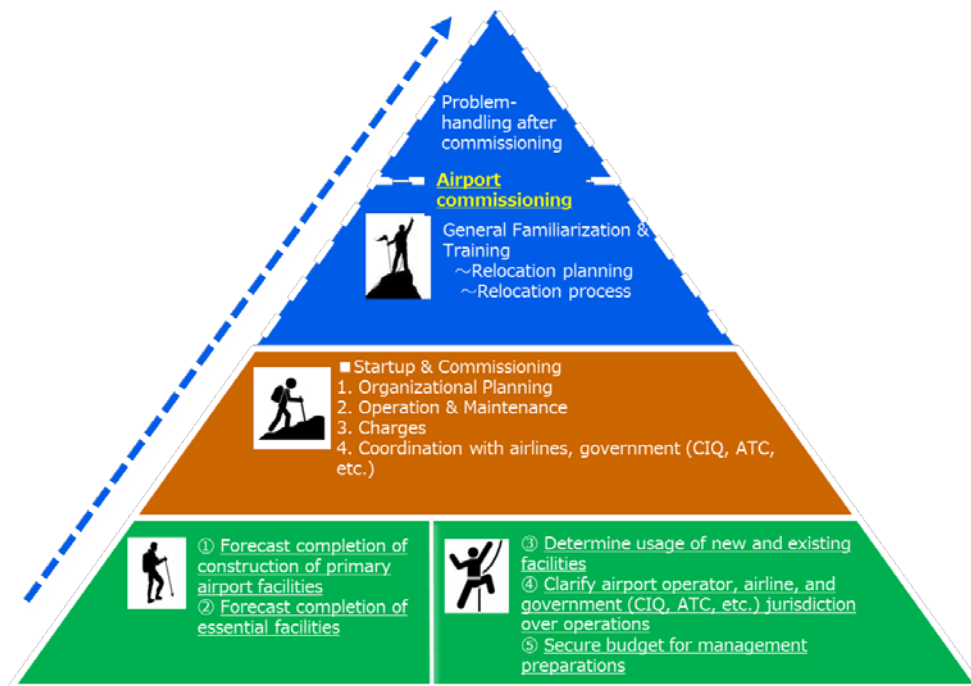
Especially for the operating airport, careful preparation is required since it is important to smoothly move to the new facility without stopping the aircraft operation while keeping in mind passenger safety and comfort.

(2) Proposal for Start-Up and Commissioning of Terminal 3 and New Cargo Terminal at HSIA

The fields of technical support for T3 and new cargo terminal are shown below;

- a) Tenant management
- b) Customer satisfaction improvement
- c) Terminal facilities maintenance management
- d) Terminal relocation
- e) Aviation security
- f) Cargo

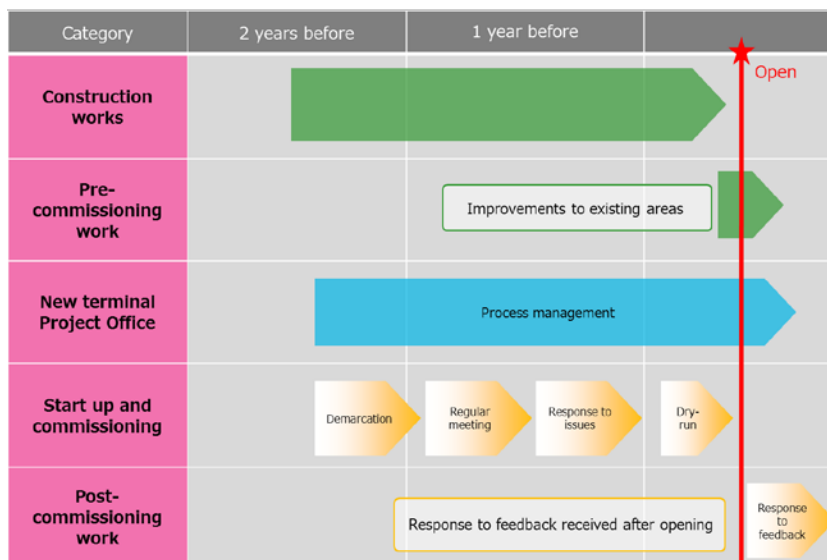
Under this project, the support will be provided for the expansion of HSIA tailored to local requirements with action plans for the relocation from existing facilities and for the commissioning of the new facilities, and also provide support for personnel training regarding the concept shown in Figure 6-4.



Source: JICA Study Team

Figure 6-4 Start-up and Commission Activity

Regarding the conduction of ORAT, the detailed plan should be considered based on the schedule of the expansion project of HSIA and the facility/equipment contents. The ORAT process should be started at least two years before the operation, considering the example conducted in the past. Figure 6-5 shows the road map to commissioning.



Source: JICA Study Team

Figure 6-5 Road Map to Commissioning

6.4 Entrusting the Airport Operation to the Private Sector

It is a custom in Bangladesh that airlines that commission Biman Airlines to conduct ground handling of their aircraft shall take responsibility of outsourcing. On the other hand, Biman Airlines is responsible for its operation. Furthermore, the airlines are demanding safe handling, high quality handling, and suitable cost from the outsourced ground handling company. It is common for international airports to let multiple private companies compete with each other to fairly satisfy the requests and to result to good effects not only to the airline but also to the airport operators and passengers.

In other airports, there are multiple private ground handling companies in operation. A few examples are shown in Table 6-3.

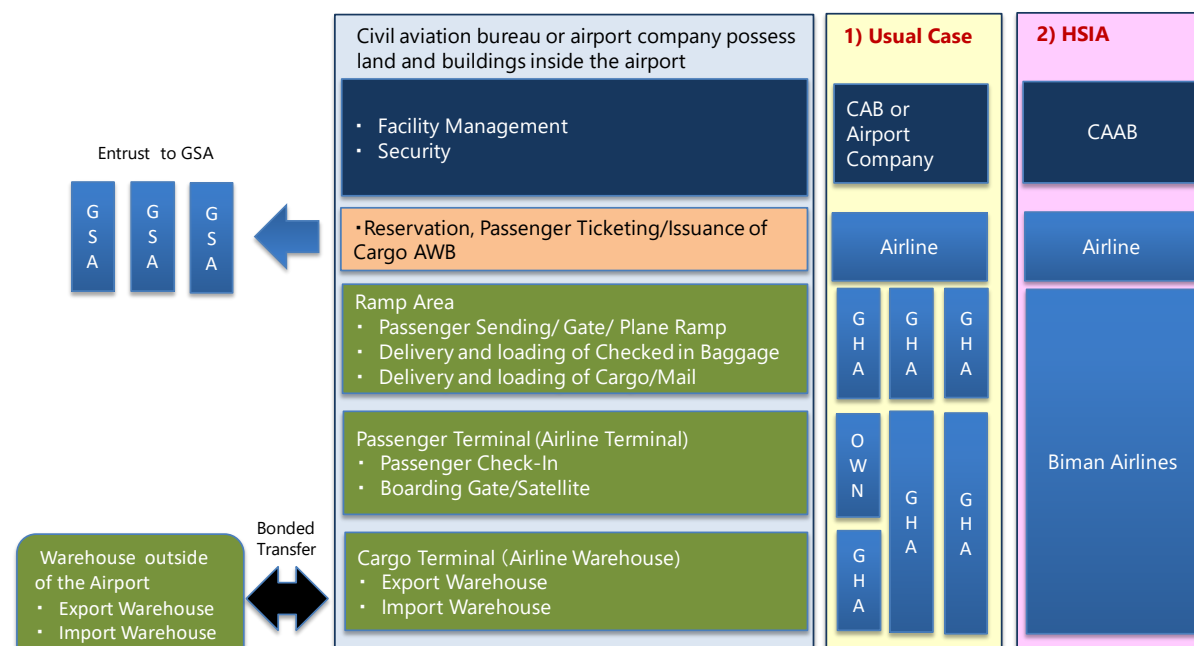
Table 6-3 Number of Private Ground Handling Company at the Other Airports

Airport	Suvarnabhumi Airport	Ninoy Aquino Airport	Narita Airport	Chubu Airport
Location	Bangkok	Manila	Narita	Nagoya
Ground Handling	2 leading private companies	4 leading private companies	3 leading private companies (including cooperative companies, it will be 60)	4 leading private companies
Cargo Terminal	2 leading private companies	3 leading private companies	4 leading private companies	4 leading private companies

Source: JICA Study Team

In most of the airports, airline can choose GHA (Ground Handling Agent), e.g., Chubu airport smaller than HSIA has four GHAs. GHA companies develop safety, quality and fare price through friendly competition. As a result, passengers and cargo users of the airport benefit comfort, friendliness and convenience which mechanism sharpens competitive edge of world airports.

However, in HSIA, this mechanism does not work and that becomes obstacle for growth. When Biman Airlines becomes competitive through JICA technical cooperation, it supposed to allow entry of GHA for the brilliant future growth of HSIA.



Source: JICA Study Team

Figure 6-6 Number of Private Ground Handling Company at the Other Airports

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ABBREVIATIONS

ACM	Aircraft Movement
ADB	Asian Development Bank
AGL	Aeronautical Ground Lighting
ALS	Approach Lighting System
AOC	Airline Operator's Committee
ASYCUDA	Automated System for Customs Data
ATA	Actual Time of Arrival
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
ATD	Actual Time of Departure
ATM	Air Traffic Management
ATS	Air Traffic Service
AWB	Air Waybill
BAFFA	Bangladesh Freight Forwarders Association
BATC	Bangladesh Airlines Training Center
BDT	Bangladesh Taka
BG	Biman Bangladesh Airlines
BHS	Baggage Handling System
BPP	Boarding Pass Printer
BRTA	Bangladesh Road Transport Authority
BSMIA	Bangabandhu Sheikh Mujib International Airport
BTP	Baggage Tag Printer
CAAB	Civil Aviation Authority, Bangladesh
CAT	Category
CIQ	Customs, Immigration, Quarantine
CNF	Local Name of Customs Broker
CRT	Crisis Response Team
CS	Customer Satisfaction
CUSS	Common Use Self Service
CUTE	Common User Terminal Emulation
DCS	Departure Control System
DFR	Draft Final Report
DOM	Domestic
EPZ	Export Processing Zone
FAA	Federal Aviation Administration
FIDS	Flight Information Display System
FOD	Foreign Object Damage
GoB	Government of Bangladesh
GPU	Ground Power Unit
GSE	Ground Service Equipment
HAWB	House Air Way Bill
HSIA	Hazrat Shahjalal International Airport
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization

ID	Identification
IMM	Immigration
INT	International
JICA	Japan International Cooperation Agency
JPY	Japan Yen
LL	Local Lost and found
LoS	Level of Service
MoCAT	the Ministry of Civil Aviation and Tourism
mppa	Million Passenger Per Annual
OTP	On Time Performance
PAX	Passenger
PBB	Passenger Boarding Bridge
PIR	Property Irregularity Report
PTB	Passenger Terminal Building
R/W	Runway
SITA	Société Internationale de Télécommunications Aéronautiques
STA	Schedule Time of Arrival
STD	Schedule Time of Departure
TFT	Task Force Team
T/W	Taxi Way
TWR	Tower
ULD	Unit Load Device
VIP	Very Important Person
VOA	Visa On Arrival
WMS	Warehouse Management System

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Chapter 1 Introduction

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CHAPTER 1 INTRODUCTION

1.1 Background of the Survey

In recent years, the economy of Bangladesh has experienced an annual average growth of more than 6%. Thus, the number of passengers in Hazrat Shahjalal International Airport (HSIA), which is one of the main entry points to the country, has increased at an average rate of 10% per year. In 2017, the total number of passengers was 7.7 million (international: 6.5 million, domestic: 1.2 million). Based on the annual departure and arrival statistics, the total number of aircraft movement is 87,000 (i.e., international: 47,000, domestic: 40,000). Thus, HSIA is an infrastructure that has a significant role in enhancing the social economy of the country.

The volume of cargo is also increasing at an average rate of 10.4% per year. In 2016, HSIA was handling 284,000 tons of cargo (international: 282,000 tons, domestic: 2,000 tons). In comparison with the Chubu Airport which handles 160,000 tons and the Haneda Airport which handles 340,000 tons, it is clear that HSIA is handling a proximate large volume of cargo to the said airports in Japan.

Currently, airport operation is inefficient due to the defective operation system and the incompetent staff. Moreover, passenger service level is low because of problems such as long waiting times for check-in and baggage inspection and delay of departure caused by setbacks in ground handling. There are also serious problems regarding air cargo handlings, like damaged cargo since airport personnel could not control the increasing number of cargo, and a massive amount of cargo are not stored inside the cargo terminal but left out in the open.

Furthermore, airport operations must be urgently improved since the airport expansion is on the account of the Japanese Official Development Assistance (ODA) loan projects, which aim to provide the new passenger terminal building (T3) and the cargo terminal in HSIA.

It is therefore necessary to consider a measure by identifying and analyzing problems regarding airport operation in HSIA.

1.2 Objectives of the Survey

The main objective of this study is to find the potential need for Japanese support by conducting a field survey as given below, and to consider a measure for each of them to improve HSIA operation.

- Improve Passenger Service for International Flights
- Ramp Service (Ground Handling, etc.)
- Air Cargo Handling
- Terminal Management
- Operation and Maintenance of the Facilities
- Departure/Arrival Immigration and Customs

1.3 Classification of Service Regarding Airport Operation

The classification of service regarding airport operation are shown in Table 1.3-1.

Table 1.3-1 Classification of Service Regarding Airport Operation

Large Item	Middle Item	Contents
Operation of Passenger Terminal	Passenger Terminal Building Management	<ul style="list-style-type: none"> • Tenant Management • Lease Management • Terminal Service (Service Facility Management) • Car Parking Management • CS Promotion • Commission Management such as Cleaning
	Passenger Terminal Facilities Managing and Maintenance	<ul style="list-style-type: none"> • Management (Work, Energy, Administration, Contact & Adjust, Book, Data and Document) • Monitoring (Operation) • Security (Emergency Treatment, Temporary Inspection, Patrol) • Inspection (Daily Inspection, Regular Base Inspection, Precise Inspection, Legal Inspection, Adjustment, Supply, Painting, Cleaning, Part Replacement), etc. • Waste Treatment
Ground Handling	Ramp Service	<ul style="list-style-type: none"> • Marshalling (Guiding aircraft to the spot) • Spot-in of the aircraft • Pushing Back of the aircraft (Back the aircraft using GSE) • Toeing if the Aircraft (Move the Aircraft by Toeing Tractor) • Mounting and Removing Operation of PBB • Operation of Passenger Step Vehicle • Mounting and Removing Operation of Passenger Aircraft Door • Electricity Supply • Operation of Air Conditioner for Passenger Cabin • Lavatory Service • Water Service • Operation of Door for Cargo • Loading Hand Baggage and Cargo on the Aircraft • Transferring Hand Baggage and Cargo • Sorting of Hand Baggage • High Pressured Oxygen Supply • Oil Supply for the aircraft • Watching the Wingtip of Aircraft • Interphone Service (Commuting with crew)
	GSE Maintenance	<ul style="list-style-type: none"> • GSE Maintenance
	Passenger Service	<ul style="list-style-type: none"> • Check In • Baggage Handling • Gate Service • Transfer Service • Lounge Service • Support for the Handicapped • Arrival Procedure • Returning Hand Baggage • Lost & Found
	Cargo Handling	<ul style="list-style-type: none"> • Acceptance and Delivery of Cargo and Mail • Handling in the Warehouse
	Flight Operation	<ul style="list-style-type: none"> • Flight Management • Flight Operation Support • Handling Control • Load Control
	Passenger Cabin Service	<ul style="list-style-type: none"> • Cleaning Inside of Aircraft • Catering (Loading Inflight Meals and Drinks) • Loading of Goods for Passenger Cabin

Source: JICA Study Team

1.4 Location of the Survey Area

The target of this survey is HSIA, which is located in the capital city of Bangladesh. The survey area is shown in Figure 1.4-1.



Source: JICA Study Team

Figure 1.4-1 Location Map of the Survey Area

1.5 Target Facility of the Study

The target facilities of this study are the international passenger terminal building, the domestic passenger terminal building, the import cargo terminal building, the export cargo terminal building, and other facilities related to the airport operation currently being surveyed. The layout of target facilities in HSIA is shown in Figure 1.5-1.

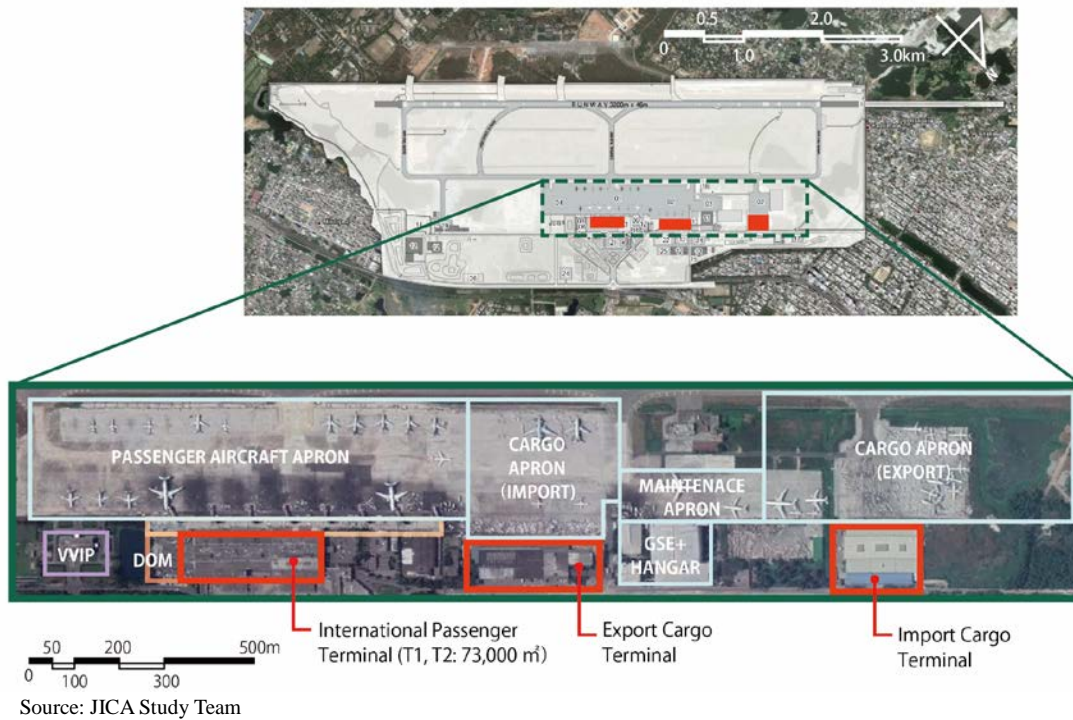
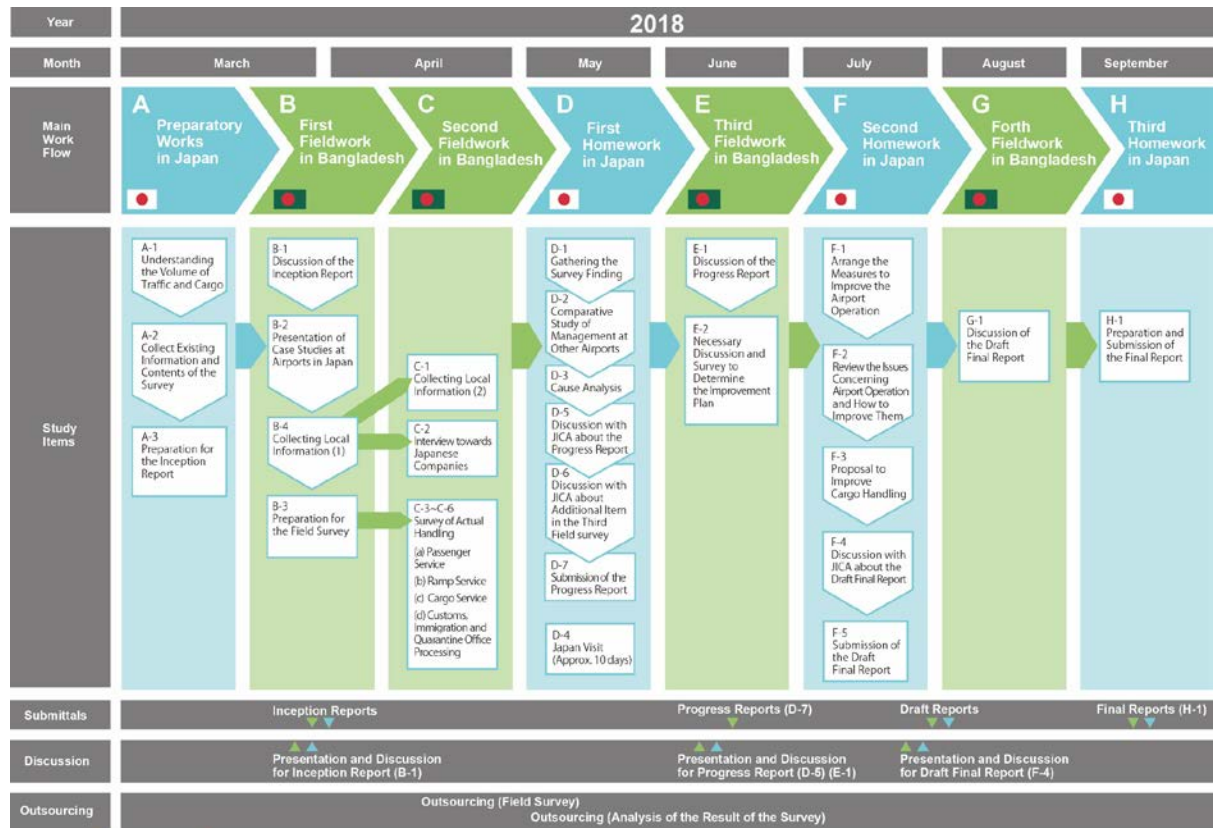


Figure 1.5-1 Plan of HSIA (Aerial Photograph)

1.6 Workflow of Overall Study

The study starts in March 2018 and will be completed in September 2018 upon submission of the final report. The overall schedule and detailed workflow of the study are shown in Figure 1.6-1.



Legend ▲ : Bangladesh ▲ : Japan
Source: JICA Study Team

Figure 1.6-1 Workflow of the Study

Chapter 2 General Information

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CHAPTER 2 CURRENT CONDITION

2.1 Outline

In this chapter, essential information about related organizations and traffic volume were collected from existing information and the result of the interview survey.

2.2 Related Organization

2.2.1 Ministries and Administration Agency

Bangladesh government consists from 58 administrative agencies shown in Table 2.2-1.

Table 2.2-1 Ministries and Administrative Agencies in Bangladesh

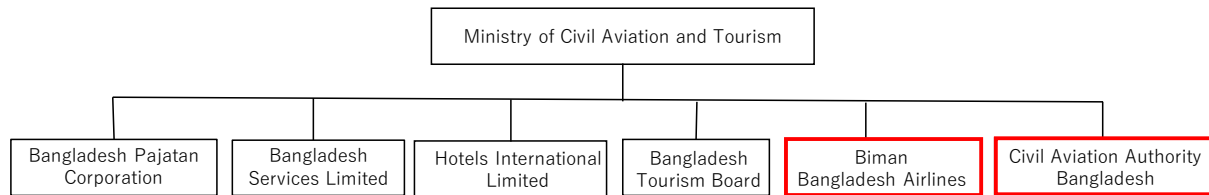
No	Ministry	Administrative Agency	No	Ministry	Administrative Agency	
1	President's Office	Public Division	30	Ministry of Commerce		
2		Personal Division	31	Ministry of Road Transport and Bridges	Road Transport and Highways Division	
3	Prime Minister's Office		32			Bridges Division
4	Armed Forces Division		33	Ministry of Cultural Affairs		
5	Cabinet Division		34	Ministry of Defense		
6	Ministry of Education	Secondary and Higher Education Division	35	Ministry of Disaster Management and Relief		
7		Technical And Madrasah Education Division	36	Ministry of Environment, Forest and Climate Change		
8	Ministry of Housing and Public Works		37	Ministry of Expatriates' Welfare and Overseas Employment		
9	Ministry of Public Administration		38	Ministry of Fisheries And Livestock		
10	Ministry Of Land		39	Ministry of Food		
11	Ministry of Chittagong Hill Tracts Affairs		40	Ministry of Home Affairs	Public Security Division	
12	Ministry of Civil Aviation and Tourism		41			Security Services Division
13	Ministry of Law, Justice and Parliamentary Affairs	Law and Justice Division	42	Ministry of Industries		
14		Legislative and Parliamentary Affairs Division	43	Ministry of Labor and Employment		
15		Parliament Secretariat	44	Ministry of Liberation War Affairs		
16	Ministry of Social Welfare		45	Ministry of Posts, Telecommunications and Information Technology	Posts and Telecommunications Division	
17	Ministry of Agriculture		46			ICT Division
18	Ministry of Health & Family Welfare	Health Services Division	47	Ministry of Religious Affairs		
19		Medical Education and Family Welfare Division	48	Ministry of Primary and Mass Education		
20	Ministry of Foreign Affairs		49	Ministry of Railways		
21	Ministry of Women and Children Affairs		50	Ministry of Shipping		
22	Ministry of Textiles & Jute		51	Ministry of Science and Technology		
23	Ministry of Power, Energy and Mineral Resources	Power Division	52	Ministry of Water Resources		
24		Energy and Mineral Resources Division	53	Ministry of Youth and Sports		
25	Ministry of Planning	Planning Division	54	Ministry of Information		
26		Statistics and Informatics Division	55	Ministry of Finance	Internal Resources Division	
27		Implementation Monitoring & Evaluation Division	56			Economic Relations Division
28	Ministry of Local Government, Rural Development and Co-operatives	Local Government Division	57			Finance Division
29		Rural Development and Co-operatives Division	58			Financial Institutions Division

Source: JICA Study Team

2.2.2 Ministry of Civil Aviation and Tourism (MoCAT)

It consists of the Civil Aviation Authority of Bangladesh (CAAB), the Biman Bangladesh Airlines, the Bangladesh Tourism Board, Bangladesh Services Limited, Hotels International Limited and the Bangladesh Tourism Corporation. The main responsibilities of MoCAT are shown below;

- To contribute to the socioeconomic development of the country by ensuring secure aviation transportation within the territorial air space and airports
- To control air traffic
- To develop tourism industries in Bangladesh



Source: CAAB

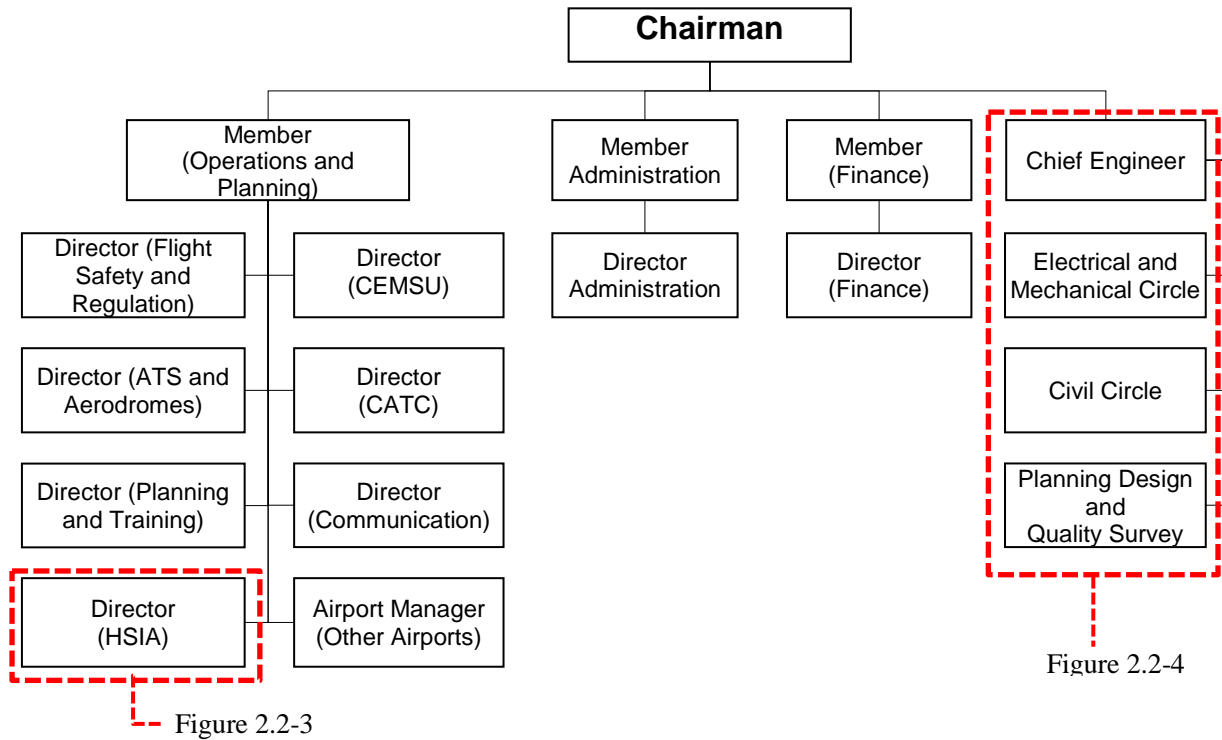
Figure 2.2-1 Organization Chart of MoCAT

2.2.3 CAAB

CAAB functions as the regulatory body for all aviation-related activities in Bangladesh. Aside from being the aeronautical service provider, it is also responsible for safe, expeditious, and efficient flow of air traffic within the Flight Information Region (FIR) bounded by the international geographic boundary of Bangladesh. This organization is the custodian of all airfields and allied facilities including air navigation facilities.

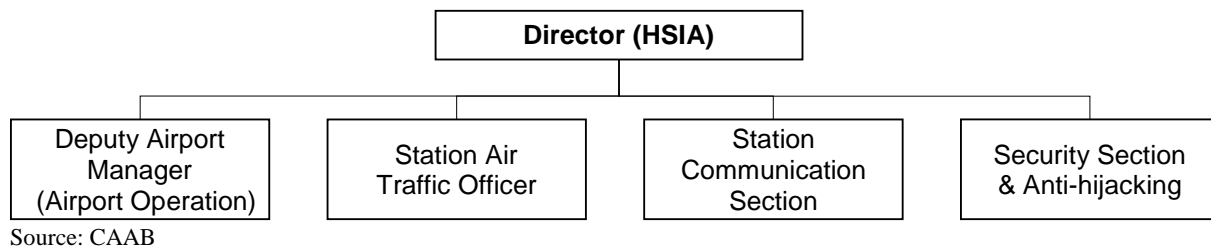
With about 3,000 employees, CAAB operates and maintains the major airport in Bangladesh and all the air traffic control. Within this organization headed by the Chairman are three Board Members who manage respective departments which operate and plan the major airports. The HSIA Director is under the Board Member for Operations and Planning (refer to Figure 2.2-2).

The Chief Engineer supervises the Project Director/Superintending Engineers who are in charge of planning their section of HSIA expansion project. Operation organization is in the Operation & Planning Group which is divided into four sections: Deputy Airport Manager (Airport Operation), Station Air Traffic Officer, Station Communication Section, and Security Section and Anti-Hijacking (refer to Figure 2.2-3). Daily maintenance of facilities, such as cleaning, light, machine, etc., and airport development are handled by four teams, which are the Architecture and Civil Engineering Groups 1 and 2 and the Electric and Machinery Groups 1 and 2. They all function below the Chief Engineer as shown in Figure 2.2-4. The Budget and Revenue in the Finance Group is in charge of operation of commercial facility.



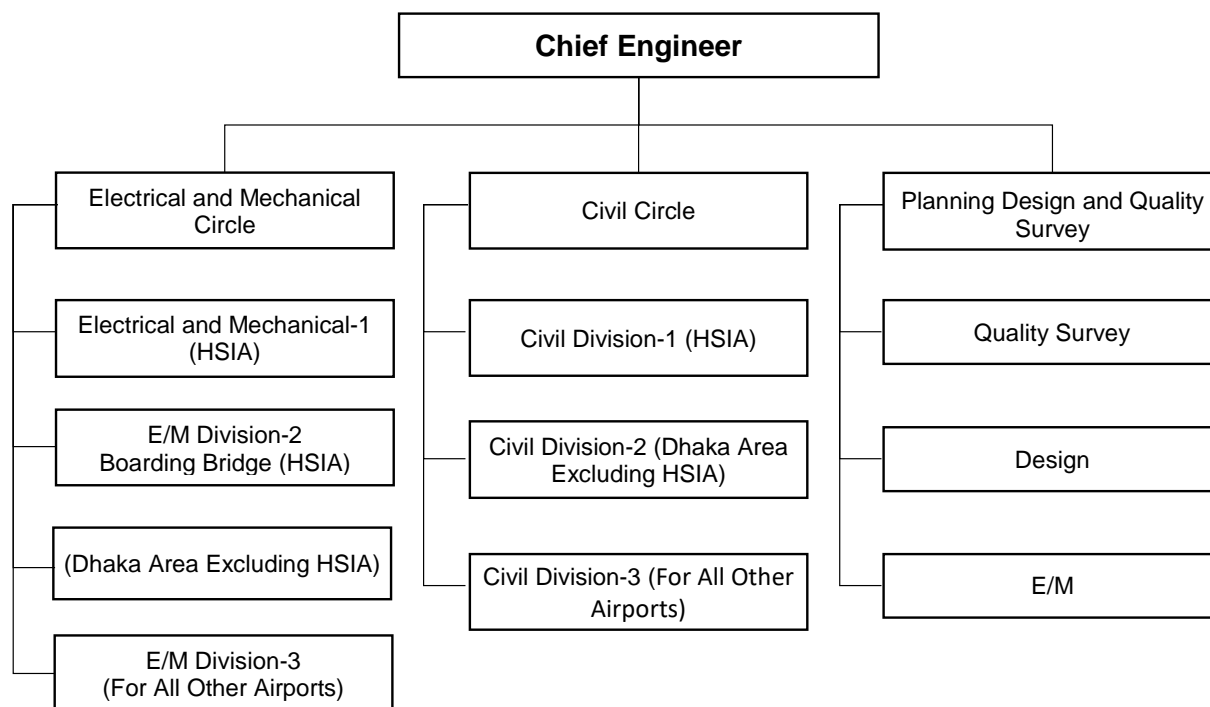
Source: CAAB

Figure 2.2-2 Organizational Structure of MoCAT



Source: CAAB

Figure 2.2-3 Organization Structure of HSIA



Source: CAAB

Figure 2.2-4 Organization Structure of Chief Engineer

2.2.4 Biman Bangladesh Airlines

(1) Service of Biman Airlines

Biman Airlines provides the following services;

- Ramp handling, Passenger handling and Cargo handling for Domestic and International flight of Biman Airlines
- Ramp handling, Passenger handling and Cargo handling for foreign airlines' international flights

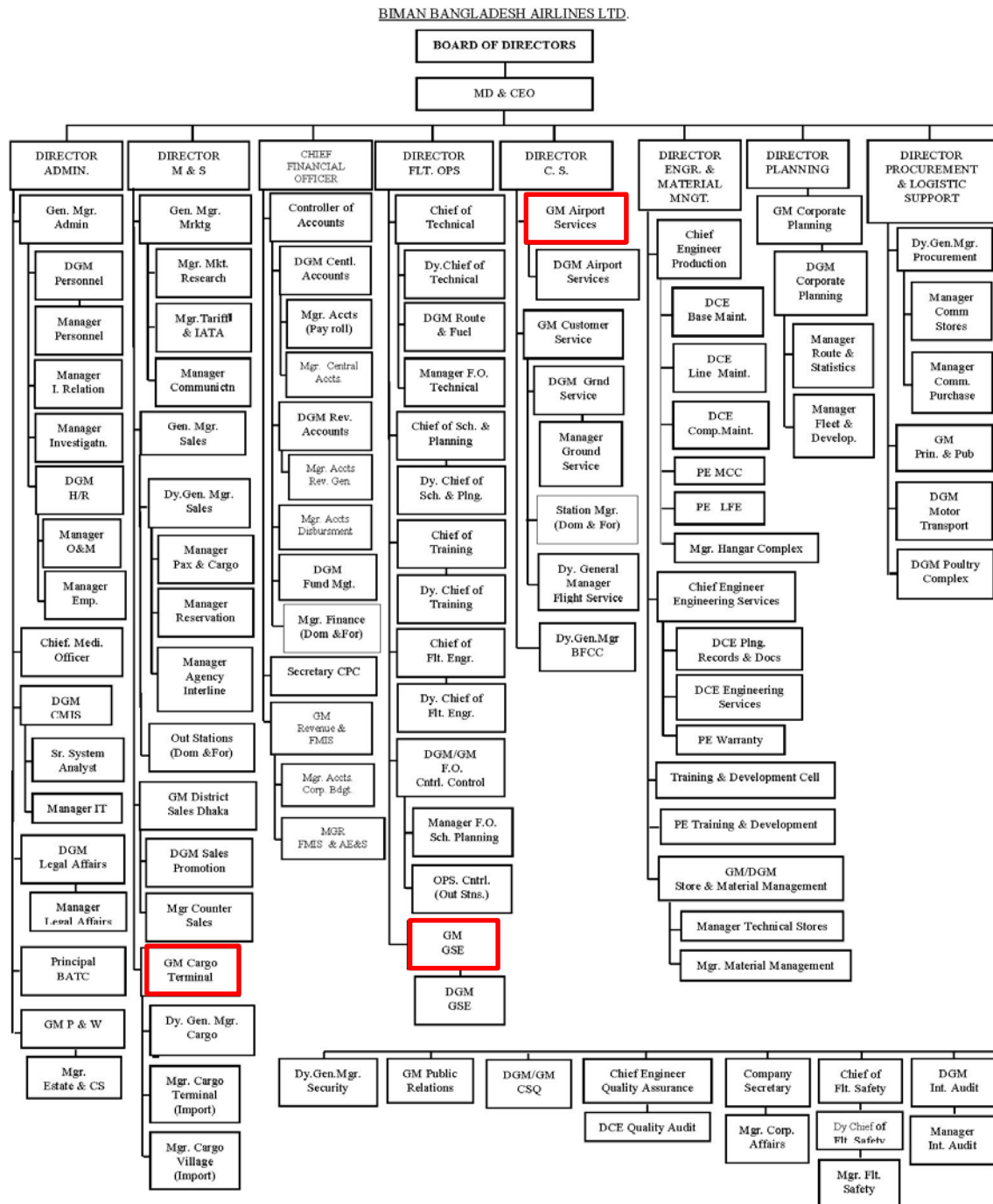
(2) Organization

From the information given by Biman Airlines in February 2018, the total employee working at Biman Airlines is 5,419 people. As shown in Table 2.2-2, there are employee working as General Employee, Cockpit Crew, Engineering/Technical, Staff at Foreign Station and Casual Staff.

Table 2.2-2 Manpower of Biman Airlines

Type of Employee		Number of Employee
General employee	Officer	523
	Staff	1,676
Cockpit crew		139
Engineering/ Technical	Officer	225
	Staff	386
Staff at Foreign Station		70
Casual Staff		2,400
Total		5,419

Source: Biman Airlines



Source: Biman Airlines

Figure 2.2-5 Biman Airlines Organization Chart

(3) Airport Services Division

“Airport Service Division” provides the following four services:

- ➔ Passenger services: check-in, baggage handling, gate services, connection services, lounge services, the handicapped passenger care, arrival passenger handling, baggage return, lost & found etc.

- A part of ramp services: other than operation of Ground Service Equipment (GSE) such as loading/unloading of baggage and cargo, loading of baggage at departure sorting, unloading of baggage at arrival and return of the baggage, etc.
- Load control: load plan, weight & balance, departure control services, etc.
- Domestic services: general domestic services

The top division is GM (General Manager) and manages two sections, "Airport Services" and "Ground Handling".

The GM supervises the general affairs group which is directly under the GM.

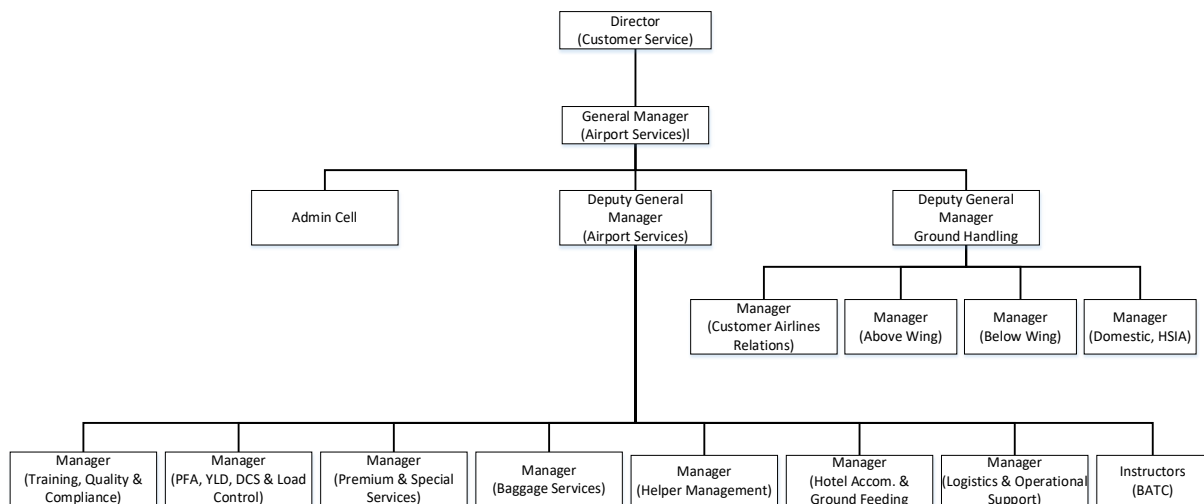
GM is responsible for the entire Airport Services department and implements correspondence with the managers of Biman Airlines. Deputy General Manager supports GM and is responsible for operating section.

The organizational structure and roles of the two sections are as follows.

1) Airport Services

The section chief deputy general manager is responsible for training, quality and compliance, Unit Load Device (ULD), Departure Control System (DCS) and Load Control. Premium and special services, baggage services, helper management, hotel accommodation and ground feeding, logistics and operations.

The organization chart is as shown in Figure 2.2-6.



Source: Biman Airline

Figure 2.2-6 Organization Chart of Airport Service Division

2) Ground Handling

The section chief deputy general manager supervises and manages the customer airlines relations, above wing, below wing and domestic of the HSIA

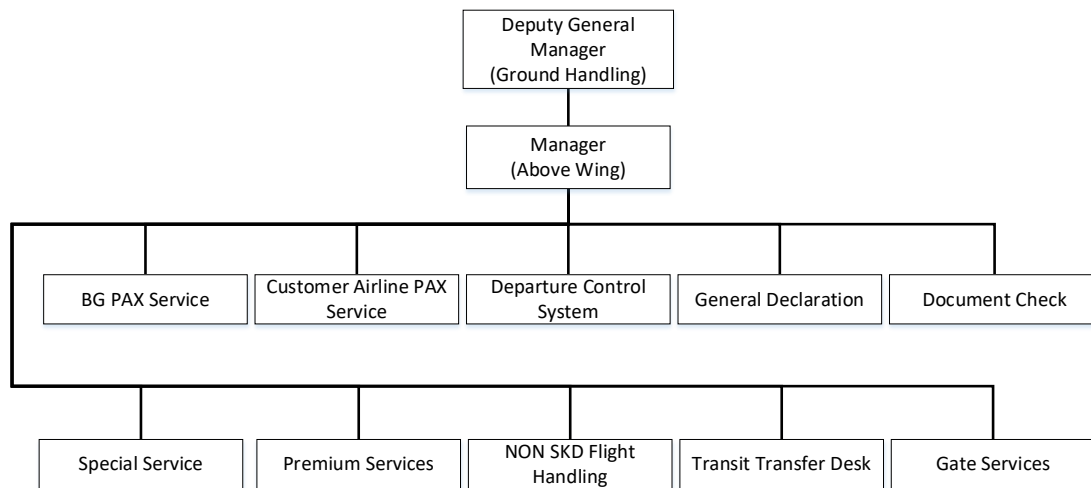
Function in each unit is shown as follows:

a) Customer Airlines Relations

Coordinating field work for foreign airlines entrusting services to Biman Airlines (shift work)

b) Above Wing

Performs Biman Airlines passenger service, customer airlines passenger service, departure control system, general declaration, document check, Special services. Premium services, non-schedule flight handling, transit/transfer desk and gate services. The organization chart is as shown in Figure 2.2-7.

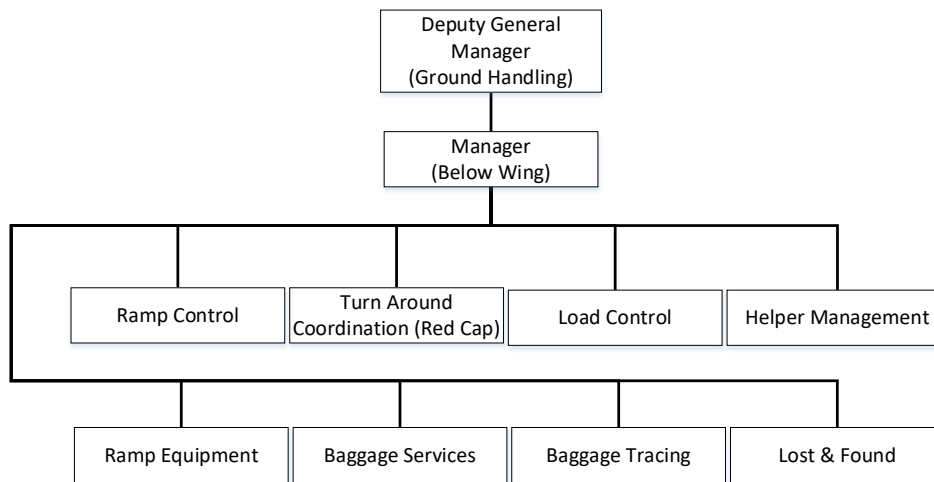


Source: Biman Airlines

Figure 2.2-7 Organization Chart of Above Wing Division

c) Below Wing

Performs ramp services for Biman Airlines and foreign airlines. The ramp services include ramp control, turn around coordination (red cap), load control, helper management, ramp equipment, baggage services, baggage tracing and lost & found. The organization chart is as shown in Figure 2.2-8.

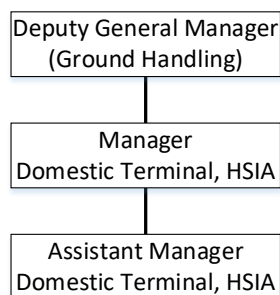


Source: Biman Airlines

Figure 2.2-8 Organization Chart of Below Wing Division

d) Domestic, HSIA

Responsible for general operation of domestic passenger services. The organization chart is shown as Figure 2.2-9.



Source: Biman Airlines

Figure 2.2-9 Organization Chart of Domestic and HSIA Division

3) Staffing (Airport Services)

The number of planned staff is 1782 and the actual number of staff is 883. The staffing ratio (actual staffing divided by planned staffing) is 52.31%.

Table 2.2-3 Planned Staff Number

	Planned Staff Number
General Manager (GM)	1
Deputy General Manager (DGM)	2
Manager	14
Assistant Manager	34
Officer/GSO	105
Jr. Officer	125
Supervisor/GSS	275
GSA	320
MLSS/Helper	906
Total	1,782

Source: Biman Airlines

The following were observed during the field work on the staffing for the airport service:

- (1) Number of the staff registered at present
- (2) Planned minimum number of staffing
- (3) Extra Officers/staff is needed for the shortage of staff during annual leaves and training
helpers are also needed for the shortage because of the absent (average 20%)
If there is no. (3)
 - No one would able to take an annual leave
 - No one would able to take a mandatory training
 - Manning shortage would be caused because of sickness absent
- (4) The number needed for front line operations

The Airport Service Department is short staffed because the staffing ratio (actual staffing divided by planned staffing) is approximately 50%. On top of that, the helper's high ratio of absence due to sickness prevents the provision of stable service. It is not possible to provide training to the staff to maintain and improve the level of performance under this staffing situations.

Table 2.2-4 Level of Staffing Plan vs Actual

	Actual Staffing (a)	Planned Staffing (min) (b)	Reserved Staffing for Leave of Absence, Sickness and Training (c)	Total Staffing (d)=(b)+(c)	Ratio (a)/(b)	Ratio (a)/(d)
Officers/ Staff	383	802	89	891	47.76%	42.99%
Helper	500	886	221	1107	56.43%	45.17%
Total	883	1688	310	1998	52.31%	44.19%

Source: Biman Airlines

(4) GSE Division

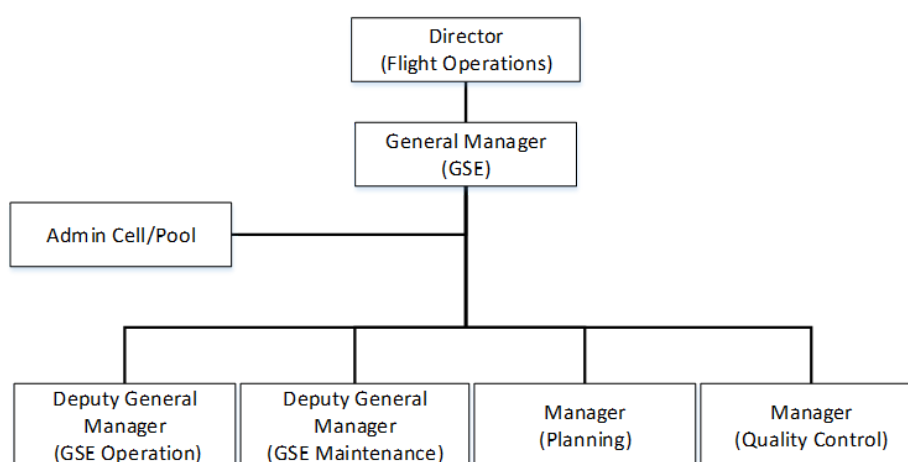
Services provided by the Airport Services Department is loading and unloading without GSE operation and baggage handling at the arrival sorting area and baggage handling departure sorting area.

The general manager of the GSE department supervises four sections, GSE operation, GSE maintenance, planning and quality control. The GSE operations section is in-charge of operations and maintenance of GSE.

The administration department which is organized under the GM is in charge of general affairs for the GSE department and is operated by 13 staff.

GM is responsible for the entire GSE department and implements correspondence with the managers of Biman Airlines. Deputy General Manager supports GM and is responsible for operating section.

The organization chart is as shown Figure 2.2-10.



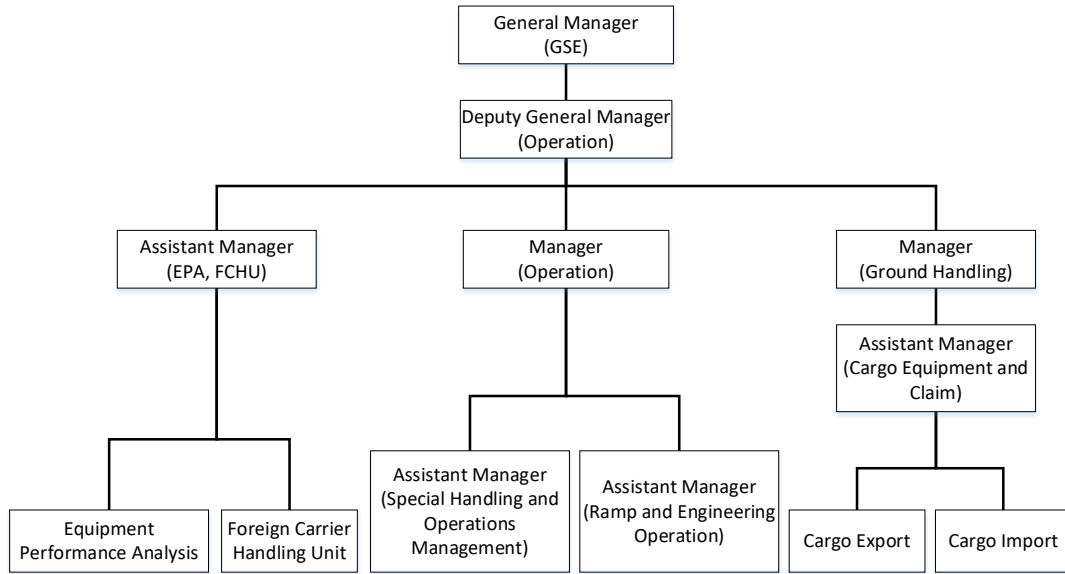
Source: Biman Airlines

Figure 2.2-10 Organization Chart of GSE Division

The organization and function of each section are as follows;

1) GSE Operation

The deputy general manager is the head of the section and manages and supervises 347 staff. This section operates the GSE and provides ground handling for Biman Airlines flights and flights entrusted by other airlines. It performs the following services such as loading and unloading passenger baggage and cargo, transfer of passenger baggage and cargo, pushback and towing of the aircraft, water and lavatory service to the aircraft, provision of passenger step vehicle, GPU and air conditioning for the aircraft. The type of GSE provided for handling varies and is dependent on the requirement of the airlines. The organization chart is as shown in Figure 2.2-11.

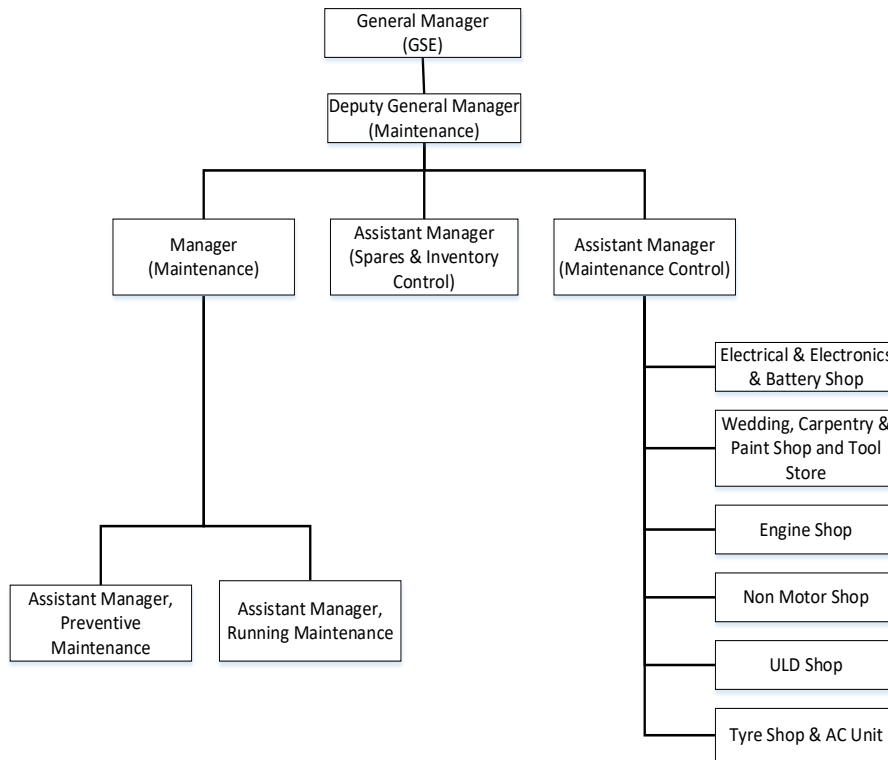


Source: Biman Airlines

Figure 2.2-11 Organization Chart of GSE Operation Department

2) GSE Maintenance

The deputy general manager, the head of the section, manages and supervises 161 staff. This section is responsible for maintenance and repair of GSE, performing repairs in case of GSE malfunction and performing maintenance. If it is not repairable by them, they seek service support from the manufacturer or local representative. The organization chart is as shown in Figure 2.2-12.



Source: Biman Airlines

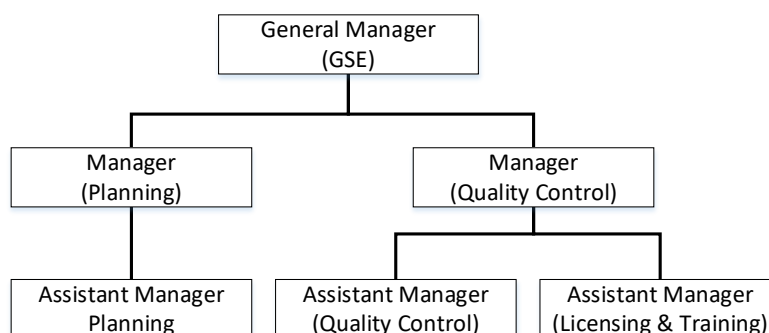
Figure 2.2-12 Organization Chart of GSE Maintenance Department

3) Planning

The manager, head of the section supervises six staffs. This section is responsible for GSE operation planning and purchase plan. Organization chart is as shown in Figure 2.2-13.

4) Quality Control

The manager, head of the section supervises eight staffs. This section is responsible for quality control of GSE organization chart which is shown as shown in Figure 2.2-13.



Source: Biman Airlines

Figure 2.2-13 Organization Chart of Planning and Quality Control Department

5) Human Resource and Related to Training

Staffing shortage is observed in various positions of the department in comparison to the planned staffing. The staffing ratio (actual number divided by planned staffing) is 57.96%. This shows that shortage is significant. Furthermore, GSE operation is affected by absenteeism of part time employees as GSE operations are staffed by many part time employees. The manning plan is shown in Table 2.2-5.

- Handlers: There are three shifts of eight hours work on a per day basis.
Six working days with one-day off per week either on Friday or Saturday.
- Office Work Hours: from nine to five while days off are on Fridays, Saturdays and holidays.

Table 2.2-5 Manning Plan

	Planned staff number	Actual staff number
General Manager (GM)	1	1
Deputy General Manager (DGM)	2	1
Manager	5	2
Assistant Manager	11	1
Officer/Jr. Officer	62	2
Supervisor	4	5
Operator	327	214
Technician	121	60
Assist/Cleaner	7	27
Total	540	313
Ratio		57.96%

Source: Biman Airlines

Hiring condition is as below.

- GSE Operator: over 12 years of school education and Has a driver's license from Bangladesh Road Transport Authority (BRTA)
- Mechanic: Holder of national vehicle mechanic license in Bangladesh

Provides the following training upon hired (fit for GSE operator)

- Training at Bangladesh Airlines Training Center (BATC)
- Training on SMS, ramp safety, DGR, etc.
- On-the-job-training (OJT)
- License issued on each equipment by Biman Airlines
- Driver apron pass (DAP) is issued by the Civil Aviation Authority of Bangladesh (CAAB)
- Vehicle driver's license in ramp area is valid for one year, renewal upon verbal test

Upon completion of this process, he will become a company license holder (fit for GSE operation)

- Training at Bangladesh Airlines Training Center (BATC)
- Training on SMS, ramp safety, DGR, etc.
- On-the-job-training (OJT)
- License issued on each equipment by Biman Airlines

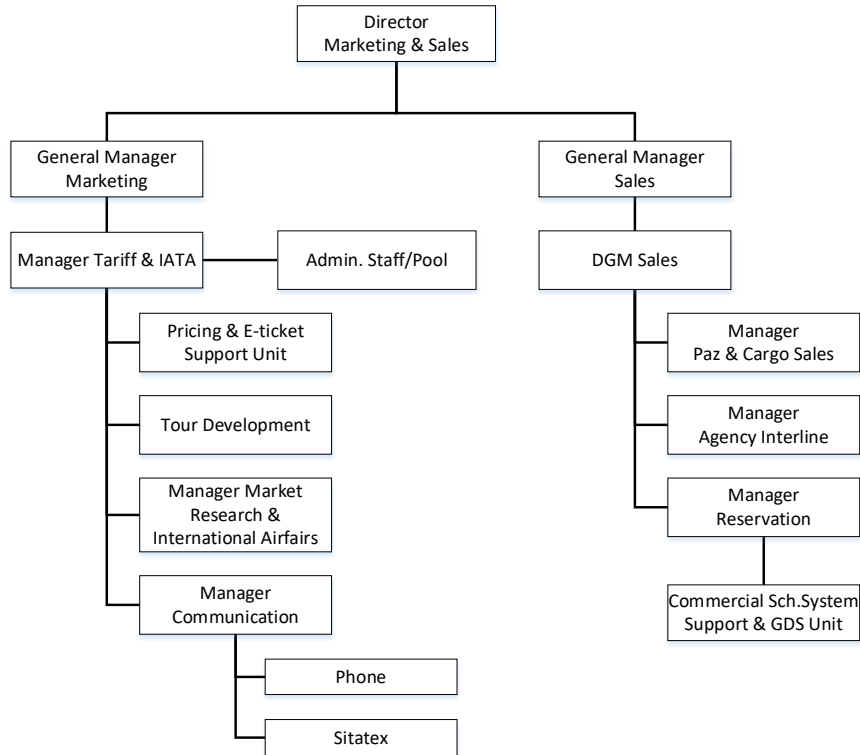
(5) Cargo Department of Biman Airlines

Organization of Cargo department of Biman Airlines is "Cargo Terminal" which is a lower organization of "Marketing & Sales" and "General Administration" for human affair concurrently serves as passenger section.

The number of staff under G.M. of "Cargo Terminal" is 122. The number of part timers so called "Casual Staff" is 2,400 consists of 44% of total number of staff of Biman Airlines in which part timers for "Cargo Terminal" supposed to be more than 1,000.

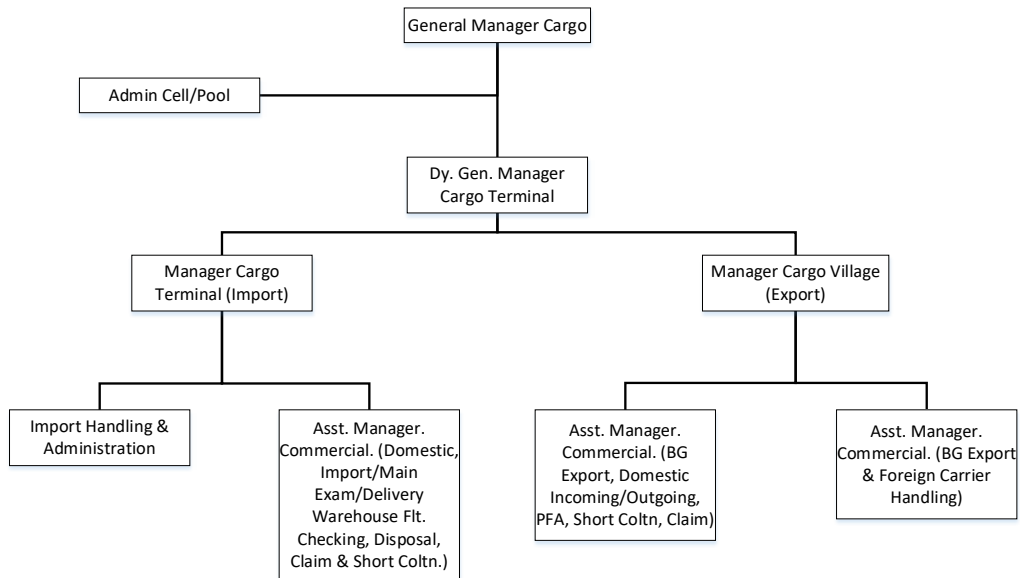
The skill level observed in cargo handling

- Basic training is surmised insufficient.
- ULD on the dolly and cart are left unlocked posing a potential imperilment to airport safety
- Throw, stamp on and lay down on the cargo is in breach of cargo handling manual
- Container placed direct on the ground was lifted up by human power hocking the base on the corner of dolly posing a potential damage on container.
- The supervisory position staff on site was not observed.
- In the area other than RA3 so called "Common area, as Biman Airlines is not reliable in handling, forwarders including Japanese forwarders entrust work to other party than Biman which comes to double payment for them.
- There seem too many part timers in composition of total staffers and 20% of them work absence on average.



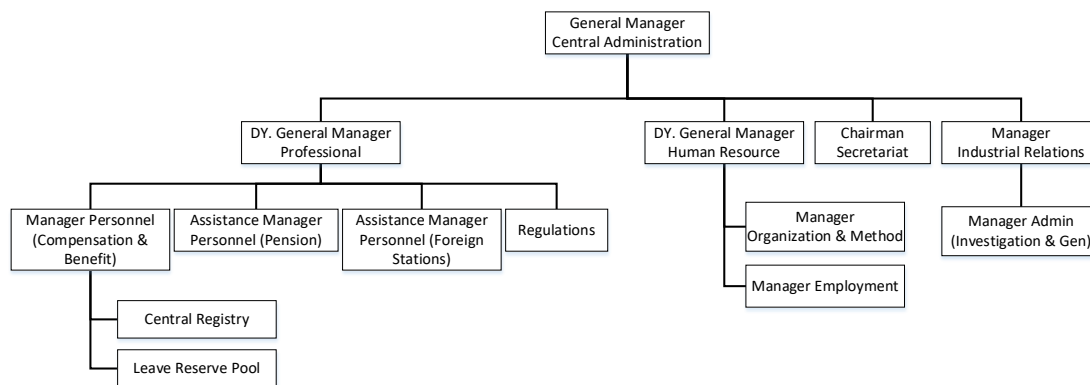
Source: Biman Airlines

Figure 2.2-14 Biman Marketing & Sales Organization (Upper Organization of Cargo Terminal)



Source: Biman Airlines

Figure 2.2-15 Biman Cargo Terminal Organization (Operation of Export/Import Cargo Warehouse)



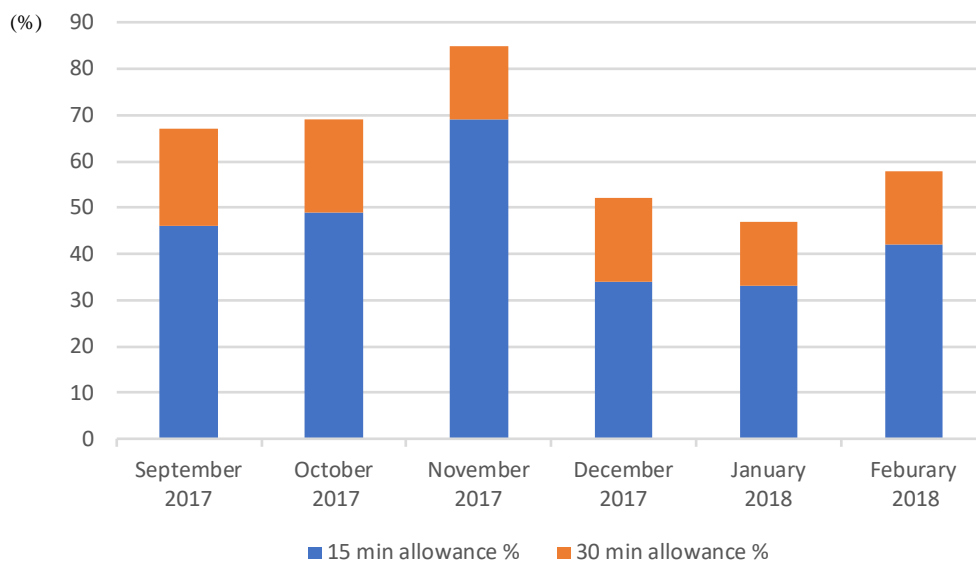
Source: Biman Airlines

Figure 2.2-16 Biman GM Administration Organization (Jurisdiction of Cargo Terminal Personnel and Training)

(6) Outline of the Service

1) On-Time Performance (OPT)

From the latest data of OPT given by Biman Airlines which were from September 2017 to February 2018, are shown in Figure 2.2-17. The numbers were not stable since there was maximum of ration difference was 30%, which was between November and December. The average of OPT within 15 minutes allowance from the scheduled arrival time was 46%, and 3 minutes allowance was 63%.



Source: Biman Airlines

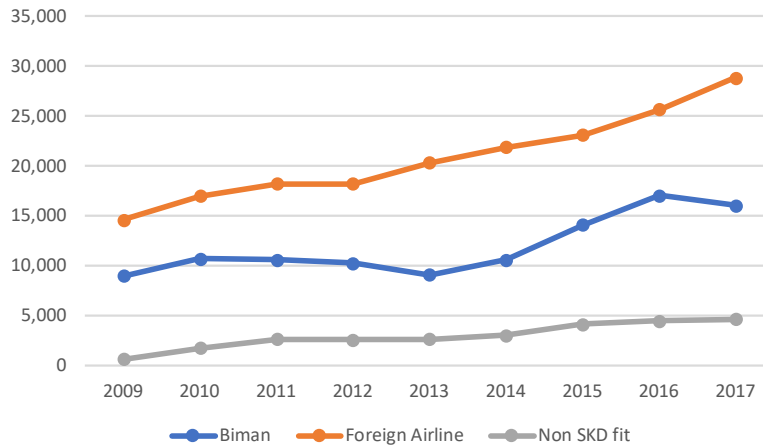
Figure 2.2-17 OTP of Biman Airlines

2) Ramp Service

a) Ground Handling

From the latest data regarding number of flight which Biman Airlines handled from 2009 to 2017, are shown in Source: Biman Airlines

Figure 2.2-18. Since the only airlines that conducting ground handling service in HSIA is Biman Airlines, this numbers also shows the number of flight that arrived/departed to/from HSIA at the same time. The number of flight are growing every year except for 2012. In 2017, the total number of flight that Biman Airlines handled were 49,515. Focusing on the airlines of the handled flight, the numbers are growing so rapidly that it went doubled in 2017 compared to 2009.

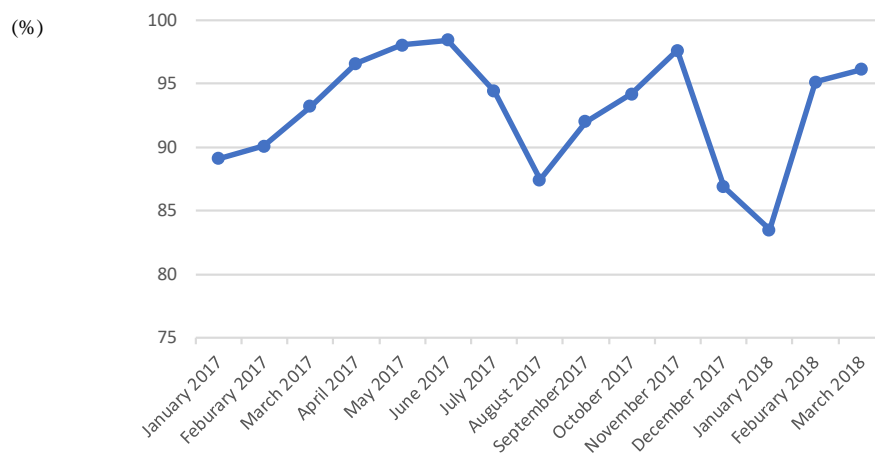


Source: Biman Airlines

Figure 2.2-18 Amount of Flight that Biman Airlines Ground Handled

b) Waiting Time for the Baggage to Arrive

From the latest data regarding the waiting time of baggage to arrive at the BHS, January 2017 to March 2018, are shown in Figure 2.2-19. These numbers could be used to evaluate the ground handling service of Biman Airlines. Since Biman Airlines believe that the service level is good enough if they were able to deliver the first baggage to the BHS within 85 minutes from the time when aircraft had spot-in. Since it is common to set the goal as 30 minutes after spot-in in Japan, the premise of this figure has to be taken into consideration. The average ratio of 15 months was 93% meaning that Biman Airlines were able to deliver the first baggage to the BHS within 85 minutes most of the time.



Source: Biman Airlines

Figure 2.2-19 Biman Airlines First Baggage to Arrive (within 85 minutes)

2.2.5 Airlines

(1) Domestic Airlines

As shown in Table 2.2-6, there are total of 4 domestic airlines is HSIA including Biman Airlines.

Table 2.2-6 List of Airlines that Operate Domestic Flights at HSIA (Bangladesh Airlines)

Airline	2 letters	3 letters	Base	Destination	Aircraft
Biman Bangladesh Airlines	BG	BBC	Bangladesh	London (United Kingdom) / Doha (Qatar) / Dubai (UAE) / Jeddah (Saudi Arabia) / Riyadh (Saudi Arabia) / Dammam (Saudi Arabia) / Muscat (Sultanate of Oman) / Kuwait (Kuwait) / Kathmandu (Nepal) / Kolkata (India) / Yangon (Myanmar) / Bangkok (Thailand) / Singapore (Singapore) / Kuala Lumpur (Malaysia)	77W 738 DH8
Novoair	VQ	NVQ	Bangladesh	Kolkata (India)	ATR
Regent Airways	RX	RGE	Bangladesh	Dammam (Saudi Arabia) / Muscat (Sultanate of Oman) / Doha (Qatar) / Kathmandu (Nepal) / Kolkata (India) / Bangkok (Thailand) / Kolkata (India) / Singapore (Singapore)	73N
US-Bangla Airlines	BS	UBG	Bangladesh	Muscat (Sultanate of Oman) / Doha (Qatar) / Kathmandu (Nepal) / Kolkata (India) / Guangzhou (China) / Kolkata (India) / Singapore (Singapore) / Bangkok (Thailand)	738 73N

Source: JICA Study Team

Table 2.2-7 Operation of Domestic Airlines (Except for Biman Airlines)

Airlines	Operation Condition
US-Bangla Airlines (BS, UBG)	<ul style="list-style-type: none"> → Check-in counter Row C is assigned → Bring own equipment such as note or PC to the counter. → They post signboards for destination of flight for the check-in → Provided services depend on boarding class and flight destination. → Three to four staffs in uniform at the check-in counter assist the passengers with baggage and guide the passengers to the counters. → Staff wear the uniform. → Self-handling → Their flights are often assigned to remote spots #18 - #28 → US-Bangla Airlines have their own airside bus.
Regent Air (RX, RGE)	<ul style="list-style-type: none"> → Row C is assigned to their check-in. → Provided services depend on the boarding class for all flights. → Brings own equipment such as note or PC to the counter. → Staff wears own uniform. → Self-handling. → Their flights are often assigned to a remote spot #18~#28. → US-Bangla Airlines have their own airside bus.
Novo Air (VQ, NVQ)	<ul style="list-style-type: none"> → They use Row C for check-in. → Staff wears own uniform. → Self-handling. → Remote bays (#13-14) are normally assigned for boarding

Source: JICA Study Team



Photo 2.2-1 Check-in Counter (L) Airside Bus of US-Bangla Airlines (R)



Photo 2.2-2 Regent Check-in Counter (L) Airside Bus of Regent Airways (R)

(2) International Airlines

As shown in Table 2.2-8, there are total of 24 foreign airlines operating at HSIA. In total, there are 28 airlines including the 4 Bangladesh airline.

The status of operation is listed below.

- They use rows A, B, E for check-in.
- For wide body aircrafts, two staff are assigned from Biman Airlines for check-in.
- For narrow body aircrafts, one staff is assigned from Biman Airlines for check-in.
- Biman Airlines staff provides services for them while wearing Biman Airlines uniform for check-in.
- Priority counter for business class passenger is set-up.
- There is no sign board displaying flight number and destination.
- There is not enough storage space for signage.

Table 2.2-8 List of Airlines that Operate International Flights at HSIA (Foreign Airlines)

Airline	2 letters	3 letters	Base	Destination	Aircraft
Air Arabia	G9	ABY	UAE	Sharjah	319, 320
Air India	AI	AIC	India	Kolkata	319
SriLankan Airlines	UL	ALK	Sri Lanka	Colombo	333
AirAsia	AK	AXM	Malaysia	Kuala Lumpur	320
China Eastern Airlines	MU	CES	China	Kunming	738
China Southern Airlines	CZ	CSN	China	Guangzhou	33A
Maldivian	Q2	DQA	Maldives	Malé / Chennai (India)	320
Druk Air	KB	DRK	Bhutan	Thimphu	319
Etihad Airways	EY	ETD	UAE	Abu Dhabi	77W
Gulf Air	GF	GFA	Bahrain	Bahrain	330
Cathay Dragon	KA	HDA	Hong Kong	Hong Kong	330, 333
Jet Airways	9W	JAI	India	Kolkata / Mumbai / Delhi	73H, 739
Kuwait Airways	KU	KAC	Kuwait	Kuwait	77W

Airline	2 letters	3 letters	Base	Destination	Aircraft
Malaysia Airlines System	MH	MAS	Malaysia	Kuala Lumpur	738
Malindo Air	OD	MXD	Malaysia	Kuala Lumpur	738
Pakistan International Airlines	PK	PIA	Pakistan	Karachi	320
Qatar Airways	QR	QTR	Qatar	Doha	320
SpiceJet	SG	SEJ	India	Kolkata	DH8
Singapore Airlines	SQ	SIA	Singapore	Singapore	333
Saudi Arabian Airlines	SV	SVA	Saudi Arabia	Riyadh / Medina / Jeddah / Dammam	77W
Scoot	TR	TGW	Singapore	Singapore	320
Thai Airways International	TG	THA	Thailand	Bangkok	772
Turkish Airlines	TK	THY	Turkey	Istanbul	333
Emirates Airlines	EK	UAE	UAE	Dubai	77W

Source: JICA Study Team

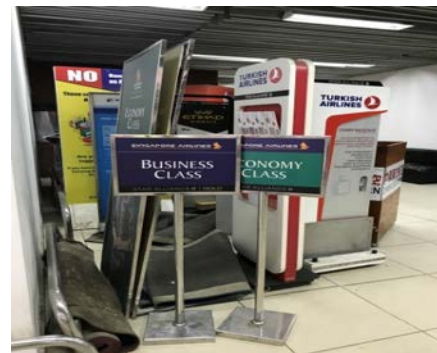


Photo 2.2-3 Foreign Airlines check-in counter

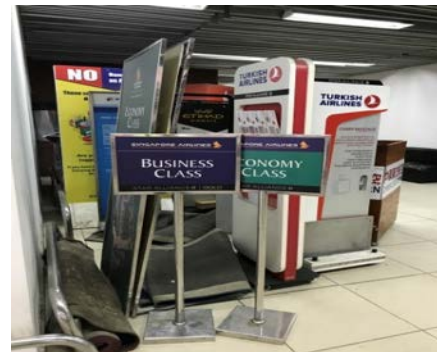


Photo 2.2-4 Full of Storage for Signage (L) Overflowed Signage (R)

(3) Airport Operations Committee (AOC)

AOC is an organization that consists of airlines at HSIA in order to discuss about the transportation services of passengers and freight. In 2018, the chairman airline is Malaysia Airlines, and the secretariat airline is Cathay Pacific Airways.

2.3 Traffic Volume of HSIA (Passenger, Landing/Departing, Cargo)

2.3.1 Number of Passengers

Although the percentage of passengers on international flights was 77.2% in 1999, it increased to almost 90% after 2011. On the other hand, the number of domestic flight passengers had been stable from 1999 to 2009, with a record of around 700,000 passengers nationwide in 2007. It dropped to 520,000 passengers in 2010. After which, a steady increase has been recorded, even though the demand remains small. The average annual growth of the number of air passengers from 2010 to 2017 was 6.4%.

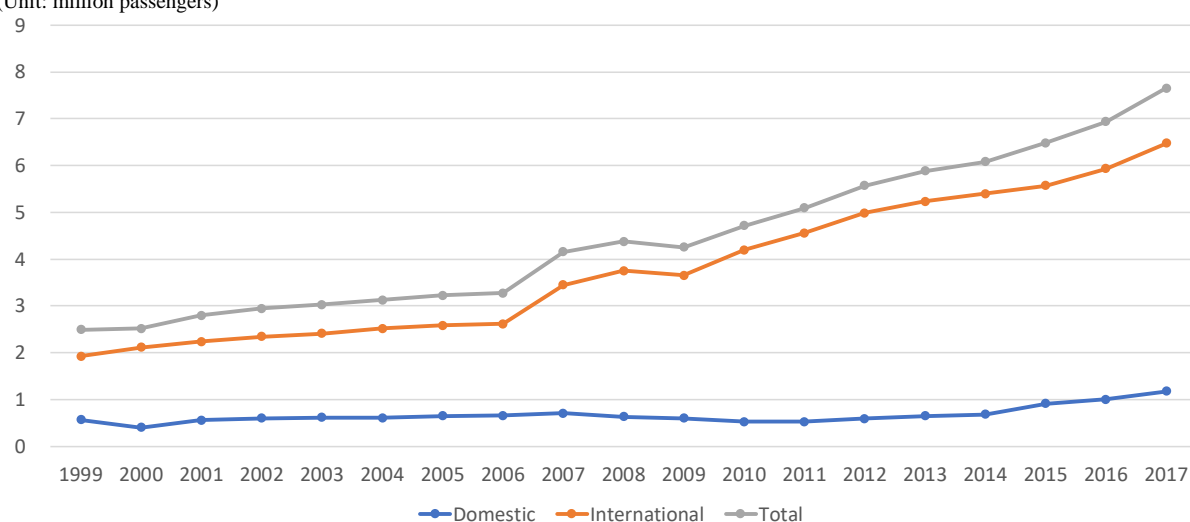
Table 2.3-1 Number of Passenger in HSIA

(Unit: million passengers)

Year	Domestic Passenger	International Passenger	Total	International Passenger Ratio (%)
1999	0.566	1.923	2.489	77.24
2000	0.403	2.112	2.515	83.98
2001	0.557	2.240	2.796	80.09
2002	0.603	2.346	2.949	79.56
2003	0.616	2.414	3.030	79.66
2004	0.612	2.516	3.128	80.43
2005	0.648	2.580	3.228	79.93
2006	0.657	2.619	3.276	79.95
2007	0.708	3.450	4.158	82.97
2008	0.631	3.749	4.380	85.59
2009	0.597	3.657	4.254	85.97
2010	0.523	4.194	4.717	88.91
2011	0.528	4.562	5.090	89.63
2012	0.589	4.984	5.573	89.43
2013	0.648	5.232	5.880	88.98
2014	0.685	5.399	6.084	88.74
2015	0.913	5.569	6.482	85.91
2016	1.003	5.937	6.940	85.55
2017	1.173	6.477	7.650	84.67

Source: JICA Study Team based on the given data by CAAB

(Unit: million passengers)

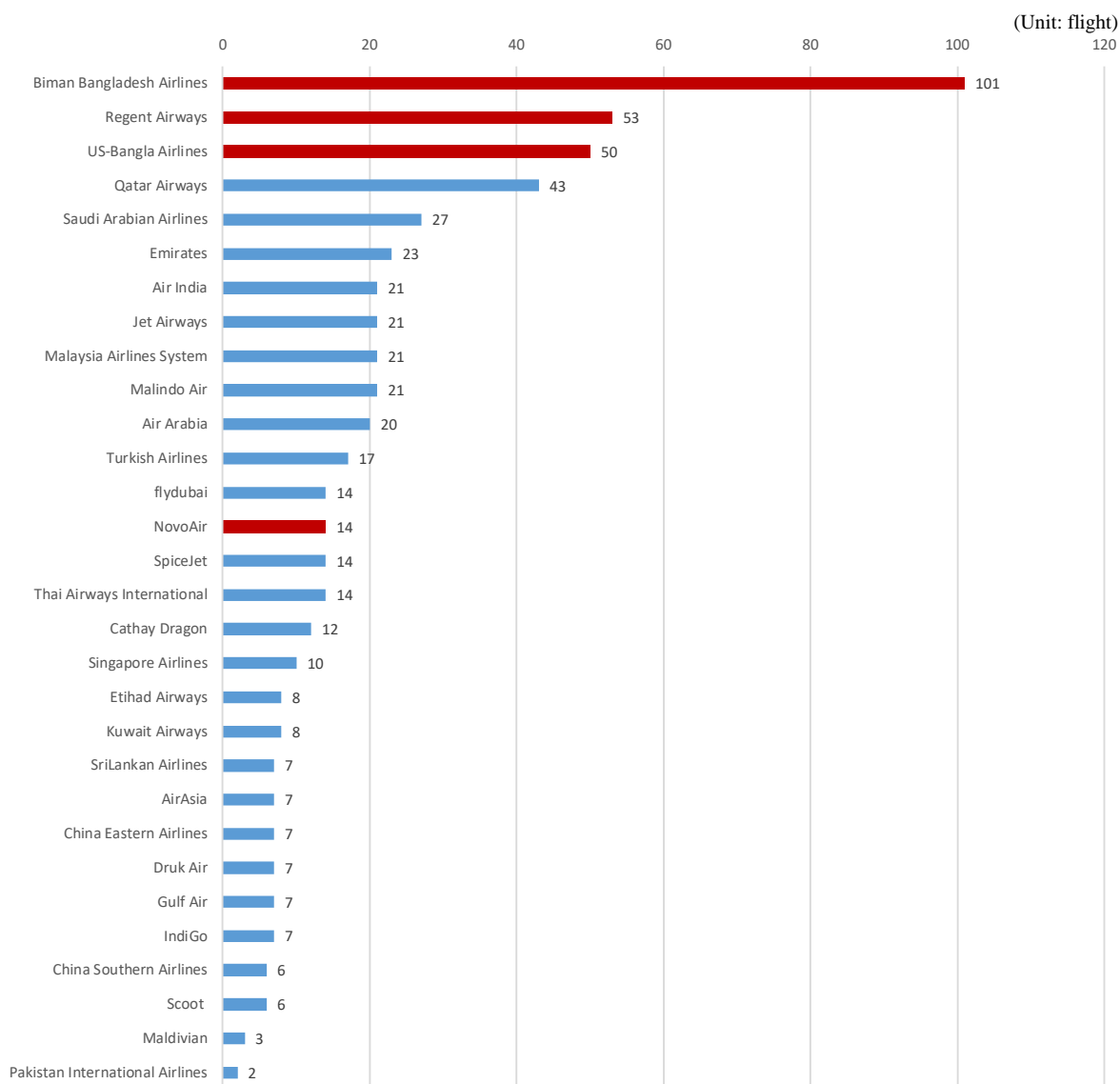


Source: JICA Study Team based on the given data by CAAB

Figure 2.3-1 Number of Passengers at HSIA

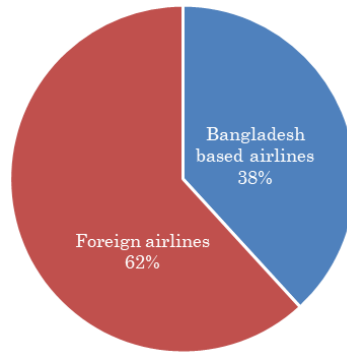
2.3.2 Number of Departing/Landing

Regarding the 2018 summer flight schedule data (April 2018-October 2018) given by the Station Air Traffic Officer (SATO), the average number of departing passenger flight is 80 and landing passenger flights at HSIA is 82 flights. The busiest airline is Biman Bangladesh Airline which operates 14 flights per day. Other airlines based in Bangladesh, such as Regent Airways, US-Bangla Airlines, etc., also occupy most of the flight schedule. Referring to Figure 2.3-3, the 4 airlines based in Bangladesh make up 38% of all airlines serving at HSIA.



Source: JICA Study Team based on the given data by CAAB

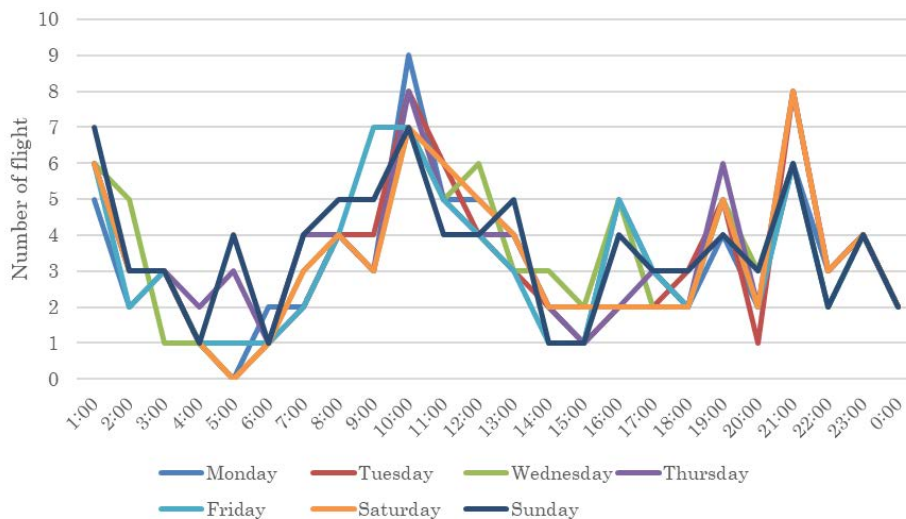
Figure 2.3-2 Number of Departing Airlines from HSIA per Week



Source: JICA Study Team based on the given data by CAAB

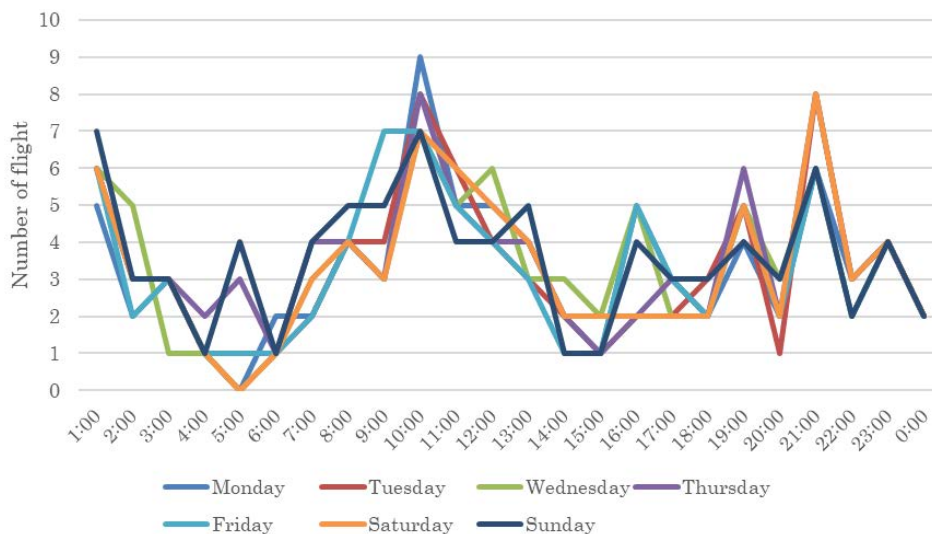
Figure 2.3-3 Ratio of Number of Flights Classified by Base Country

According to the 2018 summer flight schedule of HSIA, Figure 2.3-4 and Figure 2.3-5 show the departing and arriving passenger flights classified per hour. The peak hour for flight departures is 9:00-11:00 and 20:00-22:00. On the other hand, the peak hour for flight arrivals is 8:00-10:00 and 16:00-18:00.



Source: JICA Study Team based on the given data by CAAB

Figure 2.3-4 Number of Departing Flights per Week Classified by the Departure Time



Source: JICA Study Team based on the given data by CAAB

Figure 2.3-5 Number of Arriving Flights per Week Classified by the Arrival Time

2.3.3 Cargo Volumes

The cargo volume of HSIA between 2009 to 2017 are shown in Table 2.3-2.

Table 2.3-2 Tonnage of Cargo in HSIA

Year	Export	Import	Total	Growth Rate		
				Export	Import	Total
2009	100,254	44,670	144,924	-	-	-
2010	116,163	45,300	161,463	15.9%	1.4%	11.4%
2011	115,406	67,701	183,107	-0.7%	49.5%	13.4%
2012	132,424	84,393	216,817	14.7%	24.7%	18.4%
2013	146,015	88,023	234,038	10.3%	4.3%	7.9%
2014	147,326	99,152	246,478	0.9%	12.6%	5.3%
2015	154,585	103,425	258,010	4.9%	4.3%	4.7%
2016	171,405	110,588	281,993	10.9%	6.9%	9.3%
2017*	188,546	121,647	310,193	10.0%	10.0%	10.0%
		Average Growth Rate		8.4%	14.2%	10.1%

Source: CAAB

* 2017 data is estimated number referring the growth rate of import/ export cargo volume.

The volume of cargo is increasing at an average rate of 8.4% per year for import and more rapidly 14.2% for export between 2009 and 2016. In 2016, HSIA was handling 171,405 tons for export and 110,588 tons of import cargo. Cargo has a propensity for peak season in January, February, June, July, October, November and December and slack season in February.

Most of the imported goods are from Hong Kong and China followed by India, Pakistan and Taiwan. Garments were largely imported from Hong Kong and China, while chemical and pharmaceutical products were imported from Europe. Japan is ranked 14th, accounting for 1,020 tons.

Export cargo was mainly destined for Europe, in which Germany had the largest volume with 648,825 tons, followed by the United Kingdom with 444,654 tons, and Spain with 81,729 tons. Most of the exported goods for Europe were apparel goods, followed by leather goods, while perishable goods were largely exported to the Middle East. Japan is the 9th export destination, accounting for 4,261 tons.

Table 2.3-3 Major Export/Import Products

Export Cargo		
Major Export Destination	Major Items	Ratio
Germany	Apparel Goods	73~76%
U.K.	Fresh Vegetable	16~17%
Spain	Fresh Aquatic Product	3~4%
Import Cargo		
Major Import Origin	Major Items	Ratio
Hong Kong	Textile/Accessories	60~63%
China	Pharmaceuticals/Raw Materials	15~18%
India	Mobile Phones and the Accessories	5~7%

Source: Biman Airlines

2.4 Operation Situation and Facility of the International Passenger Terminal Building

The current situation of the study target facilities are described in this chapter.

2.4.1 Layout of the Passenger Terminal Building

The terminal facilities of HSIA contains 1 floor domestic passenger terminal building, 3 floor international passenger terminal building, 1 floor domestic/international cargo terminal building, VVIP terminal building, infrastructure supply facility, management/office building. Related facilities are independent in their terminal area.

The floor area of each facility are shown in Table 2.4-1. The existing international passenger terminal are terminal 1 and terminal 2 which are in the same building with floor area of 73,400 m².

The layouts of passenger terminal building are shown in Figure 2.4-1 and Figure 2.4-2.

Table 2.4-1 Floor Area Table of Passenger Terminal Facility

Facility	Floor Area
International Passenger Terminal (T1, T2)	73,400 m ²
Domestic Passenger Terminal	2,200 m ²

Source: CAAB

There are terminal 1 and terminal 2 for the international terminal which are connected. This 2 terminal share same departure lobby and departure gates.

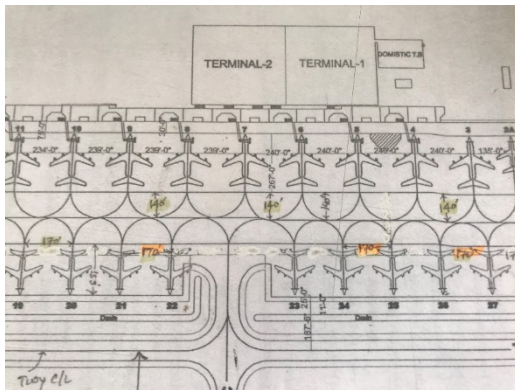
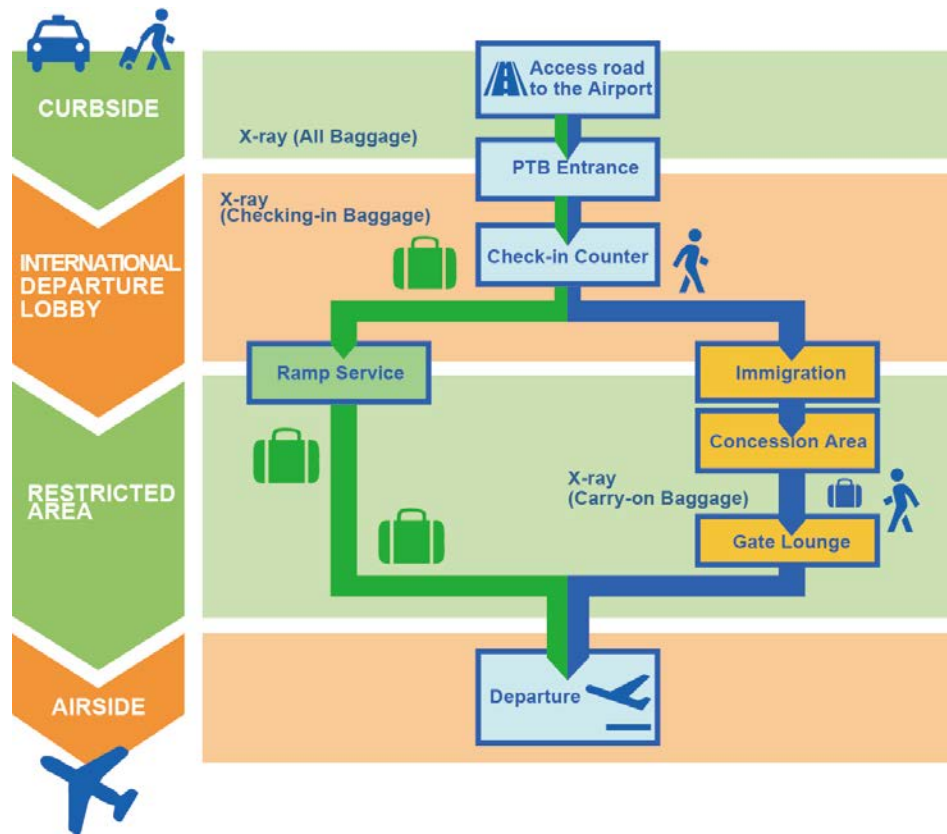


Photo 2.4-1 Spot Layout of International Terminal (L) Appearance of the Terminal (R)

The domestic terminal is next to the international terminal 1 connected with the passageway.

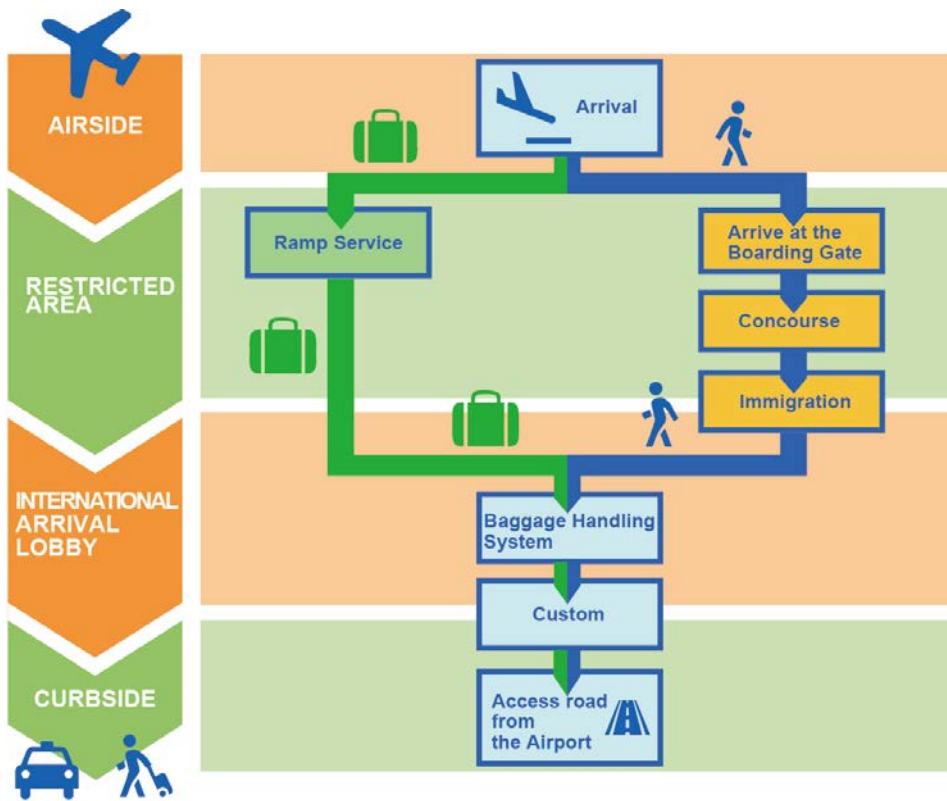


Photo 2.4-2 Departure Curbside of International Terminal (L) Departure Lounge (R)



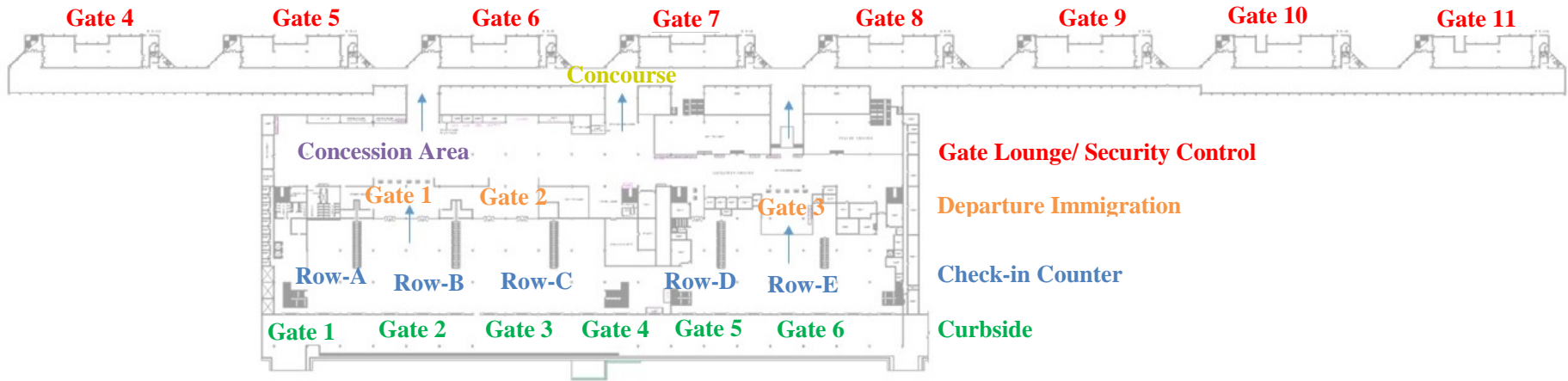
Source: JICA Study Team

Figure 2.4-1 Departure Flow of Passenger and Baggage



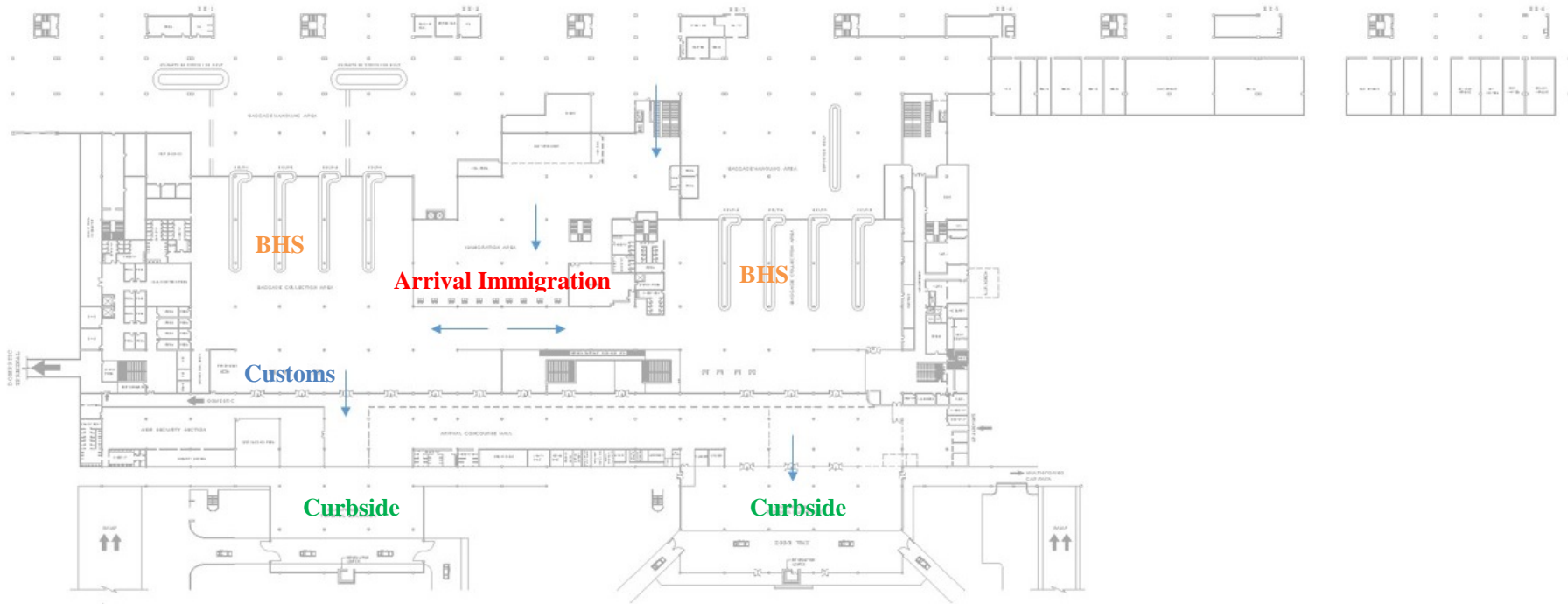
Source: JICA Study Team

Figure 2.4-2 Arrival Flow of Passenger and Baggage



Source: JICA Study Team

Figure 2.4-3 1st Floor Plan of the International Passenger Terminal Building in HSIA (Departure)



Source: JICA Study Team

Figure 2.4-4 2nd Floor Plan of the International Passenger Terminal Building in HSIA (Arrival)

2.4.2 Curbside and Entrance at the Departure Floor

(1) Curbside

The entrance of HSIA gets crowded with people waiting for security check at the peak hours. The people overflow to the road since the pathway in front of the passenger terminal building is so narrow that the pathway will be filled with people who came to see off and baggage carts other than just passengers. At the same time, the curbside will also be congested because of the narrow curbside. This situation could easily cause an accident. The people who came to see off the passengers could purchase an entrance ticket (300BDT) to enter the departure lobby.



Photo 2.4-3 Pathway in Front of the International Passenger Terminal Building

The current situation of the curbside is explained below;

- The police are managing the departure and arrival floor. The vehicles are allowed to stop in front of the terminal building only for 2 minutes for getting on-off purpose.
- There is an information center at the arrival curbside which is managed by the police team called CRT (Crisis Response Team) that would offer arrival flight information. (Photo 2.4-4)
- It is hard for the passenger to understand the spot to get off their vehicle since there is no airlines signage at the departure curbside. (Photo 2.4-5)
- Both departure and arrival lobby are crowded with taxis, buses and vehicles. The management of the curbside is not enough. e.g.) no taxi pool (Photo 2.4-5)
- Regarding the departure curbside, there are 2 steps between the road level to the departure lobby level. (Photo 2.4-6)
- There is a fence on the pathway along the road to the departure lobby that blocks the pedestrian way to the building and forces them to get off on the road. (Photo 2.4-8)



Photo 2.4-4 Information Counter at the Arrival Floor

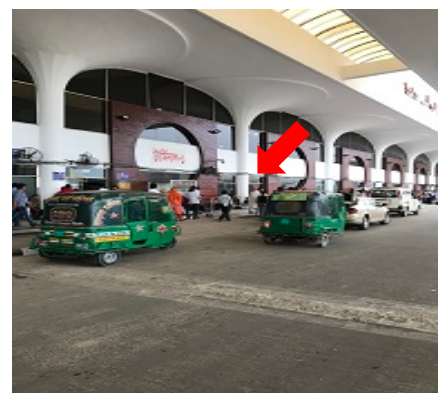


Photo 2.4-5 Curbside at the Arrival Floor



Photo 2.4-6 Level Difference at the Curbside



Photo 2.4-7 Pathway and Slope that connects to Departure Floor



Photo 2.4-8 The pathway being blocked by the Fence

(2) Entrance of the International Terminal

At the entrance of the terminal, six (6) security gates (#1 to #6) are installed. The security check uses x-ray on the baggage and gate shaped metal detector for passengers.

Due to staff shortage, four (4) gates are actually used for operation (three (3) gates for passengers and one (1) gate for the staff.). The airport has a plan to hire an additional 300 staff to enable operation of all the six (6) gates in one month.



Photo 2.4-9 Security Equipment (L) Inspection Box for Women (R)



Photo 2.4-10 Closed Gate 1 (L) Gate (R)



Photo 2.4-11 Gate 6 is for the Airline Staff, Crew and Goods

2.4.3 Departure Lobby

(1) Overview

Check-in counter peak usage periods are during the mornings, 17:30 to 21:30 and late at night.

Baggage carts left by passengers unattended block smooth flow of passengers.



Photo 2.4-12 Departure Lobby with Baggage Carts

- Passengers lining at the counters filling in the departure document blocked the flow of passenger waiting for check-in.
- Many airlines such as Malindo Air restricts non-passengers to enter into their check-in area, while some airlines do not restrict them, the check-in area is congested with no passengers. For check-in of the flights that does not restrict entry of non-passengers.
- According to Biman Airlines, the Civil Aviation Authority, Bangladesh (CAAB) plans to introduce self-check-in kiosk machines in the future.

(2) International Check-in counter

Check-in counters are peninsular shaped while one peninsular is called a row. There is a total of five (5) rows ranging from row A to E. There is a plan to add 3 Rows to cope with increase of the passengers. (Detail is not known) The peak hours for check-in at the airport happens during the morning, 5:30 pm to 9:30 pm and midnight and it is dark in Check in counter area are due to low ceiling.



Photo 2.4-13 Departure Lobby



Photo 2.4-14 Check-in counter

Table 2.4-2 Overview of 5 Check-in Peninsular

Row	Content
Row A	<ul style="list-style-type: none"> → Mainly used by foreign airlines such as Emirates, Thai Airways and Singapore Airlines. → There are six counters on both sides, making the counters 12 in total.
Row B	<ul style="list-style-type: none"> → There are six counters on both sides, making the counters 12 in total. → Mainly used by Saudi Arabia Airlines. It is the only airline with fixed counters. Treated favorably. → Check the arrival visa
Row C	<ul style="list-style-type: none"> → There are six counters on both sides, making the counters 12 in total. → Used by US Bangla Air, Regent Air and Novo Air. → They bring in own equipment for check-in. → The conveyor in Sorting is circular, but because there are obstacles, they can only load from one side.
Row D	<ul style="list-style-type: none"> → Reserved exclusively for Biman Airlines, however, the left side of the peninsula is made available for use by other airlines if necessary. → Two counters on either side were opened during the survey. → There are two types of boxes from customers for CAAB (complaint box) and Biman Airlines (comment box) → Using the stanchion pole for keeping passenger movement. → There are counters for each boarding class.
Row E	<ul style="list-style-type: none"> → There are 13 counters in total. → Biman Airlines uses it for LHR flight (B777). LHR flight is assigned to the counter at the end of the row due to a special security requirement. → Emirates and Etihad use the counter for wide bodied aircrafts.

Source: JICA Study Team

1) Assignment for Check-in Counter

CAAB establishes the rules for check-in counter operation.

Check-in counters are commonly used; the CAAB manually creates counter management tables based on airline flight schedules.

- CAAB has the authority to assign counters; and does so accordingly to the management tables.
- We confirmed with the airline that they did not have a counter management table. Therefore, the counter is first-come-first-served, and each airline has different counters on a daily basis.
- Airlines face difficulty in securing the counter. They resort to occupy the counter by waiting in the lobby looking for any counter to become available after check-in. They open the check-in when they secured enough counters. This leads to chronic delay of opening of the check-in.
- The delay in check-in opening causes delay in check-in counter number display in Flight Information Display System (FIDS).



Photo 2.4-15 Counter Exchange between Air Arabia and AirAsia



Photo 2.4-16 Check-in counter for Bangladesh Airlines



Photo 2.4-17 Full view of the counter



Photo 2.4-18 Check-in counter for Business Class

2) Operation of Check-in Counter

The operation of the check-in counter is listed below

- The x-ray check machine for the baggage and monitoring room are located on the boundary between the baggage belt and the sorting area.
- Each check-in counter is equipped with Société Internationale de Télécommunications Aéronautiques (SITA), passport reader, boarding pass Printer and Baggage Tag Printer. SITA machines are commonly used by airlines.
- A digital display is installed at the top of every check-in counter.
- It is observed that baggage belt stops due to the malfunction of Baggage Handling System (BHS) and the repair takes half a day. During that period baggage have to be transported manually.



Photo 2.4-19 Baggage Belt



Photo 2.4-20 Weight Scale

3) Operation of Biman Airlines

The operation of check-in counter by Biman Airlines is described below:

- Services performed mostly by male employees.
- As there is no sign posted for flight number or destination, passengers are queuing at the counter to ask about where to check-in.
- Due to the many baggage carried by passengers, most passengers use the carts.
- There is no staff to guide passengers as to where to check-in, and no scansion poles to separate the passengers. In general, due to the lack of guidance from the airlines to the passengers, chaotic situations are observed such as long winding waiting line for the check-in and lack of order for the queuing.



Photo 2.4-21 Cart is not organized



Photo 2.4-22 In front of the crowded check-in counter

- Check-in counters open for wide body aircraft 3:30 4 hours prior to departure, it opens 3 hours prior to departure for narrow body aircraft.
- Number of staff assigned to check-in is two to three from Biman Airlines.
- There is no separate counter for passengers that have already web checked-in. Passengers with baggage have to line up at the counters for other passengers.
- There are priority counters for first and business class passengers.
- For priority passengers, priority baggage tag is attached on their baggage.

(3) Double Security Check Procedures on the Checked Baggage (Red Tagging)

The operation of received baggage inspection (Red Tag) is described below:

- Procedures instructed by CAAB
- Double security checks of baggage are conducted on 5% of departure passengers
- Passengers are chosen randomly for the checks.
- Red tags are attached on the baggage of the chosen passengers in addition to ordinary baggage tag.

- The chosen passengers are not provided with boarding pass but are instructed to proceed to the monitoring room for x-ray checks.
- At the monitoring room, baggage physical checks are conducted on the baggage, and the passengers are provided with Red Tag pass upon clearance of the baggage check.
- The passengers exchange red tag pass with the boarding pass at the counter.
- The inspector sometimes overlooked Red Tagging Baggage.



Photo 2.4-23 Red Tag



Photo 2.4-24 X-ray Room is under Yellow Signage

2.4.4 Priority Lounge

On the third floor of PTB3, there are eight lounges, two of which are operated by Biman Airlines and Thia Airways.

(1) Biman Airlines Lounge/ MASLIN

- Biman Airlines Lounge is used by priority passengers and business class passengers.
- It is open for 24 hours.
- Operations of lounge includes meal service and is provided by Spices company.
- Services include hot meal and non-alcohol beverages.



Photo 2.4-25 Biman Airlines Lounge

(2) Thai Airway Lounge

- The facility looks old.
- Services hot meal, alcohol and non-alcohol beverages. (Sky lounge)
- They have contracts with many airlines for passenger use.
- Priority pass arrangement.
- Services good hot meal.
- Room for smokers
- They do not provide alcoholic beverages.

(3) Other Lounge

Operated by bank or credit card company.



Photo 2.4-26 Balaka Executive Lounge (City Bank & American Express Lounge)



Photo 2.4-27 Imperial Lounge

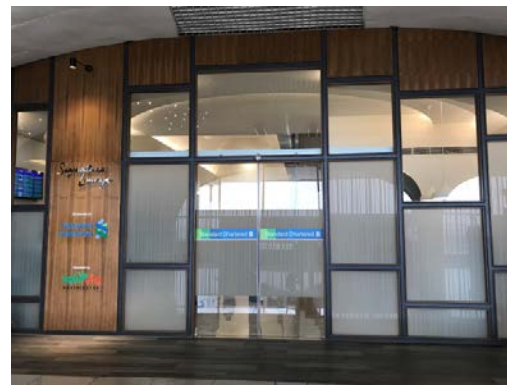


Photo 2.4-28 Signature Lounge

(4) Sky Lounge

There are multiple airlines contracted for the lounge. Also, there are lounges that could be entered using Priority Pass.

2.4.5 Departure Concourse and Gate (Include Passenger Boarding Bridge)

The facility was renovated recently, so it is bright and clean.

- Gate (#4~11) with PBB



Photo 2.4-29 PBB

- Departure passenger flow and arrival passenger flow mingle in the terminal building as there are no separation for their movement. In order to secure security and order for the departing passengers security checks are conducted upon entry to the gate lounge and passengers in the lounge are separated. Once passengers leave the lounge, they need to go through the security check again to enter the lounge. With respect to spot #4 and #11, arrival passenger movement was segregated by a glass wall due to the high risk of passenger mixing from its facility structure make up.
- For spots #4/5 and #10/11, the security check is conducted at a single location at the gate and where arrival passengers are separated by the glass wall from departure passengers, therefore there is no mixing of arrival and departure passengers for these spots.
- At the time of passengers entering the boarding gate, airlines conduct mandatory checks on them such as boarding pass, passport inspection, baggage check by x-ray, passenger check by gateway and hand-held metal detector.

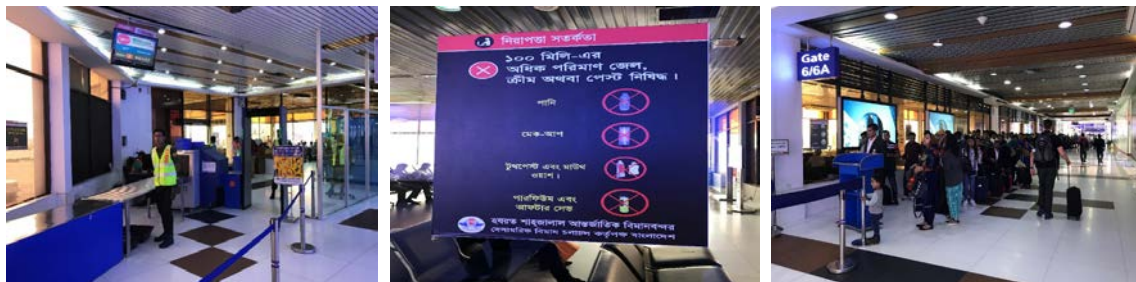


Photo 2.4-30 Gate Security and Waiting Line

2.4.6 Departure Gate and Boarding

(1) Boarding Pass Check, Passport Check, Conducting Gate Security

- Check boarding pass a) passenger name b) flight number c) destination
- Identify verification with photo in passport.
- Check passenger's name with boarding pass and passport and collect the boarding pass
- Security check for baggage and body check with one x-ray and gate type detector.



Photo 2.4-31 Security Check at Boarding Gate

- The delay for allocation of gate causes the delay for opening the security check and for departure.
- Passport check by the immigration police is done again after the security check.
- The airline staff scans half of the boarding pass using the boarding pass reader at the airline desk inside the gate lounge.
- Research for the non-boarding passenger with airline system and the half of boarding pass.
- Boarding after completion of arrangement inside the cabin, boarding announcement is held in accordance with respective airline's standard. The equipment for announcement is allocated at the departure lounge.

(2) Departure Boarding Lounge

Passengers upon completion of boarding pass matching and passport inspection, are permitted to enter the boarding gate. Passengers need to go out of the boarding gate, as there is no toilets, shops, water fountain, and smoking area. There is not enough sitting space for the wide body aircraft.



Photo 2.4-32 Departure Gate Lounge

(3) Boarding

- At each PBB gate, passengers go down to the ground floor level using the stairs. Security personnel is on guard at the door to the stairs.
- Passengers who arrived at remote spots are transported to spot #7 by bus and would proceed to the arrival floor for immigration checks.

2.4.7 Remote Spot

(1) Departure

- An ambulance lift car is used for loading and unloading at the remote bay.
- During departure, the bus goes besides the aircraft riding on the ramp bus. During arrival, the bus heads to the arrival lobby riding on the ramp bus.
- There are only two ambulance lift cars at HSIA for the handicapped passengers using wheel chairs or stretchers. According to one of the foreign airlines representatives, they had to hand carry a wheel chair over the stairs with handlers, as the lift car is not available. Priority is given to Biman Airlines flights over other flights in assigning the lift car. Hand-carrying the wheel chair with a passenger poses a danger for injury. It is reported that there was case of a passenger injury in the past from this type of handling.

(2) Arrival

At each PBB gate, passengers go down to the ground floor level using the stairs. Security personnel is on guard at the door to the stairs. Passengers who arrived at remote spots are transported to spot #7 by bus and would proceed to the arrival floor for immigration checks.

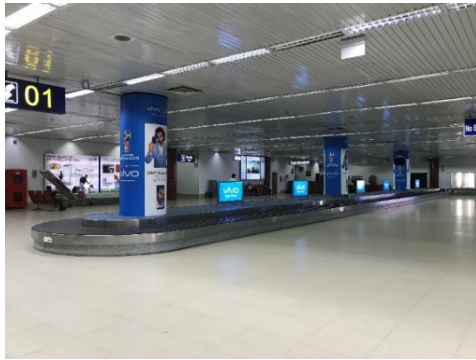


Photo 2.4-33 Bus Gate 7A

2.4.8 Arrival Baggage Claim (BHS)

Operation of BHS is listed as below.

- There are four baggage turn tables in Terminal 1 (#1~4)
- There are four baggage turn tables in Terminal 2 (#5~8)
- Tables #5 and #8 are U-shaped long tables for wide body aircrafts.
- The sign board display for baggage pick up is located before the immigration check area.
- The turn table signages of terminal 1 and 2 are simple and easy to understand. (Photo 2.4-35)
- The digital display at each turn table shows the arrival time of the first baggage and elapsed time. (Photo 2.4-36)
- To prevent the staff at the sorting area to open the passengers' baggage without permission, there are windows at the BHS area so that people could see them. (Photo 2.4-37)



Terminal 1



Terminal 2

Photo 2.4-34 Arrival BHS



Photo 2.4-35 Display Showing the Way to the BHS



Photo 2.4-36 Display at the Pillar Close from BHS



Photo 2.4-37 The Window at the BHS Area

2.4.9 Connection Flights

- Connection Services (Check-in, Accommodation meal service).
- Transit lounge located in front of the counter



Photo 2.4-38 Seal Provided by Each Contracted Hotel



Photo 2.4-39 Connection Lounge

Table 2.4-3 Transit Condition

Item	Content
Connection from domestic flights to international flights	<ul style="list-style-type: none"> → Most connections are from Sylhet and Chittagong. → Passengers are already passed the Customs, Immigration, Quarantine (CIQ) procedures at the previous airport. → Baggage are checked-in through to the final destination. → Domestic passengers after arrival at the international terminal are transferred to the domestic terminal. → For example, in BG001 bound for London, 350 out of the total 400 passengers are connecting from Sylhet. The domestic flight from Sylhet arrives at the PBB spot of the international terminal. The connecting passengers proceeded to enter the international terminal and the 50 domestic passengers are transferred to the domestic terminal after arrival at the spot. → International passengers go on board after the security check at each gate. → Arrival baggage of the domestic passenger is transported to the domestic terminal after being sorted at the international sorting area. → Arrival baggage of the international passengers are built up to load on the aircraft with the other baggage from HSIA.
Connection from International to Domestic Flights	<ul style="list-style-type: none"> → Upon arrival at HSIA, all the passengers go through the CIQ procedures. → Passengers connecting to domestic flights will proceed to the domestic terminal. → Information display for transfer between the domestic and international terminal is not clearly posted.
International to International Flight Connection	<ul style="list-style-type: none"> → Passengers whose connecting time is less than 8 hours are to wait at the transit lounge at HSIA. → Passengers whose connecting time is more than 8 hours are provided with accommodation and a meal by Biman Airlines staffs at HSIA. → Passengers without visa may apply for a transit visa to enter the country. → Passengers with a transit visa may enter the country upon completion of accommodation and meal arrangement. → Despite of transit time, the passenger will not receive their baggage as it will be delivered to the final destination.

Source: JICA Study Team

2.4.10 Baggage Handling

(1) Departure

- Terminal 1: Make-up conveyors are at three locations
- Terminal 2: Make-up conveyors are at two locations
- Biman Airlines uses Terminal 2 mainly and there is a sorting office there.
- Related to Biman Airlines flight
- Enough staff for make-up”
- Enough ULD for loading”
- ULD is placed next to the make-up conveyor.

At the departure sorting area, it is observed that handlers throw baggage around and take the baggage down from the pile of the baggage to the belt or the ground.

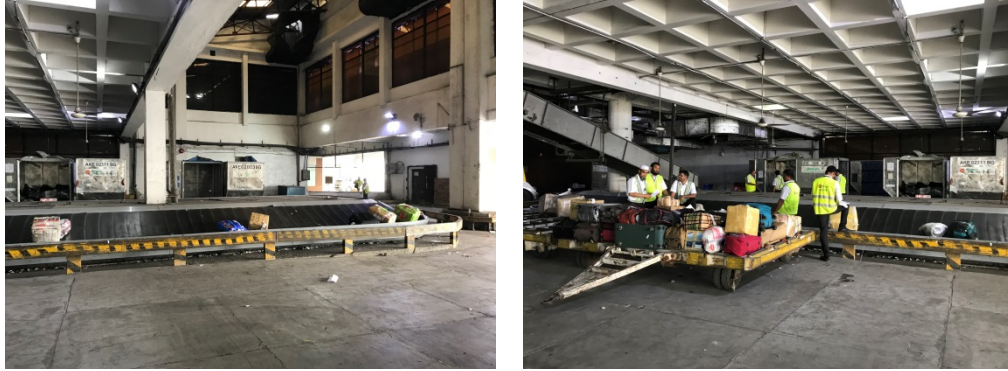


Photo 2.4-40 Departure Sorting Area at Terminal 2

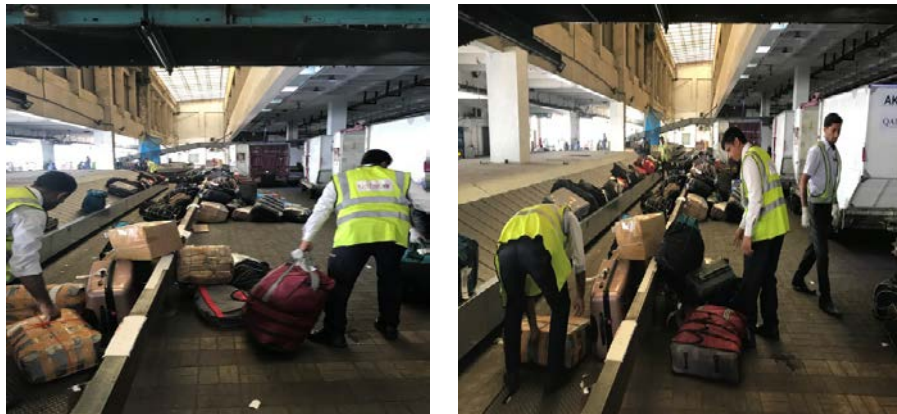


Photo 2.4-41 Arrival Sorting Area

(2) Arrival

The handling condition of received baggage from arrival passenger are explained below;

- There are 4 conveyers and 4 turn tables for arrival baggage break down in the in terminal 1.
- The roller part of break down conveyer is damaged.
- There are 4 conveyers and 4 turn tables for arrival baggage break down in the in terminal 2.



Photo 2.4-42 Baggage Claim for Saudi Airline

- Regent airways and Qatar airways are arranging staffs at the baggage claim area to check if there is any miss receiving of the baggage.
- There are windows at the turn table and sorting side of the wall so that the sorting staff could be seen from the baggage claim area. This widow is to prevent the staff to open the baggage and handle the baggage roughly.



Photo 2.4-43 View from Baggage Claim Area

When large volumes of baggage are checked-in and when some baggage are loaded on the pallets, handlers are supposed to take the baggage on the top off from the piles to avoid damage and follow such process. But such process is time consuming. To save time, handlers sometimes try to collapse the piles of baggage onto the grounds causing baggage damage. They are often spotted throwing lighter baggage and dropping the heavy baggage from the piles to the ground.

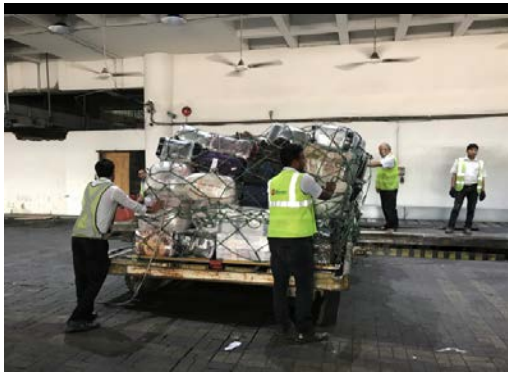


Photo 2.4-44 Baggage on the Pallet

(3) Lost & Found

- PTB1 lost and found service counter is located next to turn table #1
- LF staff provides lost and found services such as advising to hold if on hand.
- Baggage storage rooms are well organized in tidy manner
- At the time of the survey, 40 to 50 baggage are stored.
- Normally at other airports, the staff clears customs of baggage arrived later on behalf of the passenger to deliver it to passenger's home or hotel. At HSIA due to customs regulation, customs clearance of the baggage on behalf of the passengers are not allowed. Passengers have to come back to the airport to clear it with the customs themselves. This is unusual handling and causes much inconvenience for the passengers

2.4.11 Ramp Service

(1) GSE Hanger

The hanger is located next to aircraft maintenance hangar. It is staffed with GSE maintenance and administration sections. The administration office is located on the second floor.



Photo 2.4-45 Aircraft Maintenance Hanger



Photo 2.4-46 GSE Hangar

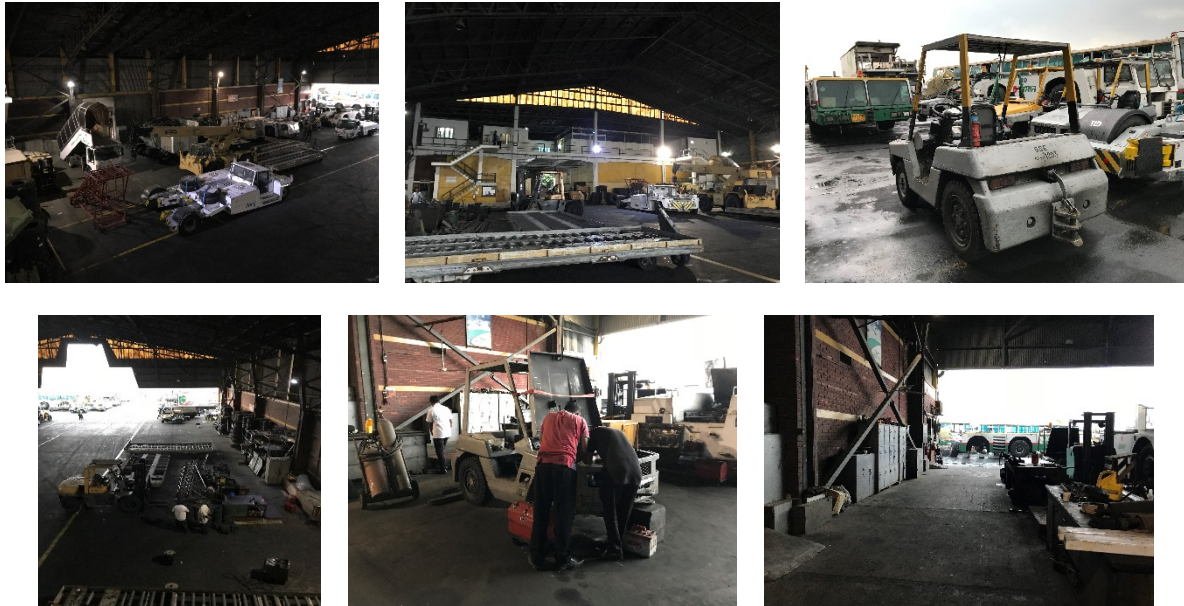


Photo 2.4-47 Inside of GSE Hangar

Table 2.4-4 GSE Hangar of Biman Airlines

No		ft ²	ft ²
1	Schedule maintenance office room	448	2,688
	Schedule maintenance Working area	2,240	
2	Battery shop (Battery Charger X 02)	515	515
3	Non-motor office area	160	2,565
	Non-motor working area	2,405	
	Drill machine X 02, Grinding machine X 01, Hydraulic press X 01, Welding machine X 01		
4	Tire shop office area	180	2,808
	Tire shop working area (Air compressor X 02)	2,628	
5	Electric shop area	344	344
6	Tools store area	841	841
7	Overhauling shop area	865	865
8	Maintenance control room area	468	5,868
	Maintenance control working area	5,400	
Total (ft ²)		16,494	16,494
Total (m ²)			1533,942

Source: Biman Airlines

(2) GSE Equipment

Table 2.4-5 is a list of the currently ownership of GSE equipment.

The base interval of regular inspection term is 3 months. However, there are equipments with 6 or 9 month of interval regarding its characteristic. A short interval have been set for frequently used equipment and equipment with high load. For example, the interval of inspection for toeing tractor is a month and a week for push back tractor. Also the extra inspection is being conducted at operation of per 100 hours, 500 hours, and 1,000 hours.

Table 2.4-5 GSE Equipment List (as of March, 2018)

No	Nomenclature	Current status				Plan			
		Total Equipment Include BER	Qty. serviceable	Qty. Unserviceable At present	Remarks	Total Equipment Include BER	Qty. serviceable	Qty. Unserviceable At present	Procurement Plan
1	Air Start Unit	06	03	03		10	07	03	Mar, 2018
2	Air Conditioning Unit	07	03	04		07	03	04	
3	Ambulance Lift	02	02	00		02	02	00	
4	Belt Loader	19	15	04		19	15	04	
5	Catering High Lift	10	07	03		10	07	03	
6	Container Pallet Loader	20	12	08		20	12	08	
7	Container Pallet Transporter	20	10	10		20	10	10	
8	Crane	01	01	00		01	01	00	
9	Delivery Van	01	00	01		01	00	01	
10	Flush Cart	06	03	03		06	03	03	
11	Fork Lift	13	09	04	For Cargo	13	09	04	
12	Ground Power Unit	19	12	07		28	21	07	Aug, 2018
13	Narrow Aisle Stacker	10	05	05	For Cargo	16	11	05	Mar, 2018
14	Push Back Tow Tractor	11	05	06		13	07	06	Apr, 2018
15	Passenger Steps	09	08	01		09	08	01	
16	Ramp Coach	12	09	03		14	11	03	Aug, 2018
17	Tow Tractor Baggage	40	31	09	8 tractors for cargo	53	44	09	Jun, 2018
18	Water Cart	07	03	04		07	03	04	
	Total	213	138	75		249	174	75	+36
	Ratio (%)		64.89%	35.21%			69.88%	30.12%	

Source: Biman Airlines

* Unserviceable GSE includes those to be disposed or auctioned off due to unreparable damage. Beyond economy repair (BER) occupies 30% of the unserviceable.

Table 2.4-6 List of ULD and Tow Bar

		2010-11	2011-12	2014-15	2015-16	2017-18	Total
ULD	LD-3 Container	200		100	300	300	900
	ALF Container			100			100
	Pallet		100	100			200
	Container Dolly		125		200		325
TOW BAR	B747	5				300	5
	DC10	4					4
	A310	3					3
	A320	4					4
	B757	4					4
	B737		3	3			6
	Universal Tow Bar (DASH8-Q400)			4			4
						3	3
	Tronair Tow Bar					2	2

Source: Biman Airlines



1. Air Start Unit, 11 Flush Cart



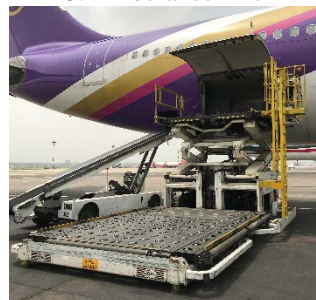
3. Ambulance Lift



4. Belt Loader



5. Catering High Lift



6. Container Pallet Loader



7. Container Pallet Transporter



12. Ground Power Unit



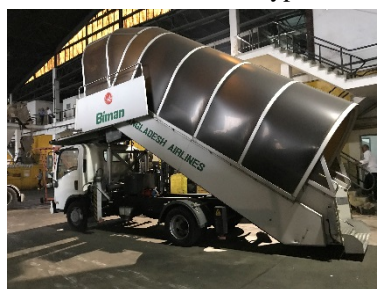
13. Push Back Tow Tractor
With Tow Bar Type



14. Tow Barless Type



15. Passenger Steps



With Canopy Type



16. Ramp Coach



17. Tow Tractor Baggage

18. Water Cart

LD-3 Container

ALF Container

Photo 2.4-48 GSE

(3) Ramp Handling Service

1) Overview of GSE Services

Biman Airlines provides the following ramp service necessary for aircraft operation.

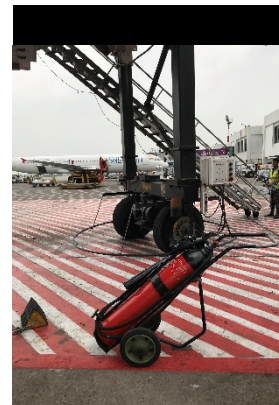
- FOD Check
- Preparation of Equipment
- Chocks, Safety Cones, Fire Extinguisher, GSE etc.
- Marshalling by CAAB
- Interphone Service by Maintenance Department
- Aircraft Parking
- PBB Operation by CAAB
- Passenger Step Car Operation
- Passenger Door Operation by Biman Airlines Cabin Crew
- GPU Operation
- Cabin Air Conditioning Operation
- Toilet Service
- Water Service
- Cargo Door Operation
- Loading/Unloading Device Operation
- Baggage Delivery Services
- Cargo Delivery Services
- Air Starter Unit Operation
- Towing
- Wing Mark by Maintenance Department.



Chocks



Safety Cones



Fire Extinguisher

Photo 2.4-49 Preparation Equipment



Photo 2.4-50 Interphone Service



Photo 2.4-51 Set-up Tow Bar for Towing

2) Observation on Ramp Services

Operation status of Handling is as follows.

- Operation of PBB takes longer than the standard time due to the lack of skills of the operator.
- PBB auto adjuster does not function properly.
Rainfall comes through a gap between the aircraft and PBB canopy due to the canopy malfunction.
- Two hours delay of MH flight was caused due to the intrusion of many mosquitoes into the cabin through holes in the canopy.
- The dolly is left without brakes and poses as the potential cause of aircraft damage (in the past three aircraft damage cases that took place).
- Inappropriate container handling.
- Container is left unlocked on the dolly posing a potential cause of aircraft damage.
- Empty containers are left on the ground on the ramp area, posing a potential cause of accidents as the container can be blown off by strong winds

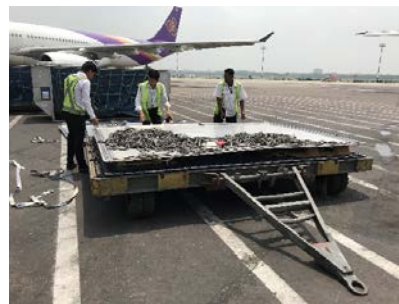


Photo 2.4-52 Empty Container is Left Unattended

- Regarding vehicle driving in the ramp, over speeding is not observed but further survey needs to be conducted on safety measures such as stopping the vehicle as the aircraft approaches.
- Regarding staff clothes, all the staff wear safety vests as required by the regulations. As for safety shoes and gloves, some do not observe the rules.
- Regarding baggage offloading, the bulk aircraft handlers seem to lack a sense of care as they are spotted dropping and throwing the baggage.
- Staffs are seen offloading baggage directly from the open cargo door without using the belt loader vehicle. This happened in the handling of arrival aircraft for entrusted airlines. This handling shows the lack of vehicle and staff.



Photo 2.4-53 Baggage is Offload to Palette

- During departure handling of an entrusted airline, 10 minutes delay is observed upon door close due to the delay in arrival of the push back tractor. This scenario causes further delay of the arrival aircraft waiting for a vacant spot. It appears that the shortage of the push-back tractor is the root cause of flight delay.
- It is observed that the pillars of the sorting area were damaged with scars by the dolly vehicle driven carelessly by handlers. For this case, the damaged dolly also needs repair.



Photo 2.4-54 Damaged Pillars

- Discarded GSEs are left unattended at several locations of the terminal building. Those are unusable push-back tractors and broken tow-bars.



Photo 2.4-55 Discarded GSEs are Left

- Container storage yard conditions:
Broken and old containers are left on the ground with the doors open, old pallets are piled on the ground while used nets and ropes are left on the grounds. Some parts of the container storage area seem to be garbage dumps with broken equipment and old items without any management for tidiness. For ramp safety, there is an urgent need for the management to clean up the mess in the ramp area and maintain the area in clean and tidy conditions.



Photo 2.4-56 Container Yard

- It is observed that pallet dolly is used to offload baggage from the bulk, posing damage for aircraft damage.

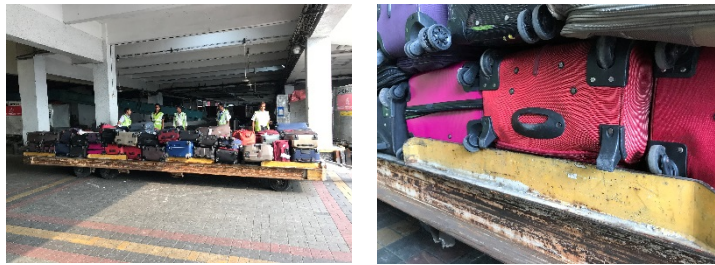


Photo 2.4-57 Baggage is Being Built-up on Pallet

- At the departure sorting area, it is observed that handlers throw baggage around and take the baggage down from the pile of the baggage to the belt or the ground.

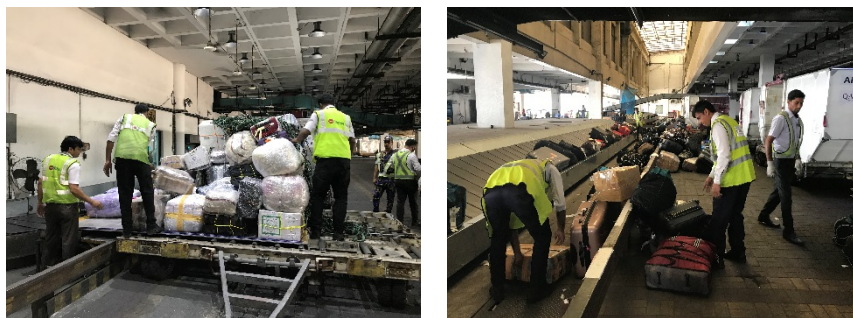


Photo 2.4-58 Working at Sorting Area

- During departure sorting work, it is observed that while eight staff are assigned to handle two flights of Biman Airlines (one large and one small aircraft), only four of the staff are assigned to handle two flights (one large and one small aircraft) of foreign airlines. Because there is a shortage of staff dispatched by Biman Airlines for handling of foreign airlines', the foreign airlines have to assign own staff for the handling of their flight as they cannot secure necessary handling personnel from Biman Airlines.



Photo 2.4-59 Baggage Handling of Biman Airlines Flights



Photo 2.4-60 Baggage Handling of Foreign Airlines

2.4.12 PBB

The ATC assigns bays (spot) for the flights in accordance with the airline’s request. All the airlines request for PBB spots. There are total of 29 bays. The PBB bays are only eight, from Bay 4 to Bay 11. Narrow body aircrafts such as the B737 is assigned to Bay 4 and Bay 11 while wide body aircrafts such as the B777 and A330 are assigned to Bay 4 through Bay 11. It appears that the ATC does not have PBB allocation guidelines in accordance with the airlines flight schedule. All the airlines requests for PBB spots.

The following survey was conducted in relation to PBB assignment. The percentage of PBB bay assignment out of the total departure and arrival flights was 63.13%, and the figure for the foreign airlines was 82.99%.

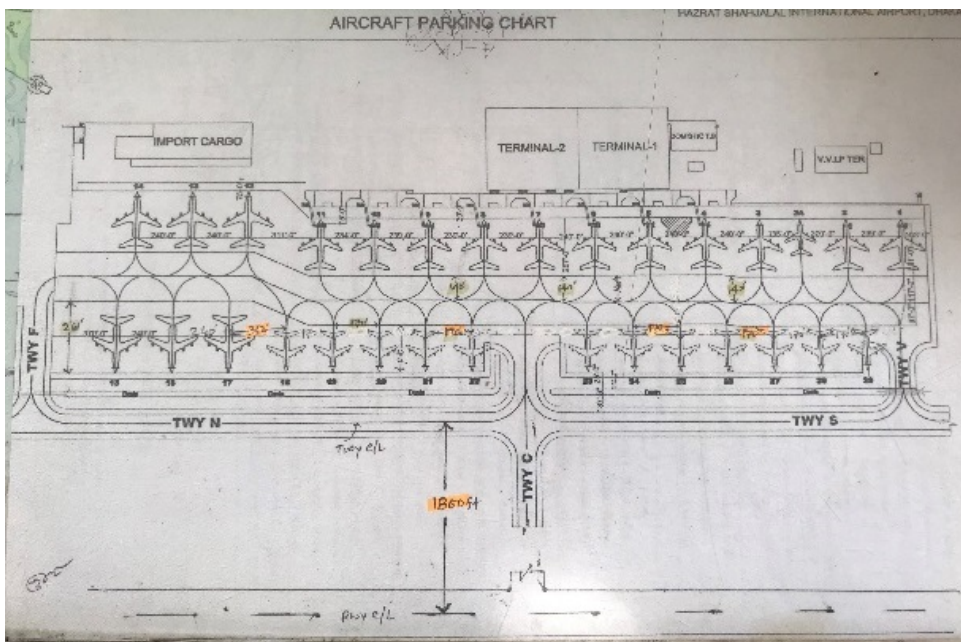


Photo 2.4-61 Spot for Aircraft

Table 2.4-7 PBB Assign Situation

	Airlines		Total
	Bandladesh	Foreign	
PBB Assign	5	33	38
Remote Assign	14	4	18
PBB Assign Ratio	26.32%	89.19%	67.86%

	Airlines		Total
	Bandladesh	Foreign	
PBB Assign	2	33	35
Remote Assign	16	5	21
PBB Assign Ratio	11.11%	86.84%	62.50%

	Airlines		Total
	Bandladesh	Foreign	
PBB Allocation	5	28	33
Remote Allocation	14	6	20
PBB Assign Ratio	26.32%	82.35%	62.26%

	Airlines		Total
	Bandladesh	Foreign	
PBB Allocation	3	27	30
Remote Allocation	11	10	21
PBB Assign Ratio	21.43%	72.97%	58.82%

	Airlines		Total
	Bandladesh	Foreign	
PBB Allocation	10	61	71
Remote Allocation	28	10	38
PBB Assign Ratio	26.32%	85.92%	65.14%

	Airlines		Total
	Bandladesh	Foreign	
PBB Allocation	5	60	65
Remote Allocation	27	15	42
PBB Assign Ratio	15.63%	80.00%	60.75%

	Airlines		Total
	Bandladesh	Foreign	
PBB Allocation	15	121	136
Remote Allocation	55	25	80
PBB Assign Ratio	21.43%	82.88%	62.96%

Source: JICA Study Team

2.4.13 On Time Performance (OTP)

The OTP rate of HSIA in 2017 was "61.4%". OTP for main airlines are shown in Table 2.4-8.

Table 2.4-8 OTP of Biman Airlines

Period	OTP (within 15 minutes)
Sep, 2017	46%
Oct, 2017	49%
Nov, 2017	69%
Dec, 2017	34%
Jan, 2018	33%
Feb, 2018	42%

Source: Biman Airlines

Causes for delay attributable to the airport (per Biman Airlines comments)

- Shortage of PBB
- Shortage of number of check-in counters
- Congestion and delay at gate security checks
- Congestion and delay at departure immigration checks
- Unexpected Notam (Military. VIP etc.)

Causes for delay attributable to Biman Airlines handlings (per Biman Airlines comments)

- Staffing shortage at Biman Airlines
- Shortage of GSE
- Shortage of aircraft (aircraft maintenance factor)
- Arrival delay of the pilot at the airport due to traffic congestion

Table 2.4-9 OTP of Foreign Airlines at HSIA

Airlines	OTP at HSIA	Delay Reason
Air Arabia (G9)	Average: 40%	Shortage of ramp equipment
Air India (AI)	Last 5 years: 65% 2018: 90%	Shortage of ground handling manpower and equipment
Emirates Airline (EK)	Average: 60%	N/A
Gulf Air (GF)	2016~2018: 95 % Past: 90 %	Shortage of ground handling manpower and equipment
Kuwait Airways (KU)	Average: 95 %	Shortage of ground handling manpower and equipment
Saudi Arabian Airlines (SV)	N/A	Shortage of ground handling manpower and equipment. Late act clearance from tower

Source: JICA Study Team

2.4.14 Passenger Terminal Management

(1) Tenant Management

The summary of current situation & issues is shown in Table 2.4-10.

Table 2.4-10 Summary of Current Situation & Issues

Item	Content
Attracting Tenants	<ul style="list-style-type: none"> → Tenders for new shops are invited and selected by head office. HSIA staff have no decision-making authority → They play no part in leasing (attracting interest) and do not create any marketing materials for that purpose → Proposals for new shops and retail areas which will increase revenue have been received but have been turned down as a matter of airport policy due to concerns that the proposals may encroach on passenger space
Management Report	<ul style="list-style-type: none"> → Control of the tenant area is under the direct management of the CAAB. However, being under the authority of the head office's Estate Department, there are no full-time staff stationed at the airport (Photo 2.4-62) → There are 101 stores in total → One characteristic is the very limited number of restaurants (no proper eateries set up in the public areas, only cafes) (Photo 2.4-63) → Retail and duty-free shops are operated by local tenants only and there are no global brands (Photo 2.4-64)

Source: JICA Study Team



Photo 2.4-62 Airside



Photo 2.4-63 Restaurants Inside the Airside



Photo 2.4-64 Shops in the Airside

The summary of contractual relationships are shown in Table 2.4-11

Table 2.4-11 Contractual Relationships

Item	Content
Contractual relationships	<ul style="list-style-type: none"> → Contracts with individual tenants are renewed annually → Contract format involves rents based on floor space (no sales-based commissions set) → Renewal is granted to companies able to pay rents 10% higher than the previous period (incidentally, the cake shop at one side of Terminal 1 has continued its lease for 20 years) → Monthly rent for leases are 240BDT/m² for air-conditioned and 160BDT/m² for non-air-conditioned spaces (1BDT = approx. 1.3 yen)
Sales management	<ul style="list-style-type: none"> → Given that tenancy fees paid by tenants to the CAAB take the form of rents based on floor space, the CAAB does not deem it necessary to know the sales amounts of individual tenants ('no reason to become involved in their business' is the adopted stance) → Sales management system has not been introduced → As such, there is no grasp of sales figures
Tenant Management	<ul style="list-style-type: none"> → Communication with tenants is not done on an individual basis, but rather at bi-monthly meetings also attended by non-tenant business operators within the airport → Management of lease lines involves an established penalty which denies ID renewal to infringing tenant staff
Sales Promotion	<ul style="list-style-type: none"> → No sales promotion activities undertaken

Source: JICA Study Team

(2) Lease Management

1) Check-in Counters

The current operation situation of check-in counters is shown in Table 2.4-12.

Table 2.4-12 Operation of Check-in Counters

Item	Content
Contracts	<ul style="list-style-type: none"> → CAA According to the CAAB, check-in counter rents have historically not been collected from airlines (Biman Bangladesh Airlines (Biman Airlines) insists that these are included in other fees, such as aircraft parking charges and office rent) → CUTE details are unclear due to direct contract between Biman Airlines and SITA, without HSIA involvement
Operations	<ul style="list-style-type: none"> → Check-in counter peak usage periods are mornings, 17:30~21:30 and late at night → Check-in counters are common use; the CAAB manually creates counter management tables based on airline flight schedules → The CAAB has the authority to assign counters, and does so according to the management tables → The CAAB establishes the rules for check-in counter operation → As identified during site inspection and meetings with Biman Airlines, the spaces in front of check-in counters are cramped and often become congested (Photo 2.4-65) → Even when counters are not in use, stanchions and class signage (SQ) remain set up in front of check-in counters (Photo 2.4-66, Photo 2.4-67) → Passenger handling is universally entrusted to Biman Airlines for foreign airlines, while domestic airlines each handle their own → Being the largest customer with services operating throughout the day, Biman Airlines is assigned Counters D and E (London-bound flights are assigned to the ends as they require special security procedures) (Photo 2.4-68) → <u>The most unpleasant factor affecting Biman Airlines services is the presence of mosquitos</u> (appear within passenger terminals, at times also entering aircraft. Severe cases have even caused delays of as much as two-hours)

Source: JICA Study Team



Photo 2.4-65 Crowded Check-in Counter



Photo 2.4-66 Abandoned Stanchions

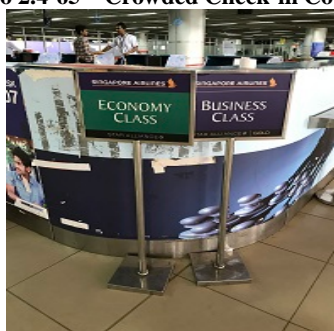


Photo 2.4-67 Abandoned Class Signage



Photo 2.4-68 Row D

2) Office Area

The current operation situation of office area is shown in Table 2.4-13.

Table 2.4-13 Current Situation of the Office Area

Item	Content
Contracts	<ul style="list-style-type: none"> ➔ Monthly rates for lease contracts: CAAB/airlines - 120BDT/m² for air-conditioned, 80BDT/m² for non-air-conditioned spaces Other businesses (incl. tenants) - 240BDT/m² for air-conditioned, 160BDT/m² for non-air-conditioned spaces ➔ All contracts are renewed annually, with a 10% rate increase at every renewal
Operations	<ul style="list-style-type: none"> ➔ The entire office area, including toilets, hallways and rooms, is so untidy as to appear outside the scope of cleaning duties (Photo 2.4-69) ➔ Materials are piled up in front of airline offices (Photo 2.4-70) ➔ Bulky refuse, unused chairs and desks are piled in hallway corners (Photo 2.4-71) ➔ Waste materials are left in hallways (Photo 2.4-72) ➔ Toilets for the exclusive use of staff are extremely dirty (Photo 2.4-73) ➔ Rubbish is scattered in various places, hallways and office rooms are terribly dirty (Photo 2.4-74)

Source: JICA Study Team



Photo 2.4-69 Floor surface where Dirt Stuck



Photo 2.4-70 Piled up Materials in front of Airline Offices

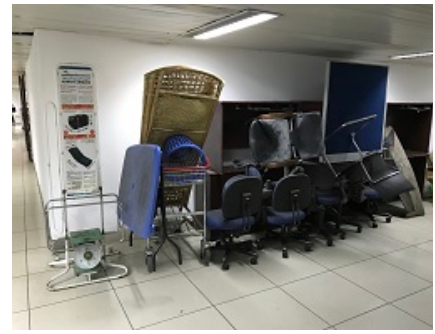


Photo 2.4-71 Unused chairs and Desks in Hallway Corners



Photo 2.4-72 Waste materials in hallways



Photo 2.4-73 Toilets in the Office Area



Photo 2.4-74 Scattered Rubbish on the Roof of the Terminal Building

(3) Terminal Services

1) Public Passenger Areas

The current operation situation of public passenger areas is shown in Table 2.4-14.

Table 2.4-14 Facilities: Public Passenger Areas

Item	Content
Facilities	<ul style="list-style-type: none"> ➔ Toilet signs are large and easy to recognize (Photo 2.4-75) ➔ Children's play areas are planned for the airside (Photo 2.4-76) ➔ Although there are six terminal entrances, only four are currently in operation due to staff shortages (passenger use: 3, staff: 1). Plans to hire 300 staff within one month and utilize all six gates (Photo 2.4-77) ➔ Baggage carts are plentiful in both the departure and arrival lobbies (although 2,000 have been purchased, this is apparently inadequate during peak periods) (Photo 2.4-78) ➔ Free mobile phone charging stands installed in the arrival lobby (Photo 2.4-79Photo 5.4 71) ➔ Few information counters, with only one each in the departure and arrival lobbies (Photo 2.4-80) ➔ The Hajj Counter operated by the CAAB is the only information counter in the departure lobby, with no general information counters (future plans to establish two each in the general and restricted areas) ➔ Three companies currently offering free Wi-Fi ➔ Two types of so-called 'customer feedback' boxes - the CAAB's Complaint Box and Biman Airlines' Comments Box – both with negative names that do not encourage positive comments (Photo 2.4-81) ➔ Only one smoking area within the airport (public area) (Photo 2.4-82)

Source: JICA Study Team



Photo 2.4-75 Large Toilet Signs (to be recognized easily)



Photo 2.4-76 Kids' Space (planned place)



Photo 2.4-77 Departure Lobby Entrance



Photo 2.4-78 Baggage Carts



Photo 2.4-79 Free Mobile Phone Charging Stands



Photo 2.4-80 The Hajj Counter in the Departure Lobby



Photo 2.4-81 CAAB's Complaint Box



Photo 2.4-82 Smoking Area

Table 2.4-15 Operations: Public Passenger Areas

Item	Content
Operations	<ul style="list-style-type: none"> ➔ At first impression, areas visible from lines of passenger flow (including toilets) appear to be cleaned thoroughly (the CAAB instructs contractors to 'clean constantly around the clock'. One staff member is assigned to each toilet) (Photo 2.4-83) ➔ Rubbish and unused carts, desks, chairs and stanchions are scattered in corners of the departure lobby or areas not visible from lines of passenger flow (Photo 2.4-84 & Photo 2.4-85) ➔ Rubbish bins overflow with waste - regular collection required (Photo 2.4-86) ➔ The aim of the Hajj Counter is to assist 'travelers unaccustomed to airports' who visit during seasonal pilgrimages; the counter mainly provides explanations of airport facilities and the departure flow beginning with check-in procedures ➔ Manuals and guidelines exist for providing information at the Hajj Counter (handling of VIPs, assisting disadvantaged individuals, contacts for facility faults, directions to destinations, etc.) ➔ Hajj Counter staff are all male (in accordance with Bangladeshi custom, women refrain from being seen in public) ➔ While baggage carts were previously also provided on the airside, they are currently limited to landside due to a shortage of retrieval staff ➔ Passenger comments/feedback are retrieved from Complaint Boxes within the airport once a month, presented to the airport director, then submitted to the Ministry ➔ Lost baggage is stored at two locations on the airside and on the landside. Items are kept for 21 days, then handed to Customs after one month (Photo 2.4-87) ➔ Storage locations are littered with rubbish (Photo 2.4-88) ➔ No management of access to office areas, allowing anyone to come and go (Photo 2.4-89) ➔ Advertising is installed throughout both the international and domestic passenger terminals. Plan to check the handling of advertising in the next survey (Photo 2.4-90-Photo 2.4-93) ➔ SAMSUNG TV advertisement set up in the domestic departure lobby (Photo 2.4-94) ➔ There are many dead spaces and areas that could be utilized effectively, such as for new shops, advertising, staff rest rooms, etc. (Photo 2.4-95 & Photo 2.4-96)

Source: JICA Study Team



Photo 2.4-83 (Where you can see) an Orderly Departure Lobby



Photo 2.4-84 Scattered Rubbish and Unused Carts, Desks, Chairs and Stanchions in Corners of the Departure Lobby



Photo 2.4-85 Scattered Carts



Photo 2.4-86 Overflowing rubbish bin



Photo 2.4-87 Lost baggage storage room



Photo 2.4-88 Lost baggage storage room where the garbage is scattered



Photo 2.4-89 The top of the Stairs is the Office Area



Photo 2.4-90 International Airside



Photo 2.4-91 International Airside



Photo 2.4-92 Passenger Boarding Bridge



Photo 2.4-93 Domestic Departure Lobby



Photo 2.4-94 Samsung's ad TV



Photo 2.4-95 Third Floor Landing



Photo 2.4-96 Airside

2) Car Parks

The operation of car parking is explained below;

- Use of the single-level car park costs 80BDT for the first three hours, and 30BDT for every subsequent hour. Tickets stamped with entry times are handed out at the entrance, and charges paid at the exit. (Photo 2.4-97)
- The car park closest to passenger terminals is designated for government personnel, despite low utilization. Given that VVIP and VIP terminals also exist, this could be converted to a car park for general customers with higher rates that could raise non-aeronautical revenues. (Photo 2.4-98)



Photo 2.4-97 Parking Entrance



Photo 2.4-98 Government Official Private Parking Lot



Photo 2.4-99 Inside Multistory Parking Lot

2.4.15 Terminal Facilities Maintenance and Management

The current situation of terminal facilities maintenance and management is shown in Table 2.4-16.

Table 2.4-16 Terminal Facilities Maintenance and Management

Items	Contents
Organization Framework	<ul style="list-style-type: none"> ➔ The management of maintenance on structural facilities at Hazrat Shahjalal International Airport is the responsibility of the Civil Division-(HSIA) within the Civil Circle. ➔ The management of maintenance on mechanical and electrical equipment at Hazrat Shahjalal International Airport is the responsibility of Electrical & Mechanical-I (HSIA) within the Electrical & Mechanical Circle. Within this, 12 electricians are in charge of lighting and the fire alarm system. ➔ The management of maintenance on passenger boarding bridges at Hazrat Shahjalal International Airport is the responsibility of Boarding Bridge (HSIA) within the Electrical & Mechanical Circle. ➔ The management of maintenance of communications equipment at Hazrat Shahjalal International Airport is the responsibility of the Station Communication Section at Hazrat Shahjalal International Airport. ➔ Elevator, escalator, air conditioning and automated fire alarm equipment work is outsourced. ➔ Although Xebec Trading Services is contracted for automated fire alarm equipment, the company does not have an office within the airport. ➔ CAAB does not have sufficient staff. Because of the time it takes to recruit new full-time staff and the high cost of wages, work on some equipment is outsourced. ➔ Work on air conditioning and electrical plant, baggage handling systems and automatic fire alarm systems is outsourced to the installing manufacturer. Maintenance of important facilities (such as the main substation) is supervised by CAAB rather than being outsourced. ➔ There are 4 companies contracted for work on air conditioning and 5 for work on the baggage handling systems. The placement of orders for expansion or refurbishing works must be done by public tender for each project and the orders are allocated to different manufacturers. Therefore, contracts must be signed with multiple manufacturers. ➔ This becomes a time and labor consuming process for CAAB. It would be better to change to a system in which CAAB could contract with one specific company, which would then subcontract out all of the work activities. ➔ On the subject of staff numbers, a decision has been made to provide 2,500 more staff for the 9 airports operated by the Bangladesh government. In addition to that, the number of staff required for the commissioning of Terminal 3 at HSIA is still under consideration. Once that has been given due consideration, it is expected that another request for staff will be put to the government. ➔ The staff in the existing Terminals 1 and 2 know nothing about the equipment in Terminal 3 (only those involved with Terminal 3 have any knowledge).

Items	Contents
Facilities and Equipment (1)	<ul style="list-style-type: none"> ➔ There are few information signs in the passenger terminals. Due to the problems shown below, we are concerned that passengers do not know where to go. ➔ There are no signs in the departure and arrival lobbies showing the layout, so passengers do not know where anything is. ➔ Check-in counter signs do not stand out, so passengers do not know where to check in. (Photo 2.4-92) ➔ FIDS screens in the departure lobbies are too small and difficult to see. (Photo 2.4-93) ➔ Not enough information on connections between the domestic and international terminals. (Photo 2.4-94) ➔ The following improvements are being made to way-finding. <ul style="list-style-type: none"> ✓ Photo 2.4-95: Displays are to be mounted on individual check-in counters. ✓ Larger FIDS screens will be installed. (Photo 2.4-96) ✓ Curbside displays will be installed showing the check-in counters for the individual airlines. ✓ Video guides to airport facilities will be screened on SAMSUNG advertising displays. (Photo 2.4-97100) ➔ All of the facilities and equipment were manufactured overseas, and spare parts must be purchased in advance because they are not available in Bangladesh. ➔ The following describes air condition plant at present. ➔ Although air conditioning plant is old, it is fully operational. (Photo 2.4-98) ➔ Inspection equipment (it is not clear if this is provided by CAAB or the contractors) is in the care of the contractors and is poorly looked after. (Photo 2.4-99) ➔ The inventory is under the control of the CAAB and is managed properly so that inventory requests are submitted by contractors to the CAAB department in charge of air conditioning equipment and then passed on to the CAAB department in charge of the inventory. We assume that contractors also have inventories under their control separate to the inventory managed by the CAAB. (Photo 2.4-100) ➔ There is an annual service and maintenance program (items costing more than BDT100 million (approx. JPY130 million) come under separate CAAB and MOCAT programs) but there are no mid-term or long-term programs. (Photo 2.4-104) ➔ Facilities and equipment that are no longer in use are disposed of by contractors selected by public tender by the Bangladesh government. It seems that tenders are only called after a certain level of items to be disposed of have been amassed and there are mountains of obsolete equipment everywhere. (Photo 2.4-105)

Source: JICA Study Team



Photo 2.4-101 Departure Lobby



Photo 2.4-102 Small FIDS Screen



Photo 2.4-103 Connection Information

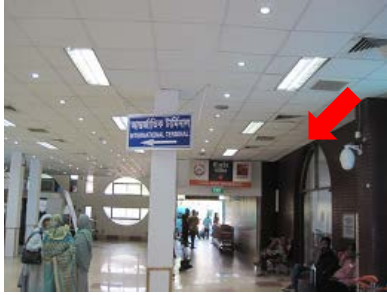


Photo 2.4-104 Check-in Counter Display



Photo 2.4-105 Larger FIDS Screen



Photo 2.4-106 SAMSUNG Advertising Display



Photo 2.4-107 Air Conditioning Plant



Photo 2.4-108 Management of Inspection Equipment



Photo 2.4-109 Management of Inventory (CAAB)



Photo 2.4-110 Management of Inventory (CAAB)



Photo 2.4-111 Management of Inventory (CAAB)



Photo 2.4-112 Management of Inventory (CAAB)



Photo 2.4-113 Annual Service and Maintenance Program



Photo 2.4-114 Mountain of Obsolete Equipment

The current situation of terminal facilities maintenance and management is shown in Table 2.4-17.

Table 2.4-17 Terminal Facilities Maintenance and Management

Items	Contents
Facilities and Equipment (2)	<ul style="list-style-type: none"> ➔ A single automatic fire alarm system (comprising 11 main console panels and 38 sub panels) covers PTB, TWR, VVIP and other facilities but because the system has no central monitoring equipment, monitoring is done directly through the main and sub panels by on-site staff. Given the fact that integrated monitoring from a central system would be more efficient in terms of facility operating and maintenance, we are yet to confirm that such a system will be included in the Terminal 3 designs. (Photo 2.4-115 and Photo 2.4-116) ➔ On checking the passenger terminal electrical plant rooms, wiring is not properly managed. The rooms are also littered with garbage. (HSIA has 48 electrical plant rooms.) (Photo 2.4-117 and Photo 2.4-118) ➔ Electrical wiring has been left exposed in corridor ceilings in the office area (Photo 2.4-119) ➔ Tools and waste materials are left scattered around the sorting areas and not properly put away. (Photo 2.4-120 and Photo 2.4-121)

Source: JICA Study Team



Photo 2.4-115 Main panel



Photo 2.4-116 Sub panel



Photo 2.4-117 Wiring in electrical plant room



Photo 2.4-118 Garbage littering electrical plant room

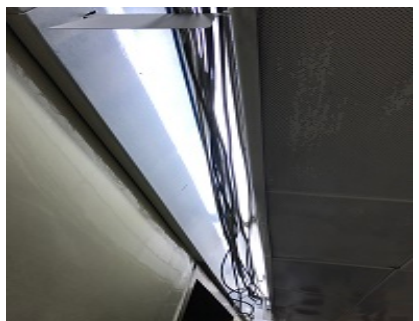


Photo 2.4-119 Corridor ceiling in the office are



Photo 2.4-120 Beside the sorting area



Photo 2.4-121 Inside the sorting area

The current situation of terminal facilities operation and maintenance is shown in Table 2.4-18.

Table 2.4-18 Terminal Facilities Operation & Maintenance

Items	Contents
Facilities and Equipment (2)	<ul style="list-style-type: none"> ➔ Viver (an application service) was introduced about 8 months ago to share information on the status of facilities and malfunctions, etc. This has made it possible for information to be shared effectively with relevant personnel so that malfunctions could be dealt with swiftly. (Photo 2.4-122) ➔ Lighting maintenance personnel record inspection results and other information on personal notebooks and there is no standardized check sheet. (Photo 2.4-123) ➔ We understand that manuals exist, but we have not been able to confirm that. We have also heard that training overseas is provided but we have not been able to sight any training programs or other supporting data. ➔ Three 8-man teams of CAAB personnel in charge of electrical systems (lighting and fire alarm) are stationed around the clock in the Combined Complain Center. All HSIA information comes into the Center. CAAB teams respond to malfunctions in lighting and fire alarm systems and they notify the relevant departments for all other problems. Situations are logged in notebooks (response logs.) (Photo 2.4-124) ➔ Replacement fluorescent tubes were available in the Combined Complain Center, but we do not believe that they were stored and managed properly. (Photo 2.4-124) ➔ Manuals are compiled according to need only during ICAO audits and there are basically no manuals (written manuals) compiled by the CAAB, only manufacturers' manuals. Maintenance is carried out in accordance with the recommendations of the manufacturers. ➔ The CAAB wants to make Terminal 3 better than the existing Terminals 1 and 2. Therefore, they want recommendations for improvements in the management of Terminal 3 from Japan and to discuss those recommendations when they come out (there have been no specific discussions concerning the management of Terminal 3, so it seems that there is nothing under consideration).

Source: JICA Study Team

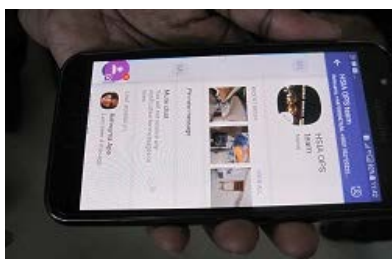


Photo 2.4-122 Viver Screen



Photo 2.4-123 Maintenance personnel notebook



Photo 2.4-124 Combined Complain Center



Photo 2.4-125 Spare fluorescent tubes

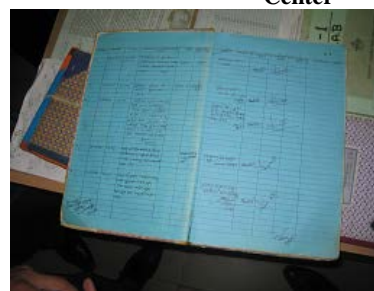


Photo2.4-126 Response log

The current situation of air conditioning equipments operation is shown in Table 2.4-19.

Table 2.4-19 Operation of Air Conditioning Equipment

Items	Contents
Facilities and Equipment	<ul style="list-style-type: none"> ➔ The four air conditioning plant contractors (3 chiller contractors and 1 package air conditioning contractor) are local companies on duty 24-hours a day. Two CAAB air conditioning equipment personnel supervise the 4 contractors. ➔ The contractor work locations are in the air conditioning plant room, which could not be described as an ideal environment. (Photo2.4-127) ➔ Only manufacturer manuals are available and are held by the contractors. ➔ Inspection check sheets are produced by the CAAB. We have not been able to check the inspection program and will do so during the next study. (Photo2.4-128) ➔ Training and education is not on a programmed basis but provided as required. We have not been able to check the training and education content in detail and will do so during the next study. ➔ A sufficient budget has been set aside for operations and maintenance. However, additional requests are submitted to the CAAB and MOCAT for expenditure incurred by major malfunctions. ➔ Malfunctions are recorded in notebooks (malfunction logs). (Photo2.4-129) ➔ Recommended air conditioning temperatures are 24°C to 25°C. There is no heating so temperatures in winter are between 15°C and 16°C.

Source: JICA Study Team



Photo2.4-127 Contractor work location (Air conditioning plant room)



Photo2.4-128 Contractor work location (Air conditioning plant room)

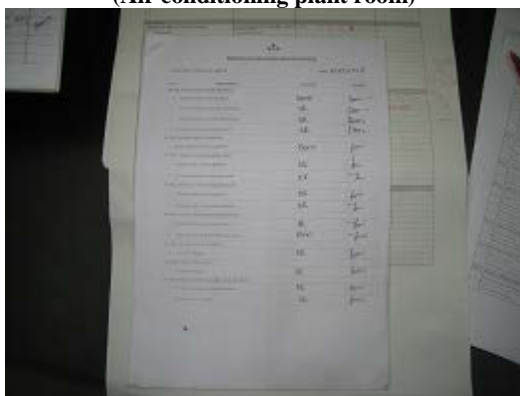


Photo2.4-129 Inspection check sheet



Photo2.4-130 Malfunction log

2.4.16 Customs and Immigration

(1) Immigration

1) Organization and Operation

Organization and operation status of immigration is as shown in Table 2.4-20.

Table 2.4-20 Organization and Operation of Immigration

Item	Content
Organization and operation	<ul style="list-style-type: none"> → Immigration Organization belongs to Department of Immigration & Passport, Security Service Division, Ministry of Home Affairs → Officer wear uniform with Immigration Police on a shoulder strap → There are three shifts of eight hours work on a per day for Immigration with 110~115 Staff on one work shift. (7:00~14:00, 14:00~22:00, 22:00~07:00) → Depending on working conditions, manpower shortage has occurred → Position changing policy at immigration control office for fraud prevention hinders immigration inspection officer from acquiring skills required for immigration control work.

Source: JICA Study Team

2) Departure Immigration

Operation Status of Departure Immigration is as shown in Table 2.4-21.

Table 2.4-21 Operation Status of Departure Immigration

Item	Content
Organization and operation	<ul style="list-style-type: none"> → Immigration entrance is three places. "Immigration 1", "Immigration 2", "Immigration 3" are displayed. "Immigration 2" is open only during congestion. → There are 7 booths / 14 examination places for 'Immigration 1', 6 booths / 12 examination places for 'Immigration 2', 5 booths / 16 examination places for 'Immigration 3' place. "Bangladeshi booth" and "foreign booth" are installed in half. → "PC", "camera for face recognition", "passport leader", etc. are installed at the examination place. → In the immigration control, the OS of the PC being used is "Windows XP". XP is an OS whose support is terminated, and Security is vulnerable. → After departure immigration, exit from the central exit, head for the departure lounge and concourse. At the central exit, confirmation of the completion of the examination by the immigration officer is carried out. → There are many Bangladeshi passengers who have incomplete entry of departure documents in immigration control and it takes unnecessary time for the review. → Peak time zone is late night. → Immigration examination room is narrow, and the lobby is overflowing permanently. → Space shortage occurred at departure terminal. In addition, functions necessary for passenger flow line overlap in a narrow space, they are disturbing each other, and as a result, it becomes "a space difficult to use" space, and a vicious cycle has occurred → Passengers waiting for check-in and used carts stay and sometimes block the entrance of immigration. → A departure document entry shelf is near the immigration entrance, and when the passenger stays, it blocks the immigration entrance → Passengers waiting for check-in heading for passport and departure examination place (or waiting for screening at the examination place) coexist and become crowded. → As the counter space is too small, as more than one airline secures the maximum space, it will be adjacent to the flow line to the immigration, resulting in closing the immigration entrance.

Source: JICA Study Team



Photo 2.4-131 Entrance of immigration 1



Photo 2.4-132 Entrance of immigration 2



Photo 2.4-133 Examination place



Photo 2.4-134 Confirmation of the completion of the examination by the immigration officer



Photo 2.4-135 A side view from the departure lobby



Photo 2.4-136 Cart is not organized



Photo 2.4-137 Crowded filling shelves



Photo 2.4-138 Check-in passengers and examination waiting passengers are mixed



Photo 2.4-139 Immigration entrance is blocked by check-in passenger

3) Arrival Immigration

Operation status of Arrival immigration is as shown in Table 2.4-22.

Table 2.4-22 Operation status of Arrival immigration

Item	Content
Organization and operation	<ul style="list-style-type: none"> ➔ Arrival floor when descending by escalator and stairs from concourse. Pass through the Human Quarantine inspection booth and reach at an immigration place. ➔ If you do not obtain a visa, apply and obtain at the Visa On Arrival (VOA) counter on the floor. ➔ The VOA counter is near the entrance to the immigration. ➔ The Arrival immigration is located in Terminal 1, and there are 12 booths / 48 examination places. There are 8 booths for Bangladeshis and 4 booths for foreigners. "PC" "camera for face recognition" "passport leader" etc. are installed in the examination booth. ➔ One booth on the left is for Diplomat, VIP, crew, staff only. ➔ The sign of Arrival exists only in one central part. ➔ Arrival card and passport are required at entry. ➔ By the field survey, for foreign immigration control, the "average of waiting time + immigration time" is "12.2 minutes", "the average of immigration time" is "5.1 minutes", and even if you have a visa, the process time is long. ➔ After the arrival immigration, exit from the central exit and head towards the Baggage turn belt. At the central exit, the immigration officer confirms the completion of the examination.

Source: JICA Study Team



Photo 2.4-140 Guidance board (after passing Human Quarantine inspection booth)



Photo 2.4-141 VOA counter



Photo 2.4-142 Bangladeshi booth



Photo 2.4-143 Foreigner's booth



Photo 2.4-144 Diplomat, VIP, crew, staff only booth

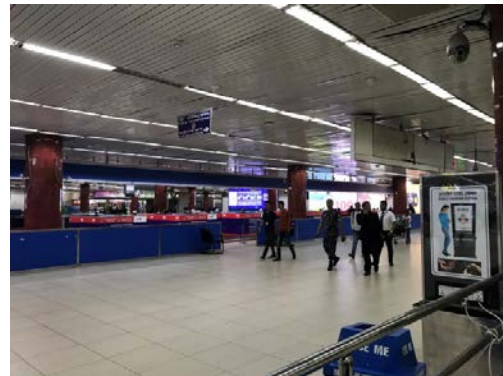


Photo 2.4-145 The center of the photo is the exits of Arrival immigration

(2) Customs

Operation status of Customs is as shown in Table 2.4-23.

Table 2.4-23 Operation Status of Customs

Item	Contents
Organization	<ul style="list-style-type: none"> → Customs organization belongs to Dhaka Custom House, National Board of Revenue, Ministry of Finance. → Depending on working conditions, personnel shortage has occurred.
Departure Customs	<ul style="list-style-type: none"> → Customs inspection at departure is not carried out. → Customs officer will conduct inspection at the gate when it is judged that customs inspection is necessary by security check at departure gate.
Arrival Customs	<ul style="list-style-type: none"> → In the customs inspection, first, "X-RAY inspection" is carried out, and in case it is necessary to confirm the contents, manual search is carried out at the inspection table. → The customs officer instructs the inspection at the entrance of the customs. Most of the inspections on foreigners have not occurred and the majority of the inspections are conducted in Bangladeshi. According to the field survey, the average was "2.7 minutes", even during peak hours "within 10 minutes", it was not a long-time inspection. → When arriving from Middle East, the proportion of Bangladeshi people is high, and the congestion of customs inspection sites becomes intense. → When instructed by the customs officer for inspection, head toward "X-RAY" on both sides. → If the inspection is not instructed by the customs officer, pass through the center and leave the customs area. → Since many commercial samples (such as textiles) are brought in, tax evasion is surely prevented. → They are strengthening the inspection of arrival flights from the Middle East / India / Singapore / Bangkok to prevent gold ingot smuggling. → There is an office of Dhaka Custom House on the opposite side to "X-RAY" → There is a tax counter at the back of the plant quarantine, implement necessary procedures for customs clearance and pay tax.

Source: JICA Study Team



Photo 2.4-146 X-Ray



Photo 2.4-147 Inspection Table for Manual Search

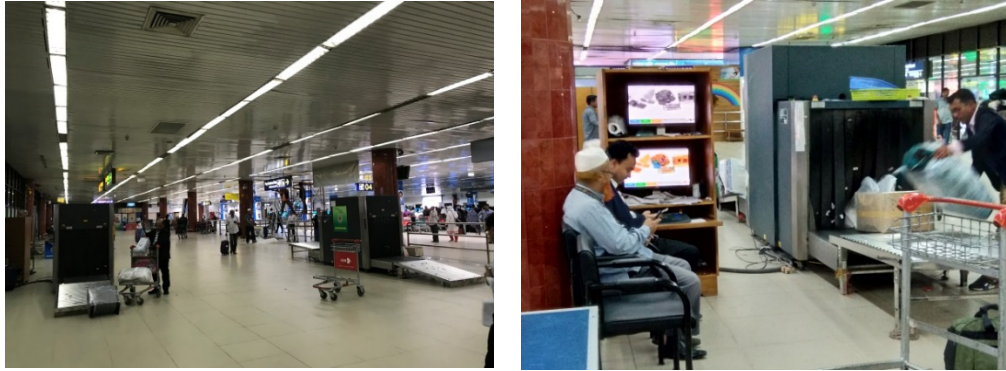


Photo 2.4-148 X-Ray

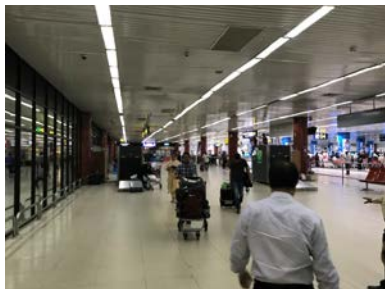


Photo 2.4-149 Way to Arrival Lobby



Photo 2.4-150 Plant Quarantine



(3) Quarantine

Operation status of Quarantine is as shown in Table 2.4-24.

Table 2.4-24 Operation Status of Quarantine

Item	Contents
Human	<ul style="list-style-type: none"> → Human Quarantine belongs to Ministry of Health & Family Welfare. → In order to prevent infectious diseases, they checked the arrival passenger's body temperature, and passengers whose body temperature exceeds "38 degrees" will be diagnosed separately. In particular, arrival flights from the Middle East are intensively checked to prevent Middle East respiratory syndrome (MERS).
Animal	<ul style="list-style-type: none"> → Animal Quarantine belongs to Plant Quarantine Wing, Department of Agricultural, Ministry of Agriculture. → There is an inspection booth at the arrival customs area.
Plant	<ul style="list-style-type: none"> → Plant Quarantine belongs to Bangladesh Animal and Animal Product Quarantine, Department of Livestock Services, Ministry of Fisheries and Livestock → There is an inspection booth at the arrival customs area.

Source: JICA Study Team



Photo 2.4-151 Human Quarantine



Photo 2.4-152 Animal Quarantine



Photo 2.4-153 Plant Quarantine

2.4.17 Others

(1) Hajj Flight

- Hajj Flight is operated for two months in total, one month prior to the pilgrimage and a month after the pilgrimage.
- The pilgrimage date is changing every year due to the Arabian calendar.
- The number of Hajj passengers is increasing at 10% to 15% every year.
- In 2017, a total 191 Biman Airlines flights transported 64,871 passengers and 179 Saudi Arabian Airlines flights transported 62,336 passengers.
- From Bangladesh, only Biman Airlines and Saudi Arabian Airlines are allowed to operate by the Saudi government
- Saudi Arabian Airlines passenger check-in at the HSIA and the collected baggage are stored outside the airport.
- Biman Airlines checked-in passengers and the baggage are collected at Ashkona Hajj camp site, a suburb of Dhaka. CIQ is performed at this site.
- Prior to the pilgrimage, Biman Airlines assigns 24 staff for passenger handling and 20 staff for baggage handling for a month at the camp site. Biman Airlines also dispatches 6-8 staff prior to the pilgrimage and 50 staff after the pilgrimage to Jeddah for flight handling. Staff shortage is observed at HSIA for this type of handling.
- Checked baggage is delivered from Gate 8 to the sorting area by a tractor.
- Passengers are delivered to the airport 2 hours prior to STD.
- Biman Airlines dispatches 24 staff for passenger and 30 staff for loading to Ashkona Hajj Camp in about one month.
- Biman Airlines dispatches 6 to 8 staff to Jeddah prior to the pilgrimage and 50 staff after the pilgrimage.
- Shortage of staff in HSIA during the pilgrimage
- Aircraft comes back from Jeddah with holy water (zamzam water)

(2) Priority Passengers Handling (Wheelchair etc.)

(Departure)

- Wheelchairs are stored between Row C and Row D for use.
- Upon request from the passenger at the check-in counter, the service staff will assist and guide the passengers with a wheelchair to the cabin.
- As many Bangladeshi nationals travel abroad to receive medical service, there is frequent use of the wheelchair services.

(Arrival)

- Wheelchairs are prepared at PBB according to the information from the departure airport.

2.5 Cargo Terminal Building

2.5.1 Cargo Warehouse Facility

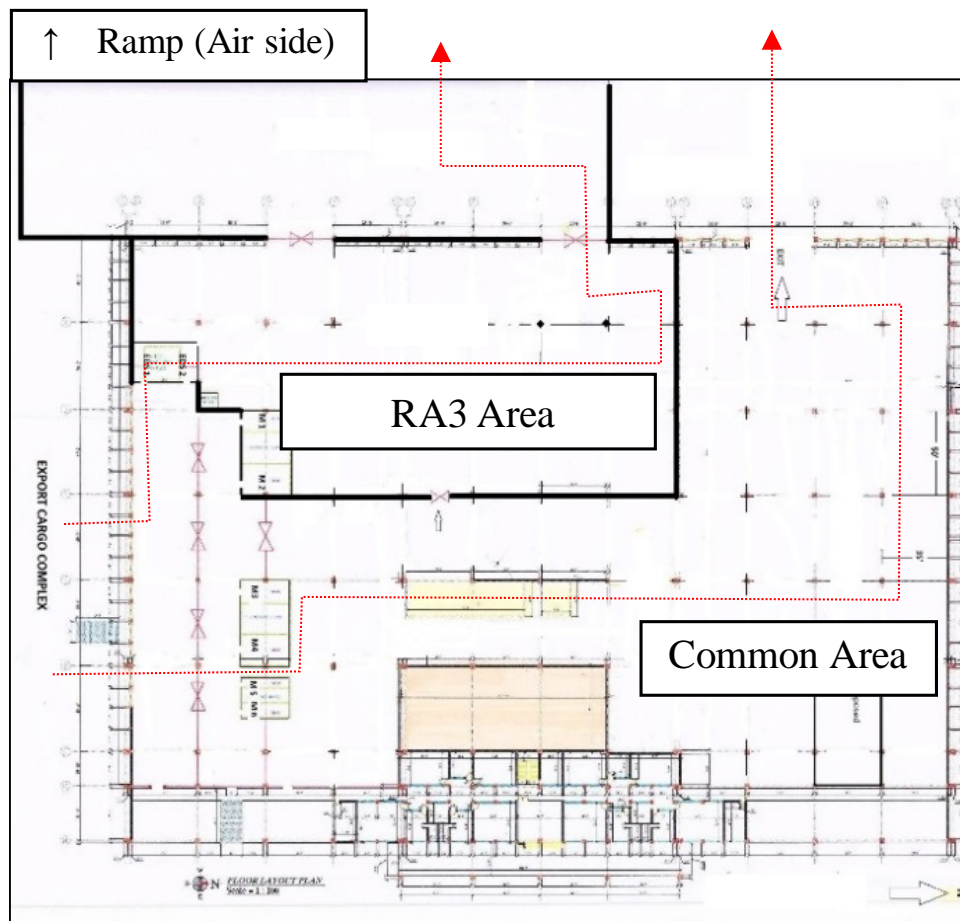
(1) Warehouse

The cargo terminal building in HSIA is divided into import and export cargo warehouse. Both of them are one-floor buildings. The total floor area of each building is shown in Table 2.5-1. The layout of the cargo terminals are shown in Figure 2.5-1, also, the plan of each section are shown in and Figure 2.5-2.

Table 2.5-1 Area Distribution of Cargo Terminal in HSIA

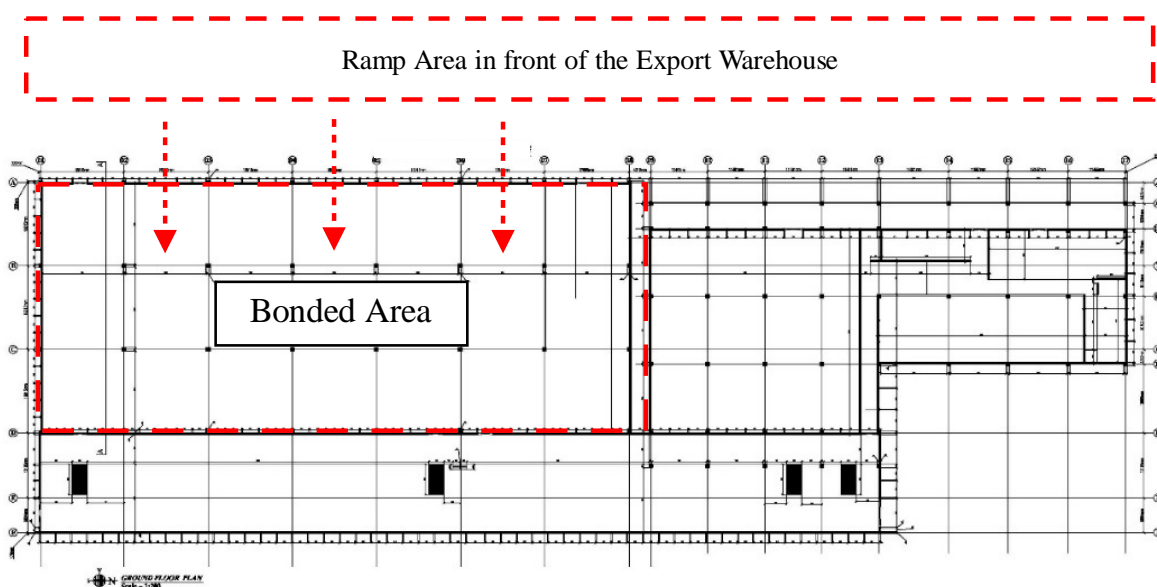
Facility	Floor Area
Export Warehouse	12,800 m ²
Import Warehouse	15,000 m ²

Source: CAAB



Source: JICA Study Team

Figure 2.5-1 Export Warehouse



Source: JICA Study Team

Figure 2.5-2 Import Warehouse

(2) GSE in the Warehouse

While there are as much as 8 heavy weight forklifts over 8 tons, there are only 2 light weight forklifts usually used in the warehouse. Narrow aisle stacker is used for cargo on high racks, however half of them are unserviceable. The rate of total unserviceable GSEs in the warehouse is more than 30%..

Table 2.5-2 List of GSE in the Warehouse

Self-propelled GSEs in Bonded Warehouse		Total Number	Available for use	Not-available for use	Note
Container Pallet Loader		20	12	8	Use when necessary
Container Pallet Transporter		20	10	10	Use when necessary
Fork Lift	10 tons	3	3	0	All is used for cargo
	8 tons	5	4	1	
	5 tons	3	0	3	
	3 tons	2	2	0	
Narrow Aisle Stacker		10	5	5	All is used for cargo
Tow Tractor Baggage		40	31	9	8 are used for cargo
Total		103	67	36	

Source: Biman Airlines

- Warehouse handling is basically done by human power using hand trolley or hand cart and efficient work using light weight forklift is not seen.



Photo 2.5-1 Hand trolley (sandwich skid and carry cargo)



Photo 2.5-2 Heavy weight forklift and hand cart (on the right)



Photo 2.5-3 Hard to turn forklift in narrow passage and fear to cause damage on cargo

- ➔ Half of 10 narrow aisle stackers are out of order. Cargo placed direct on the ground is an obstacle for stackers (Export Warehouse)



Photo 2.5-4 Cargo placed on the ground in between racks

- ➔ There are 30 twenty-foot pallet dollies and 150 ten-foot pallet dollies, however dollies available for cargo have a considerable shortage because they are used for transit cargo stored on the ramp, long stay builds up cargo and transportation of passenger baggage on it.



Photo 2.5-5 Transit cargo on dollies at the ramp side



Photo 2.5-6 Unloaded cargo from aircraft keeping on dollies



Photo 2.5-7 Built up pallet awaits long time for loading on aircraft

- There are 8 towing tractors for cargo out of 40 tractors. Under the present situation, it seems not necessary for more number of towing tractor for import handling because it cannot enter in the congestion of cargo in front of warehouse, however, shortage of towing tractor is worried in case flights are congested almost in the same time at the export warehouse.
- Usage of storage rack for export cargo is scarce because there are a few transit cargos in HSIA and usually cargo is carried out on the same day of carried in. Actually, racks in export warehouse is being used for storage of skids not of cargo.

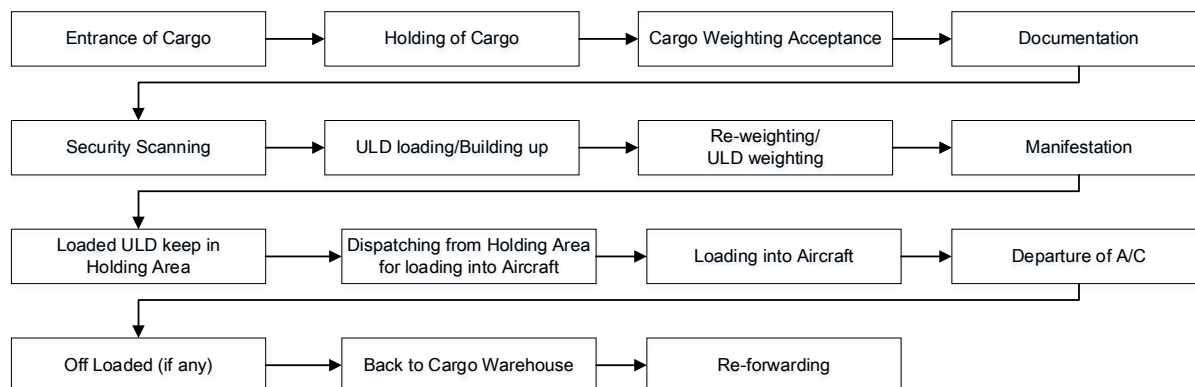


Photo 2.5-8 Export Racks not stored of Cargo

2.5.2 Export Cargo

(1) Flow of the Export Cargo Handling

Flow of export cargo handling is shown in Figure 2.5-3.



Source: JICA Study Team

Figure 2.5-3 Flow Chart of Export Cargo

(2) Scope of Responsibilities

The boundaries of responsibilities between “Cargo Terminal” and “Ramp” is under the canopy where usually acceptance of cargo is made. However, in HSIA, cargo unloaded from aircraft is carried to the outskirts of cargo wide spread in front of the warehouse due to the congestion there, where scope of responsibilities of acceptance is unclear.

Table 2.5-3 Scope of Responsibilities in Export Warehouse, and between Warehouse and Ramp

Venue	Event	Responsibility
Export Warehouse	Cargo In	Delivery In: Forwarder
	↓	
	Export Declaration	Cargo Handling: Biman Airlines (Cargo Terminal)
	↓	
Export Warehouse	Cargo Build-Up	Biman Airlines (Cargo Terminal) or BAFFA
	↓	
Ramp	Ramp Stored	Biman Airlines (Below Wing)
	↓	
	Aircraft Delivery	
	↓	
Ramp	Aircraft Loading	

Source: JICA Study Team

(3) Acceptance of Cargo

The cargo able to carry in to warehouse is only reserved one. Cargo booked for Biman, Ethihad and Saudia is carried to RA3 area and the rest of cargo for more than 30 airlines is carried to Common area. Trucks wait in a long queue to carry in and unload cargo to the warehouse because they cannot unload cargo until another stored unreserved cargo is moved out of there, is facing limit in capacity.



Photo 2.5-9 Long queue of trucks in front of export warehouse



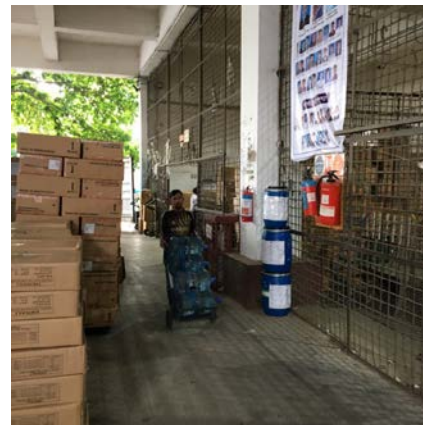
Photo 2.5-10 People carry in cargo on hand cart



Photo 2.5-11 Congestion in truck dock area



Photo 2.5-12 Space for acceptance of cargo



- (4) Delivery
Deliver cargo to scale
- (5) Weighing
Measure weight

(6) Document Check

Customs officer checks cargo and document for declaration and the Customs declaration is complete if it is passed. Biman staff checks document for carrying in to warehouse.

(7) Cargo Scanning

In RA3 area, EDS (Explosive Detection System) or EDD (Explosive Detection Dog) which meets western specifications are installed and check cargo one by one.



Photo 2.5-13 Cargo carry-in entrance in spacious RA3 area



Photo 2.5-14 Scanning by EDS in RA3 area

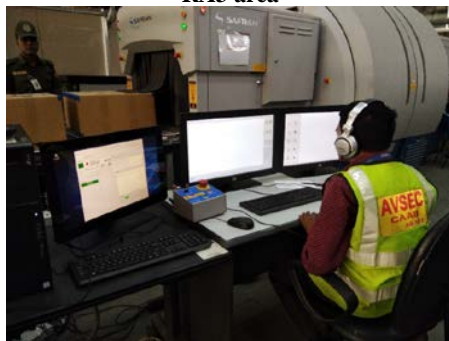


Photo 2.5-15 Scanning is done by AVSEC of CAAB

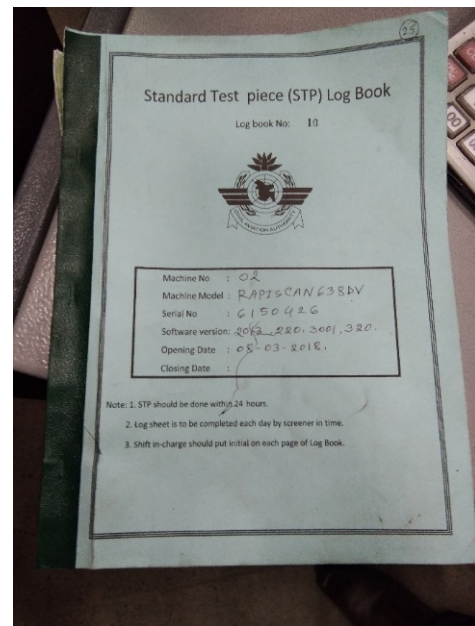


Photo 2.5-16 Scan Log Book



Photo 2.5-17 Scanned Stamp on Cargo

Cargo is scanned one by one by X-Ray machine in Common area



Photo 2.5-18 Piled cargo in front of X-ray



Photo 2.5-19 Storage space for unreserved Cargo



Photo 2.5-20 People has to push up steep slope

(8) ULD Build-Up

Build up is made by Biman Airlines in RA3 area and basically by BAFFA in Common area

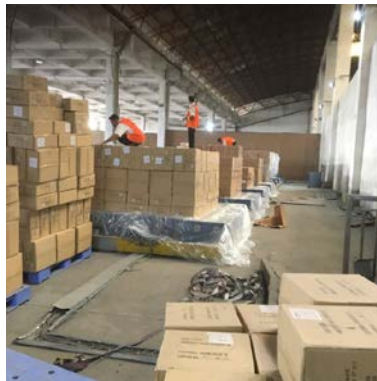


Photo 2.5-21 Cargo Build up in RA3 area

(9) Reweighing Built-up ULD

Reweight built up ULD

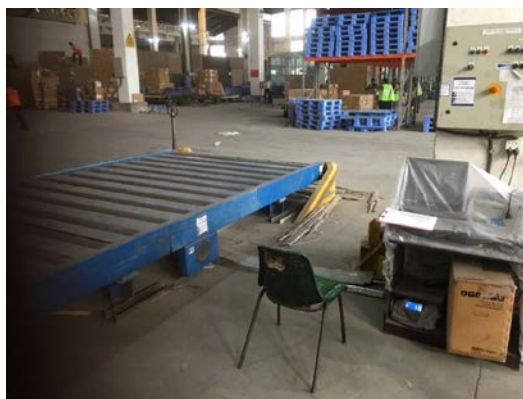


Photo 2.5-22 Weighing bed in RA3 area

(10) Manifesting

For passenger flight, common to all carriers, loading instruction based on ULD weight submit to Biman airlines 1 hour 45 minutes prior to departure. Biman airlines notifies weight and balance (W/B) sheet to loading supervisor.

For cargo freighter, based on ULD weight, its own Load Master notifies W/B sheet to loading supervisor 3 and half hours prior to departure for upper deck and 2 hours prior for lower deck.

Manifesting information such as AWB number, pieces, weight and commodity, etc. and ULD information sorted by ULD notifies to destination station through “SPOT” system for airlines using it. Airlines further register those information using password to “ASYCUDA” system of the Customs.

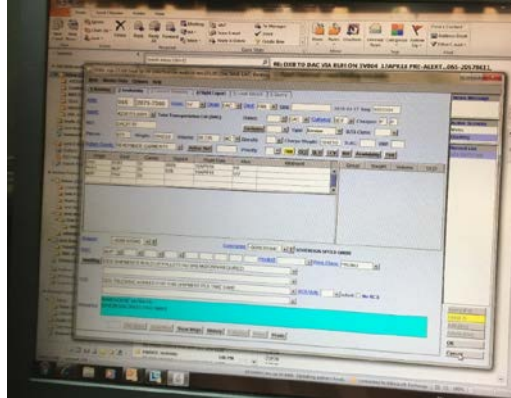


Photo 2.5-23 Display of “SPOT” system

1) Keep Built-up ULDs

Built up ULDs on dollies outside of warehouse await loading to the aircraft.



Photo 2.5-24 Built-up ULDs



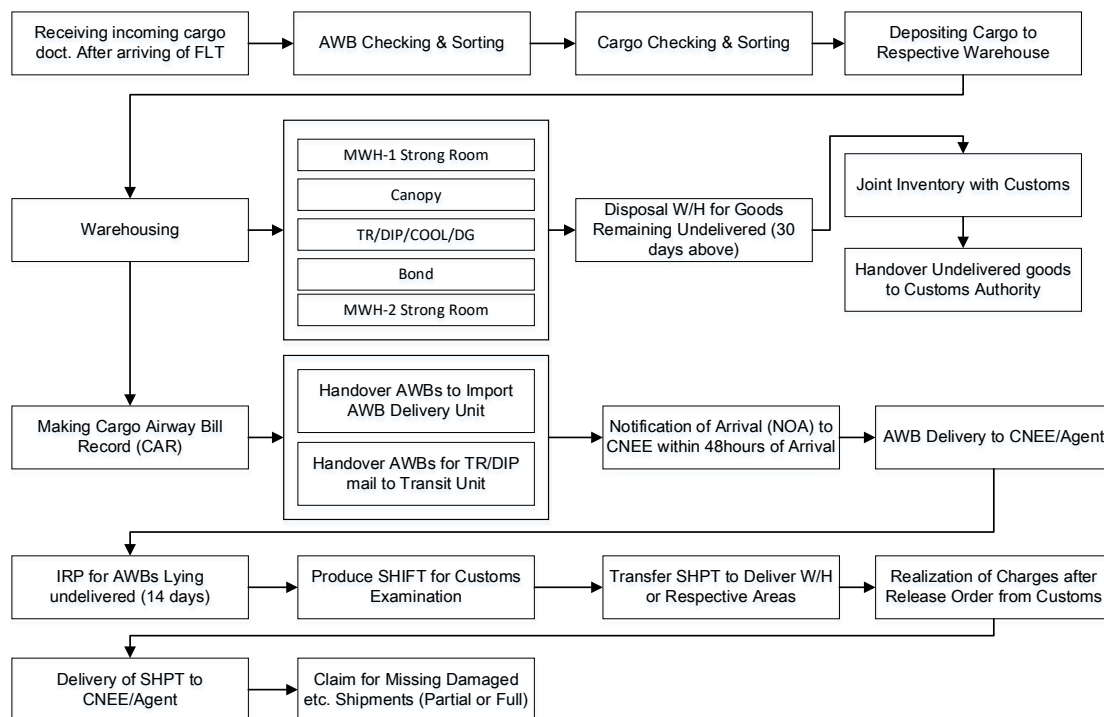
Photo 2.5-25 Some loose built up

2) Delivery and Loading of ULDs

Built Up ULDs and bulk cargo are delivered to aircraft for loading

2.5.3 Import Cargo

Flow of the import cargo handling is shown in Figure 2.5-4.



Source: Biman Airlines

Figure 2.5-4 Flow of Import Cargo

Generally, the responsibility demarcation between cargo terminal and ramp are divided from canopy of the warehouse where receiving of cargo is conducted. However it is different for HSIA since cargos are out of ramp area due to the lack of cargo terminal capacity. Therefore, the responsibility is not clear since receiving confirmation wont be conducted when the ULD is reloaded from the aircraft, it will be sent to the ramp area instead of the cargo warehouse.

Table 2.5-4 Scope of Responsibilities in Import Warehouse, and between Warehouse and Ramp

Venue	Event	Responsibility
Ramp	Spot-In	Biman Airlines (Below Wing)
	↓	
	Unload Cargo	Vague
Import Warehouse	Warehouse In	Biman Airlines (Cargo Terminal)
	↓	Customs Handling: CNF Agent
	Customs Declaration	
	↓	Cargo Handling: Biman Airlines (Cargo Terminal)
	Customs Clearance	
↓		
Cargo Out		

Source: JICA Study Team

(1) Acceptance of Cargo Document from Flight (F.T: Freight Traffic)

The office where AWB, manifest etc. are delivered in pouch.



Photo 2.5-26 F.T (Freight Traffic office)

(2) Audit AWB (F.T section)

Audit all AWBs arrived

(3) Cargo Check and Segregate Location to Store (F.T Section)

Check piece and appearance of cargo corresponding to manifest. Segregate location to store if there was no irregularity.

(4) Storing of Cargo (F.T Section)

Location: MWH-1,2 (strong room), Canopy, TR/DIP/COOL/DG, BOND Storage Area: MWH-1,2 (strong room), Under the eave, TR/DIP/COOL/DG, BOND

Cargo undelivered for more than 30 days lay on the shelf after having Customs officer's verification.

(5) Register AWB number (F.T Section)

Deliver TR and DIP mail to transit section and other cargo to import section after registration of AWB.

(6) Arrival Notice (Import Service Section)

Notification of arrival is made to customer or its agent within 48 hours after arrival. (Within 48 hours is normal compared to global standard)

(7) Hand over AWB to Customer (Import Service Section)

Hand over AWB to customer or its CNF agent (CNF agent is local name for Customs Broker)

(8) Issuance of IRP (F.T Section)

IRP (Irregularity Report) is issued for cargo undelivered for more than 2 weeks

(9) Customs Inspection for IRP Cargo (WH: Warehouse Operation Section)

Customs inspection is made for cargo issued IRP and store it to designated location

(10) Charge Collection (IMP Section)

Collect charges for cargo Customs cleared

(11) Delivery to Customer or Its Agent (D/G Customer Service Section)

Cargo is handed over to consignee or its agent

(12) Claim (Claim section)

Department corresponds to claim if any

2.5.4 Present Situation of Warehouse

(1) Export Warehouse

Export warehouse is divided into two part, one is called “RA3” area and another is called “Common” area. In RA3 area, EDS (Explosive Detection System) or EDD (Explosive Detection Dog/Dock) of western high standard advanced security system are installed and qualified staff work there.

In order to be allowed to handle in RA3 area, airlines have to acquire qualification of ACC3 (Air Carrier Certificate for 3rd country) which only Biman, Ethihad and Saudia are qualified. (Pending for Qatar and Emirates)

2 Rapiscan 638DV are installed in RA3 area. Cargo destined for EU is not necessary to unload and check again at stopover country. Basically 8 positions are used for building up ULD and other 2/3 positions are used building up on the ground.

In RA3 area, cargo staff put double vinyl sheets on cargo which complies to global standard and makes contoured build up which seems being trained, however stamp on cargo and pop up cargo from ground to build high pallet cannot say to have enough training of safety and quality handling. The number of staff working there was small and simultaneous parallel processing on building up ULDs was not observed.

In export warehouse, security check is strictly done in the following order (Photo 2.5-30):

- (1) Enter from outside to warehouse
- (2) Enter cargo clean area (Common area and then RA3 area)
- (3) Enter ramp area from cargo clean area



Photo 2.5-27 B/U in RA3 area



Photo 2.5-28 Contoured B/U



Photo 2.5-29 B/U on high pallet



Photo 2.5-30 Security check at the entrance of export warehouse

In common area, cargo of over 30 airlines is handled in narrow space. Depend on season and hours, however usually very congested and it is hard to secure space for building up ULD. There are 5 X-Ray scanning machines, however they tend to not work, so scanning area is congested. BAFFA (Bangladesh Forwarders Association) staff as an agent of forwarder were observed working there.



Photo 2.5-31 BAFFA staff office

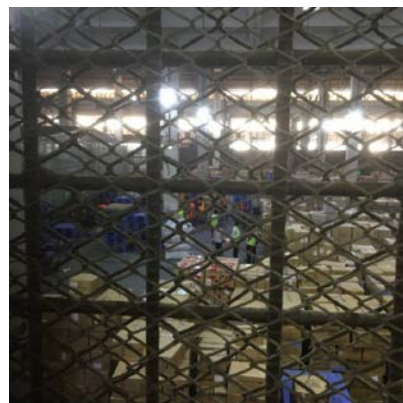


Photo 2.5-32 Hand trolley threads through cargo



Photo 2.5-33 Congestion in front of X-Ray Scanning Machine

(2) Import Warehouse

1) Inside of Warehouse

Import warehouse is divided into 2 part, Warehouse1 and warehouse2. Basically, Customs officer, CNF agent (Customs Broker) and Biman staff are only allowed to enter the premises. There are 4 shelf racks, refrigerator, and store room for valuables (strong room), pharmaceuticals and dangerous goods. Way out gates are Gate1-3 for dutiable and non-dutiable separately and Gate 8 open 24 hours to deliver perishables, birds and large animal like giraffe, valuables and weapons, etc.



Photo 2.5-34 4 Shelf Racks



Appearance
Refrigerator (2°C ~8°C) is small, so perishable shipment can be delivered through Gate 8 if advance declaration is approved

Full of Shipment Inside

Photo 2.5-35 Refrigerator



Thick and rough wired
Photo 2.5-36 Strong Room



DG Room



DG in front of DG Room



DG on BrokenSkid

Photo 2.5-37 DG (Dangerous Goods) Room

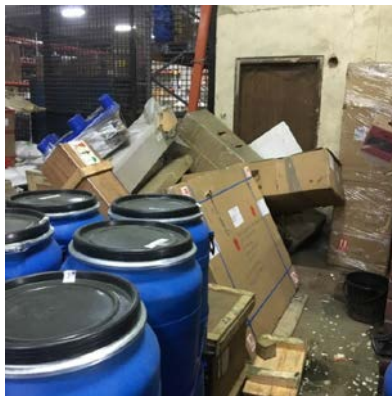


Photo 2.5-38 In Front Side of Pharmaceuticals Storing Room



Photo 2.5-39 GATE 8



Warehouse Side



Way Out

Photo 2.5-40 Customs Inspection is Made Again at The Exit of Cargo GATE 3



Photo 2.5-41 Entrance and Exit of People (Customs, Biman Airlines Staff and Security are Station)

2) Under the Canopy

Cargo handling is basically done by human power and hand trolleys are threading through chaos cargo where severe congestion in chaos situation is observed.



Photo 2.5-42 Situation under Canopy (Disorder)



Photo 2.5-43 Cargo on its back



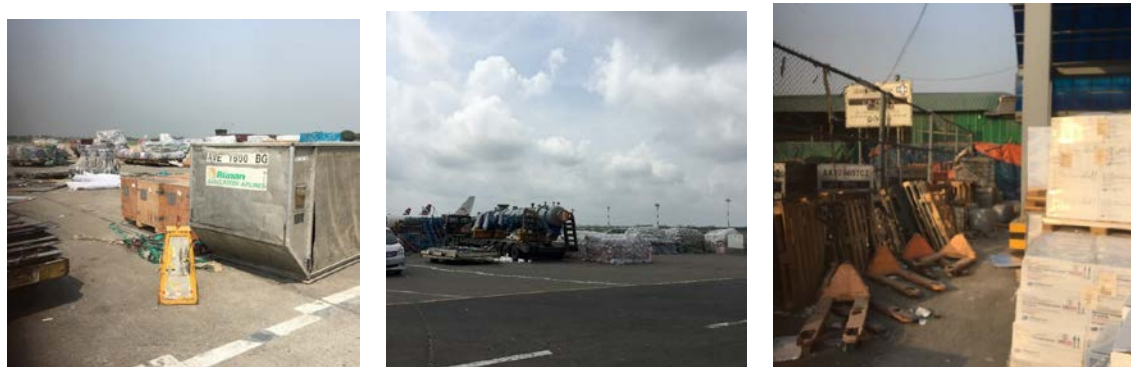
Photo 2.5-44 CNF agent (Customs Broker) staff push their cargo

3) Situation in front of Import Warehouse

Cargo overflows from warehouse to ramp side, therefore cargo unloaded from aircraft is placed away from warehouse near the circuit road at ramp side. Biman staff unload cargo from ULD and break down cargo by human power. As there is no designated location to store skid and pallet, those things are scattered around near the ramp area with breaking down ULDs, box cart and a lot of cargo some on dollies and some direct on the ground. The situation causes wet and injured damage and loss of cargo. There is also a problem for safety operation of aircraft because some of the cargo overflowed to ramp area beyond circuit road.



Scattered Cargo, ULD and Skid in front of warehouse



Cargo overflows to ramp

Skids and Trolleys placed along the Fence

Photo 2.5-45 Situation of Ramp Side in Front of Warehouse

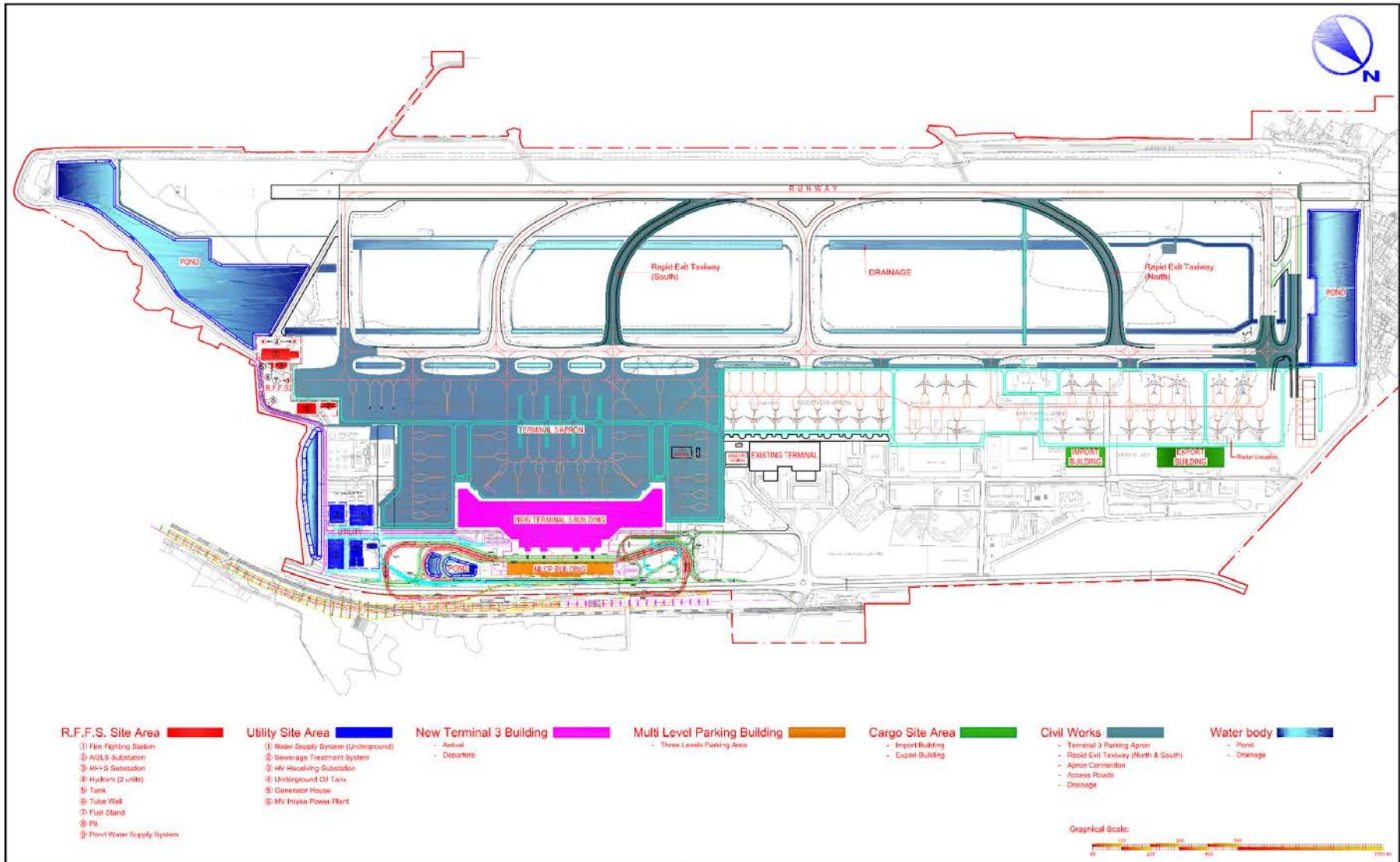
2.6 Terminal Layout

To meet the increasing demand of air transportation, the new passenger terminal (T3) and cargo terminal should be completed in 2023 through “HSIA Expansion Project.” The new passenger terminal is plan to be 3 floor and the total floor area would be 3 times more of the total floor area of passenger terminal 1 and 2. On the other hand, the total floor area of the new cargo terminal would be 2 or 3 times more than the current one to meet the future demand.

Table 2.6-1 Floor Area Table of Passenger and Cargo Terminal After the Expansion

Facility	Floor Area
International Passenger Terminal Building 3 (T3)	About 30,000 m ²
Export Cargo Terminal	About 36,000 m ²
Import Cargo Terminal	v27,000 m ²

Source: JICA Study Team



Source: JICA Study Team

Figure 2.6-1 Layout of HSIA after the Expansion

Chapter 3 Result of the Field Survey

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CHAPTER 3 RESULT OF THE FIELD SURVEY

3.1 Summary of the Survey Result

The summary of the survey result regarding passenger service, ramp service, air cargo handling (import/export), customs, and immigration are shown in Table 3.1-1.

Table 3.1-1 Summary of the Survey Result

No.	Survey		Weekday/end	Content, Sample		Result (Average)	
1	Passenger Service	Check-in Waiting and Processing Time	Weekday	Waiting Time:	11 flights, 120 samples	20.2 min	
				Processing Time:	11 flights, 120 samples	3.2 min	
			Weekend	Waiting Time:	15 flights, 108 samples	24.1 min	
				Processing Time:	15 flights, 108 samples	3.3 min	
2	Passenger Service	Baggage Inspection and Boarding Pass Confirmation	Weekday	Waiting Time:	9 flights, 143 samples	10.7 min	
				Inspection Time:	9 flights, 143 samples	2.8 min	
			Weekend	Waiting Time:	8 flights, 9 samples	9.8 min	
				Inspection Time:	8 flights, 109 samples	2.2 min	
3	Ramp Service	Passenger Arrival Time	Weekday	Processing Time: PBB Spot	9 flights	4 min	
				Remote Spot	1 flight	12 min	
			Weekend	Processing Time: PBB Spot	9 flights	4 min	
				Remote Spot	5 flights	13 min	
4	Ramp Service	Baggage Returning Time	Weekday	Time until the first baggage is brought to the BHS: 17 flights		27 min	
				Total time until all the baggage were returned: 17 flights		28 min	
			Weekend	Time until the first baggage is brought to the BHS: 16 flights		24 min	
				Total time until all the baggage were returned: 16 flights		37 min	
5	Air Cargo Handling (Import)	Cargo Conceiving Time from Aircraft Arrival to the Warehouse	Weekday	Processing Time: 21 flights		1hour 37 min	
			Weekend	Processing Time: 10 flights			
6	Air Cargo Handling (Import)	Processing Time from Entering the Warehouse to Customs Registration	Weekend	Processing Time: 250 samples		3.4 day	
7		Processing Time from Customs Registration to Customs Clearance	Weekday	Processing Time: 800 samples		2.4 day	
			Weekend	Processing Time: 400 samples			
8		Processing Time from Customs Clearance to Exit the Warehouse	Weekday	Processing Time: 800 samples		40 min	
9	Weekend		Processing Time: 400 samples				
10	Air Cargo Handling (Export)	Cargo Conceiving Time from Track Arrival to the Warehouse	Weekday	Processing Time: 4 samples		6 hour 38 min	
			Weekend	Processing Time: 5 samples			
11	Air Cargo Handling (Export)	Waiting Time from entering the Warehouse to Start Building-Up	Weekday	Processing Time: 10 samples		5 hour 53 min	
			Weekend	Processing Time: 110 samples			
12	Air Cargo Handling (Export)	Processing Time of Building-Up	Weekday	Processing Time: 210 samples		3 hour 8 min	
			Weekend	Processing Time: 110 samples			
13	Air Cargo Handling (Export)	Cargo Conceiving Time from Warehouse to the Aircraft	Weekday	Processing Time: 11 flights		10 hour 58 min	
			Weekend	Processing Time: 10 flights			
14	Immigration and Customs	Processing and Waiting Time of Departure and Arrival Immigration	Weekday	【Departure】	Waiting and Processing Time: 222 samples	5.8 min	
					Processing Time: 44 samples	2.0 min	
				【Arrival】	Waiting and Processing Time: 450 samples	6.3 min	
			Processing Time: 103 samples		3.5 min		
			Weekend	【Departure】	Waiting and Processing Time: 121 samples	8.3 min	
					Processing Time: 121 samples	2.5 min	
【Arrival】	Waiting and Processing Time: 141 samples	7.7 min					
	Processing Time: 141 samples	2.8 min					
15	Immigration and Customs	Processing Time of Passenger Export/Import Customs Clearance	Weekday	【Export】	Not conducted at HSIA		N/A
				【Import】	Processing Time: 146 samples	2.5 min	
			Weekend	【Export】	Not conducted at HSIA		N/A
				【Import】	Processing Time: 132 samples	2.1 min	

Source: JICA Study Team

3.2 Passenger Service

3.2.1 Site Survey Method

(1) Check-in Time (waiting time and processing time for passenger check-in)

The JICA Study Team measured the required time (i.e., waiting time and processing time combined) for check-in of international departure passengers and calculated the average time and distribution based on the number of sample cases. Approximately, ten flights per day for a total of two days (one weekday and one weekend) were surveyed. Site survey on actual handling (a)–1 for required time for check-in is shown in Table 3.2-1.

Table 3.2-1 Site Survey Method on Actual Handling (a)–1 (Required Time for Check-in)

Aspect		Survey Item
How to Record	Location	International passenger check-in desk
	Survey items	Check-in time (waiting time and processing time combined)
	Survey period, time	Ten flights per day (one hour per flight) One day on a weekday and another day on weekend
	Start of time count	1. Choose the longest queue for check-in for the designated flight 1-1. Time count starts when the first passenger leaves the queue for check-in. 1-2. Mark the last passenger of the queue as targeted passenger for timing. Time count starts when the passenger hands out the passport to the officer.
	End of time count	2. Record the time when the last passenger marked in 1.2 above comes to the check-in desk and hands the passport to the officer. 2-1. Record the process time when the passenger receives the passport and leaves the check-in desk.
Surveyor: Equipment	Surveyor 3: a) Where the check-in procedure is seen b) Where the queue for check-in is seen c) Where the queue for check-in (including the exchange the battery for video camera) is seen Video camera 2: At the same place with the surveyor (on the step ladder) Surveyors record the data based on their observations.	
Image	<p>Identify the longest queue (of the selected check-in class / method)</p> <p>Wait until a passenger (U) of this queue leaves the queue to go to the counter</p> <p>Identify the last passenger (U) of the longest queue</p> <p>Set the time of identification</p> <p>Fieldwork Agent</p>	

Source: JICA Study Team

(2) Hand-carry Baggage Check, Passenger Screen, and Passport/Boarding Pass

The Japan International Cooperation Agency (JICA) Study Team measured the time (i.e., waiting time and processing time combined for a passenger) required for checking of hand-carry baggage and for screening of passengers, passport, and boarding pass at the security check at the international departure gate, and then calculated the average time and distribution based on the number of sample cases. Approximately ten flights per day for a total of two days (one weekday and one weekend) were surveyed. The site survey method of hand-carry baggage check and screening of passengers, passport, and boarding pass is shown in Table 3.2-2.

Table 3.2-2 Site Survey Method of Hand-Carry Baggage Check, Screening of Passengers, Passport and Boarding Pass

Aspect		Survey Item
Location		International Departure Boarding Gate
Survey Items		Hand-carry baggage check and screening of passenger, passport, and boarding pass. Measure time from boarding announcement or prescribed boarding time printed on the boarding pass to completion of boarding with all the passengers checked-in, then calculate the time required per passenger (passenger waiting time and processing time to be confirmed).
Survey Period, Time		Approximately 10 flights per day One weekday and one weekend, two days in total
Waiting Time	Start of time count	1. Time count starts when passengers start forming the queue for boarding 1-1. Hand out sheet of paper to several passengers in the queue for marking
	End of time count	1-2. When the first passenger hands out the passport to the officer after announcement for boarding 1-3. Record the time when the passenger has completed the security check
Process Time	Start of time count	2. When the passenger starts the hand-carry baggage check 2-1. When the preceding check is completed
	End of time count	2-2. (Process time for one passenger) Record the process time when the passenger takes the hand-carry baggage and leaves the roller table 2-3. Record the time when the passenger has completed the security check
Surveyor: Equipment		Surveyor 3: a)Hands out the paper with a time written to the passenger b)Next to the passport check officer c)Where hand-carry security check is completed
Image		

Source: JICA Study Team

3.2.2 Survey Result (Passenger Service)

Check-in processing time is determined by factors such as: 1) if passenger has an onward connection or not, 2) if he or she has checked baggage or not (and number of baggage to be checked-in), and 3) length of the required documentation check. Since most passengers at the Hazrat Shahjalal International Airport (HSIA) have baggage to be checked in, the processing time tends to become somewhat longer.

Regarding gate security, processing time does not vary regardless of the destination of flight because security procedures are standardized, except for flights to London Heathrow Airport (LHR). The waiting time gets longer for wide-body aircrafts due to the limited number of gates for the security check.

It appears that the following factors prevent the smooth handling of flights:

- 1) Inability to open check-in counters as scheduled by airlines due to the delay in securing the counters prior to start of check-in process; and,
- 2) Delay in gate allocation which postpones the gate security check as scheduled for flight departure.

Table 3.2-3 Survey Result Check-in Processing Time (Weekday)

Survey Date: 2018/6/28

2018/7/2

Flight No.	Destination	Departure Time	Starting Time	Finishing Time	Total Time	Number of Samples	Average Time (Waiting + Processing Time) (min)	Average Waiting Time (min)	Average Processing Time (min)	Remarks
EK583	Dubai	10:15	8:30	8:46	0:16	6	4.2	2.0	2.2	
UL190	Colombo	13:00	10:26	12:02	1:36	19	19.0	15.3	3.7	
TG322	Bangkok	13:35	10:53	12:27	1:34	14	45.3	41.9	3.4	
9W275	Kolkata	13:45	10:26	11:09	0:43	12	12.2	7.9	4.3	
BG027	Abu Dhabi	18:20	15:01	15:53	0:52	5	35.2	33.6	1.6	
BG086	Kuala Lumpur	19:15	15:11	16:08	0:57	9	26.8	23.8	3.0	
REGEN	(ALL Destination)	N/A	16:01	16:24	0:23	10	5.8	2.7	3.1	
EK587	Dubai	19:30	16:18	17:06	0:48	14	22.1	18.7	3.4	
SV805	Riyadh	22:45	20:17	21:08	0:51	11	26.6	23.2	3.4	
TR505	Singapore	22:45	20:55	21:19	0:24	8	11.9	9.1	2.8	
MH113	Kuala Lumpur	22:45	20:17	22:01	1:44	12	39.6	37.0	2.6	
Total						120				
Average							23.4	20.2	3.2	

Source: JICA Study Team

Table 3.2-4 Survey Result Check-in Processing Time (Weekend)

Survey Date: 2018/4/28

2018/6/30

Flight No.	Destination	Departure Time	Starting Time	Finishing Time	Total Time	Number of Samples	Average Time (Waiting + Processing Time) (min)	Average Waiting Time (min)	Average Processing Time (min)	Remarks
UL190	Colombo	13:30	10:25	11:27	1:02	6	24.2	21.0	3.2	
TG322	Bangkok	13:35	11:30	12:28	0:58	5	30.0	26.8	3.2	
BS321	Muscat	17:15	14:47	15:11	0:24	7	10.1	7.7	2.4	
BG043	Kuwait	19:00	17:40	19:04	1:24	8	53.6	48.6	5.0	Delay
BG095	Kolkata	19:20	18:10	19:07	0:57	10	28.5	24.8	3.7	
EK587	Dubai	19:30	16:05	16:42	0:37	11	12.4	10.2	2.2	
REGEN	(ALL Destination)	ALL	18:12	19:14	1:02	8	3.4	0.3	3.1	
MH197	Kuala Lumpur	20:05	19:14	20:11	0:57	5	33.6	29.2	4.4	
AI229	Kolkata	21:25	18:20	18:57	0:37	12	11.4	7.6	3.8	
EY253	Babu Dhabi	21:50	19:20	20:34	1:14	5	37.0	29.8	7.2	
BS307	Singapore	22:30	19:04	19:50	0:46	5	23.0	18.0	5.0	
G9 514	Sharjah	22:30	19:06	20:10	1:04	5	40.0	36.0	4.0	
SV805	Riyadh	22:45	18:59	20:29	1:30	10	59.8	57.8	2.0	
TR505	Singapore	22:45	19:52	20:40	0:48	3	34.3	30.7	3.6	
TG340	Bangkok	2:00	23:15	0:07	0:52	8	29.4	25.8	3.6	
Total						108				
Average							27.4	24.1	3.3	

Source: JICA Study Team

Table 3.2-5 Analysis of Check-in Process Time Survey Result

Result	<ul style="list-style-type: none"> ➔ Average check-in process time: Weekday: 3.2 minutes; Weekend: 3.3 minutes ➔ Average waiting time: Weekday: 20.2 minutes; Weekend: 24.1 minutes ➔ Average process time (wait + process): Weekday: 23.4 minutes; Weekend: 27.4 minutes ➔ There is no difference between weekdays and weekends. ➔ Regent Airways recorded a short waiting time as the survey was not taken during the peak time.
Analysis	<ul style="list-style-type: none"> ➔ Unlike other airlines, Regent Airways conducts check-in without assigning the counter for the particular flight (any counter can be used for check-in of any flight). This is possible as they have fixed check-in counters. ➔ Although check-in counters for airlines other than Biman Airlines are generally crowded, airline staff attend to passengers for check-in in an orderly manner. ➔ BG043/KWI was longer than other flights. ➔ For reference, Japanese standards require that check-in process time be 1 to 2 minutes and that wait time for check-in (economy) be 15 minutes. In total, the average check-in time (process + wait) is around 17 minutes. ➔ Survey results show that the average check-in time on weekdays is 23.4 minutes and on weekends is 27.4 minutes. Thus, it is 1.4~1.6 times longer compared with the Japanese standard. ➔ In addition, based on IATA's Level of Service (LoS) Guidelines, the standard check-in (economy) time (process + wait) is 10~20 minutes, which means the survey results are over the standard.

Source: JICA Study Team

Table 3.2-6 Survey Result of Security Gate Processing Time (Weekday)

Survey Date: 2018/4/25

Flight No.	Destination	Departure Time	Starting Time	Finishing Time	Total Time	Survey Starting Time Before STD (h:mm)	Sample Number	Average Time (Waiting + Processing Time) (min)	Average Waiting Time (min)	Average Processing Time (min)	Remarks
BG001	London	10:00	8:30	10:15	1:45	Before 1:30	28	30.1	23.5	6.6	
TG322	Bangkok	13:35	12:08	12:52	0:44	Before 1:27	13	3.3	2.1	1.2	
QR635	Doha	19:40	18:22	19:22	1:00	Before 1:18	22	15.6	11.9	3.7	
BS333	Doha	18:00	16:50	17:26	0:36	Before 1:10	18	18.6	16.5	2.1	
EK587	Dubai	19:30	18:21	19:07	0:46	Before 1:09	26	6.2	4.6	1.6	
KU286	Kuwait	11:35	10:34	11:19	0:45	Before 1:01	12	4.8	3.8	1.0	
BS321	Muscat	17:15	16:18	16:39	0:21	Before 0:57	9	3.2	1.5	1.7	
BG084	Singapore	8:25	7:33	8:18	0:45	Before 0:52	10	10.1	8.8	1.3	
SV807	Riyadh	15:55	16:23	16:49	0:26	N/A	5	4.6	3.6	1.0	Delay
Total							143				
Average								13.5	10.7	2.8	

Source: JICA Study Team

Table 3.2-7 Survey Result of Security Gate Processing Time (Weekend)

Survey Date: 2018/6/30

Flight No.	Destination	Departure Time	Starting Time	Finishing Time	Total Time	Survey Starting Time Before STD (h:mm)	Sample Number	Average Time (Waiting + Processing Time) (min)	Average Waiting Time (min)	Average Processing Time (min)	Remarks
KU286	Kuwait	11:35	10:15	11:10	0:55	Before 1:20	16	14.3	11.2	3.1	
BG088	Bangkok	11:05	10:37	10:53	0:16	Before 0:28	9	5.0	3.2	1.8	
BG039	Riyadh	13:30	12:00	12:47	0:47	Before 1:30	12	10.8	8.7	2.1	
TG322	Bangkok	13:35	12:32	13:23	0:51	Before 1:03	16	10.4	8.6	1.8	
BG127	Abu Dhabi	16:35	17:04	18:08	1:04	N/A	13	3.5	1.7	1.8	Delay
BS321	Muscat	17:15	16:08	16:31	0:23	Before 1:07	8	12.4	10.9	1.5	
EK587	Dubai	19:30	17:49	18:56	1:07	Before 1:41	29	19.0	16.6	2.4	
RX791	Kolkata	10:30	9:48	10:06	0:18	Before 0:42	6	7.2	4.0	3.2	
Total							109				
Average								12.0	9.8	2.2	

Source: JICA Study Team

Table 3.2-8 Analysis of the Survey Result of Site Survey Method of Hand-Carry Baggage Check, Screening of Passengers, Passport and Boarding Pass

Result	<ul style="list-style-type: none"> → Average process time (wait + process) on weekdays is 13.5 minutes and on weekends is 12.0 minutes. → Average process time on weekdays is 2.8 minutes and on weekends is 2.2 minutes. → Regarding passport/boarding pass screening, the process is carried out before baggage and passenger inspection, and the required time is included in the waiting time. Confirmation work is carried out by checking the boarding pass (flight number, name, etc.) and the boarding ticket, checking the passport photo with the principal passenger, and checking the name. The required time is about 30 seconds. → There is no difference between weekdays and weekends. → BG001/25APR (LHR) was longer than other flights due to the following factors: i) transit passengers from Sylhet came to the gate, ii) high security level is in effect in LHR, and iii) most passengers are unfamiliar with the procedure.
Analysis	<ul style="list-style-type: none"> → Since the assignment of the departure flight gate is delayed, the inspection start time is also delayed. → It is important to assign gates earlier. → Some airlines classify the queue by travel class (i.e., business class and economy). → For reference, the standard time for the security control process is 5 to 10 minutes according to IATA's LoS Guidelines. The average survey time on weekdays is 13.5 minutes and on weekends is 12 minutes. Those values are over the Japanese standard time.

Source: JICA Study Team

3.3 Ramp Services

3.3.1 Site Survey Method

(1) Ramp Handling Time of Arriving International Passengers from Aircraft to Terminal Building

The JICA Study Team measured the time required for ramp handling services with respect to international passenger flights, more specifically the time from the arrival of the aircraft at the gate to the deplaning of passengers. Then, the JICA Study Team calculated the average time and distribution based on the number of sample cases. Approximately ten flights, which use passenger boarding bridges (PBB) or airside transfer buses, per day for a total of two days (one weekday and one weekend) were surveyed. The site survey method of ground handling time for arriving international passengers is shown in Table 3.3-1.

Table 3.3-1 Ramp Handling Time of Arriving International Passengers from Aircraft to Terminal Building

Aspect		Survey Item
Location		Flight using PBB: At the entrance to PBB Flight using airside transfer bus: At the airside bus boarding gate (arrival)
Survey Items		Measure time from flight on-block to arrival of the first passenger at the passenger terminal. Measure total process time from flight on-block to arrival of last passenger at the passenger terminal.
Survey Period and Time		Approximately ten flights per day Two days in total (one weekday and one weekend) Make sure that the time of the flight to be surveyed is spread out and the destination is spread out per flight schedule.
How to Record	Start of time count	Obtain actual on-block time from operating carrier
	End of time count	Flight using PBB: First and last passenger goes into the terminal through PBB Flight using airside transfer bus: First and last passenger goes into the terminal from the bus gate
Surveyor: Equipment		Surveyor x1: At boarding gate or airside transfer bus boarding gate

Source: JICA Study Team

(2) Baggage Reclaim for International Arrival Flights

The JICA Study Team measured the time required for baggage reclaim from the arrival of the aircraft to the arrival of the first checked luggage on the baggage turntable, and then calculated the average time and its distribution. Approximately ten flights per day for a total of two days (one weekday and one weekend) were surveyed. The site survey method of baggage reclaim for international arrival flights is shown in Table 3.3-2.

Table 3.3-2 Baggage Reclaim for International Arrival Flights

Location		International Baggage Sorting Area (Arrival)
Survey Items		Measure time from arrival of aircraft to arrival of the first baggage on the turntable, and calculate average time and its distribution.
Survey Period and Time		Approximately ten flights per day Two days in total (one weekday and one weekend)
How to Record	Start of time count	Obtain actual on-block time from operating carrier.
	End of time count	First baggage: Record the time when the first checked baggage is placed on the sorting belt for baggage claim. Last baggage: Record the time when the last checked baggage is placed on the sorting belt for baggage claim.
Surveyor: Equipment		Surveyor x1: Arrival baggage sorting area

Source: JICA Study Team

3.3.2 Summary of Survey Result

(1) Handling Time of Arriving International Passengers from Aircraft to Terminal Building

It appears that the standard level for the handling of aircraft arrival works at the gate is achieved. This is because upon on-block, it takes an average of 4 minutes for passengers to reach the terminal building for flights using a PBB. Works to be performed upon on-block of the aircraft include the attachment of a boarding bridge to the aircraft, the door opening operation, and the ship meet by airline staff. The process may be shortened by improving staff's skill in attaching the boarding bridge. The passenger deplaning process seems to be relatively smooth considering only a one-door bridge is in operation.

Regarding gate allocation issues (i.e., PBB spots vs remote stands), while the PBB spots allocation ratio for Bangladeshi airlines is 21.43% and for foreign airlines is 82.99%, the ratio for the total flight is 63.13%. Although Bangladeshi airlines tends to be allocated remote stands more frequently, remote stand handlings are performed without major delay by using their own airside transfer buses for boarding and deplaning.

Table 3.3-3 Survey Result of Terminal Arrival Time (Weekday)

Survey Date: 2018/4/25

Flight No.	Destination	Type of Aircraft	Scheduled Arrival Time	Aircraft Arrival Time	Terminal Arrival Time (First Passenger)	Terminal Arrival Time (Last Passenger)	All Passenger Getting-Off Time	Aircraft Arrival Time to Terminal Arrival Time (First Passenger)	Time from landing to terminal Arrival (First)	Landing Time	Remarks
RX783	Kuala Lumpur	737	8:20	7:56	8:08	8:13	0:05	0:12	0:21	7:47	REMOTE
G9517	Sharjah	320	9:00	8:28	8:31	8:34	0:03	0:03	0:09	8:22	PBB
EK582	Dubai	777	8:40	8:32	8:37	8:48	0:11	0:05	0:11	8:26	PBB
GF248	Bahrain	330	8:55	8:57	9:01	9:06	0:05	0:04	0:13	8:48	PBB
KU285	Kuwait	777	10:05	9:58	10:05	10:13	0:08	0:07	0:16	9:49	PBB
SQ448	Singapore	330	11:35	11:29	11:32	11:39	0:07	0:03	0:09	11:23	PBB
9W276	Mumbai	737	11:45	11:33	11:41	11:51	0:10	0:08	0:17	11:24	PBB
UL189	Colombo	330	12:00	11:52	11:54	12:01	0:07	0:02	0:09	11:45	PBB
TG321	Bangkok	777	12:10	12:52	12:54	13:01	0:07	0:02	0:10	12:44	PBB
EK586	Dubai	777	17:20	16:51	16:55	17:06	0:11	0:04	0:11	16:44	PBB

Average Time (min) Remote	0:05	0:12	0:21
Average Time (min) PBB	0:07	0:04	0:11

Source: JICA Study Team

Table 3.3-4 Survey Result of Terminal Arrival Time (Weekend)

Survey Time: 2018/6/30

Flight No.	Destination	Type of Aircraft	Scheduled Arrival Time	Aircraft Arrival Time	Terminal Arrival Time (First Passenger)	Terminal Arrival Time (Last Passenger)	All Passenger Getting-Off Time	Aircraft Arrival Time to Terminal Arrival Time (First Passenger)	Time from landing to terminal Arrival (First)	Landing Time	Remarks
BS334	Doha	737	9:20	9:57	10:08	10:11	0:03	0:11	0:19	9:49	REMOTE
RX756	Riyadh	737	9:10	10:03	10:12	10:14	0:02	0:09	0:18	9:54	REMOTE
BG072	Kathmandu	737	14:40	14:40	14:51	14:55	0:04	0:11	0:20	14:31	REMOTE
BG089	Bangkok	737	18:00	17:55	18:25	18:32	0:07	0:30	0:42	17:43	REMOTE
BS316	Kuala Lumpur	737	17:50	17:39	17:46	17:54	0:08	0:07	0:14	17:32	REMOTE
BG122	Muscat	777	15:00	15:15	15:21	15:33	0:12	0:06	0:14	15:07	PBB
EK586	Dubai	777	17:20	18:04	18:08	18:19	0:11	0:04	0:10	17:58	PBB
BG126	Doha	777	9:15	10:05	10:10	10:18	0:08	0:05	0:11	9:59	PBB
KU285	Kuwait	777	10:05	10:56	11:03	11:12	0:09	0:07	0:11	10:52	PBB
UL189	Colombo	330	11:30	11:28	11:30	11:39	0:09	0:02	0:07	11:23	PBB
TG321	Bangkok	777	12:10	12:05	12:09	12:17	0:08	0:04	0:09	12:00	PBB
BG136	Riyadh	777	14:45	15:25	15:30	15:43	0:13	0:05	0:15	15:15	PBB
9W272	Delhi	737	16:20	16:09	16:14	16:28	0:14	0:05	0:08	16:06	PBB
BG085	Singapore	737	18:00	18:25	18:30	18:39	0:09	0:05	0:12	18:18	PBB

Average Time (min) Remote	0:04	0:13	0:22
Average Time (min) PBB	0:10	0:04	0:10

Source: JICA Study Team

Table 3.3-5 Analysis of Survey Result of Time of Arriving International Passengers from Aircraft to Terminal Building

Result	<ul style="list-style-type: none"> → For aircrafts that used the PBB spot, the average time required from aircraft arrival (spot in time) to arrival of the first passenger at the passenger terminal was 4 minutes. → For aircrafts that used the remote spot, the average time required from aircraft arrival (spot in time) to arrival of the first passenger at the passenger terminal was 12 minutes. → For aircrafts that used the remote spot, the average time of deplaning was 7 minutes for weekdays and 10 minutes for weekends at the PBB spot. → There was no big difference between weekdays and holidays.
Analysis	<ul style="list-style-type: none"> → Works to be performed upon on-block of the aircraft include the attachment of a boarding bridge to the aircraft, the door opening operation, and the ship meet by airline staff. → The process may be shortened by improving staff's skill in attaching the boarding bridge. → The passenger deplaning process seems to be relatively smooth considering only a one-door bridge is in operation.

Source: JICA Study Team

(1) Baggage Arrival Time of International Flights

The average time taken from the arrival (on-block) of the aircraft to the placement of the first baggage on the sorting belt was 27 minutes, and the average time for the last baggage was 55 minutes. If the average handling time of baggage is 5 seconds per piece, which is comparable to the Japanese standard, the required time may be shortened by 30%.

The following improvement works are considered necessary:

- Appropriate manpower and equipment arrangement
- Unloading work
- Delivery from shipside
- Work at arrival sorting area

Table 3.3-6 Survey Result of Baggage Arrival Time (Weekday)

Survey Date: 2018/4/25

Flight No.	Destination	Type of Aircraft	Schedule Arrival Time	Arrival Time	First Baggage Arrival Time	Last Baggage Arrival Time	First Baggage Arrival Time form Aircraft Arrival (min)	Total Baggage Waiting Time (min)	Number of Passenger	Number of Baggage	Waiting Time per baggage (sec)
EK582	Dubai	777	8:40	8:32	8:56	10:09	0:24	1:13	350	660	6.64
BG044	Kuwait	777	8:55	8:30	9:05	9:47	0:35	0:42	144	286	8.81
G9517	Sharjah	320	9:00	8:28	9:06	9:20	0:38	0:14	155	218	3.85
GF248	Bahrain	330	8:55	8:57	9:29	9:53	0:32	0:24	145	216	6.67
BG148	Dubai	737	8:55	8:50	9:33	9:54	0:43	0:21	54	92	13.70
RX724	Muscat	737	8:45	9:06	9:40	9:56	0:34	0:16	77	157	6.11
KU285	Kuwait	777	10:05	9:58	10:11	10:56	0:13	0:45	217	253	10.67
BG092	Kolkata	737	9:45	9:35	10:25	10:56	0:50	0:31	135	256	7.27
RX756	Riyadh	737	9:45	9:55	10:40	10:55	0:45	0:15	105	200	4.50
SQ448	Singapore	330	11:35	11:29	11:45	12:09	0:16	0:24	97	142	10.14
9W276	Mumbai	737	11:45	11:33	11:55	12:25	0:22	0:30	N/A	N/A	N/A
UL189	Colombo	330	12:00	11:52	12:15	12:46	0:23	0:31	N/A	N/A	N/A
EK586	Dubai	777	17:20	16:51	17:08	17:42	0:17	0:34	180	320	6.38
QR634	Doha	320	17:15	17:04	17:17	17:39	0:13	0:22	114	192	6.88
RX792	Kolkata	737	17:00	17:07	17:25	17:41	0:18	0:16	163	217	4.42
BG089	Bangkok	737	18:00	17:40	17:55	18:19	0:15	0:24	133	245	5.88
BG085	Singapore	737	17:00	17:50	18:15	18:40	0:25	0:25	101	190	7.89

Average Time (min)	0:27	0:28
Average Time (sec) per Baggage		7.01
Average Number of Baggage per aircraft		242.9

Source: JICA Study Team

Table 3.3-7 Survey Result of Baggage Arrival Time (Weekend)

Survey Date: 2018/6/30

Flight No.	Destination	Type of Aircraft	Schedule Arrival Time	Arrival Time	First Baggage Arrival Time	Last Baggage Arrival Time	First Baggage Arrival Time form Aircraft Arrival (min)	Total Baggage Waiting Time (min)	Number of Passenger	Number of Baggage	Waiting Time per baggage (sec)
EK582	Dubai	777	8:40	8:46	9:18	10:14	0:32	0:56	427	665	5.05
BG248	Dubai	737	9:05	9:15	9:49	10:06	0:34	0:17	123	240	4.25
G9 517	Sharjah	737	9:00	9:25	9:45	10:30	0:20	0:45	168	227	11.89
BG092	Kolkata	737	9:45	9:27	9:56	10:22	0:29	0:26	148	148	10.54
BS334	Doha	737	9:20	9:55	10:15	10:44	0:20	0:29	120	182	9.56
RX756	Riyadh	737	9:10	10:03	10:43	11:04	0:40	0:21	66	95	13.26
BG126	Doha	777	9:15	10:05	10:28	11:11	0:23	0:43	388	794	3.25
KU285	Kuwait	777	10:05	10:56	11:16	12:18	0:20	1:02	286	593	6.27
UL189	Colombo	330	11:30	11:28	11:40	12:22	0:12	0:42	151	156	16.15
TG321	Bangkok	777	12:10	12:05	12:25	12:56	0:20	0:31	287	325	5.72
9W276	Mumbai	737	12:40	12:13	12:45	13:05	0:32	0:20	101	190	6.32
BG072	Kathmandu	737	14:40	14:40	15:12	15:20	0:32	0:08	129	112	4.29
BG122	Muscat	777	15:00	15:15	15:38	17:15	0:23	1:37	365	721	8.07
9W272	Delhi	737	16:20	16:09	16:30	17:02	0:21	0:32	177	170	11.29
BS204	Kolkata	737	16:15	16:09	16:30	16:46	0:21	0:16	152	174	5.52
EK586	Dubai	777	17:20	18:04	18:21	19:09	0:17	0:48	345	540	5.33

Average Time (min)	0:24	0:37
Average Time (sec) per Baggage		6.67
Average Number of Baggage per aircraft		333.3

Source: JICA Study Team

Table 3.3-8 Analysis of the Survey Result of Baggage Reclaim Time (Weekday)

Result	<ul style="list-style-type: none"> → Average time required from the arrival to the return of the first baggage to passenger was 27 minutes on weekdays and 24 minutes on weekends. → After the return of the first baggage, the average time required for the return of all the baggage was 28 minutes on weekdays and 37 minutes on weekends. → Average handling time of baggage was 7.01 seconds per piece on weekdays and 6.67 seconds per piece on weekends (calculated as the time required to return of all the baggage divided by the total number of baggage). → As for the average time required for the return of all baggage, the value on weekends is longer by 9 minutes (132%) than on weekdays; however, this is due to the differing average number of baggage (i.e., 242.9 pieces on weekdays, 333.3 pieces on weekends).
Analysis	<ul style="list-style-type: none"> → The average time it takes from the arrival of the aircraft to the first baggage claim is 27 to 55 minutes on weekdays and 24 to 61 minutes on weekends. → The last passenger to claim baggage will leave the airport approximately one hour and a half after arrival. → Comparing with Japanese airport procedures, the process in HSIA takes a longer time. → There are handling issues such as appropriate manpower and equipment arrangement, unloading work, delivery from shipside, and work at the arrival sorting area. → The average handling time per piece of baggage is 7.01 seconds on weekdays and 6.67 seconds on weekends, which is respectively 1.3 to 1.4 times the Japanese standard of 5 seconds per piece. → If EK 582/25 APR (660 pieces of baggage) is handled according to Japanese standards, the time required for baggage return will improve to 51 minutes, which is 22 minutes less than the original time of 1 hour 13 minutes (corresponding to 30% decrease).

Source: JICA Study Team

3.4 Cargo Handling

3.4.1 Summary of Data Collection Survey

The JICA Study Team checked the handling processing speed at the import and export warehouses. The result is that it generally takes a longer time at HSIA than in Japanese airports. There were some cases wherein processes were faster than in Japan, but only because the environmental specificity is different from the Japanese handling environment and the procedure where simple comparison of figures could lead to misunderstandings.

(1) Specific Environment of HSIA

- 1) In Japan and other countries, cargo unloaded from the aircraft is delivered inside the warehouse; while in HSIA, cargo cannot be delivered inside the warehouse due to the congestion of cargo, unit load devices (ULDs), skids, and pallets extended to the ramp side. Therefore, time was measured when the cargo arrived at the edge of widespread cargo in front of warehouse. This results to a shorter recorded time than into the warehouses in Japan.
- 2) In Japan, cargo can be unloaded within 30 minutes after the arrival of the cargo truck in front of the warehouse; however, trucks often have to wait until cargo be unloaded in HSIA, especially in common areas which is very congested. Under this situation, cargo is delivered to the warehouse well in advance of the flight departure to ensure that the flight is not missed. Also, it is sometimes necessary to deliver on the previous night due to traffic regulations and since it takes a long time to scan cargo. Therefore, it is considered unnecessary to build up ULDs in quick handling. However, early cut-off time is not a good service for the customer.
- 3) In principle, customs declaration is made after the cargo check in the warehouse; however, in HSIA, the customs officer receives a declaration document and checks cargo at the entrance of the warehouse. Therefore, the time needed to deliver cargo to the warehouse and the time of customs declaration is almost the same.



Photo 3.4-1 U ULD and Cargo Scattered around the Ramp in front of the Warehouse



Photo 3.4-2 Queue of Trucks Await Unloading of Cargo to the Warehouse

3.4.2 Survey of Import Cargo

The surveyed objects for import cargo are shown below:

Table 3.4-1 Surveved Objects (Import Cargo)

Objects	Scheduled number of flight and piece		Surveyed number of flight/piece/AWB	
	Weekdays	Weekends	Weekdays	Weekends
	Arrival of Aircraft			
(a)	10 flights	10 flights	21 flights	10 flights
	Deliver to Warehouse (at the ramp side)			
(b)	Not specified	Not specified	Not measured	250 pieces of 23 AWB
	Customs Declaration			
(c)	100 pieces	100 pieces	800 pieces of 75 AWB	400 pieces of 40 AWB
	Customs Clearance			
(d)	100 pieces	100 pieces	800 pieces of 75 AWB	400 pieces of 40 AWB
	Cargo Out of Warehouse			

Objects: Import Cargo

(a): From "Arrival of Aircraft" to "Deliver to Warehouse (at the ramp side)"

(b): From "Deliver to Warehouse (at the ramp side)" to "Customs Declaration"

(c): From "Customs Declaration" to "Customs Clearance"

(d): From "Customs Clearance" to "Cargo Out of Warehouse"

AWB: Air Waybill

Source: JICA Study Team

The survey result for import cargo is shown below:

Table 3.4-2 Survey Result (Import Cargo)

Item	Actual Time	In Japan	Comparison	Implication
(a)	1 hour 37 minutes	Within 5 hours	Very short	Measured when the ULD arrives near the ramp side
(b)	3.4 days	18 hours	Very long	Infer complicated procedure and clearing fees related to customs clearance and duty
(c)	2.4 days	6 hours	Very long	Infer human factor of customs clearance and duty
(d)	40 minutes	6 hours	Very short	Infer procedure after customs clearance is different

*The measurement of the actual time of delivery of all cargo of a particular flight into the warehouse is not possible because of security reasons concerning survey staff who have to check out air waybills (AWBs) and ULDs until break down is complete and make sure cargo is brought into the warehouse for nights long.

Source: JICA Study Team

3.4.3 Export Cargo Handling

Surveyed objects for export cargo are shown below:

Table 3.4-3 Surveyed Objects (Export Cargo)

Objects	Scheduled Number of Flight and Piece		Surveyed Number of Flight/Piece/AWB	
	Weekdays	Weekends	Weekdays	Weekends
	Arrival of Truck			
(e)	Not specified	Not specified	4 trucks	5 trucks
	Cargo Delivered to Warehouse (= Customs Declaration)			
(f)	100 pieces	100 pieces	110 pieces of 10 AWB	10 pieces of 10 AWB 10
	Start of Build Up (B/U) of ULD			
(g)	100 pieces	100 pieces	200 pieces of 19 AWB	110 pieces of 10 AWB
	Completion of ULD B/U (= Cargo Out of Warehouse)			
(h)	10 flights	10 flights	11 flights	10 flights
	Departure of Flight			

Objects: Export Cargo

(e): From “Arrival of Truck” to “Cargo Delivered to Warehouse”

(f): From “Cargo delivered to warehouse” to “Start to B/U ULD”

(g): From “Start to B/U ULD” to “Completion of ULD B/U”

(h): From “Completion of ULD B/U” to “Departure of flight”

Source: JICA Study Team

The survey result of export cargo is shown below:

Table 3.4-4 Survey Result (Export Cargo)

Item	Actual Time	In Japan	Comparison	Implication
(e)	6 hour 38 minutes	15 minutes	Very long	It is inferred that no space is available to unload cargo especially in Unreserved Cargo area when a truck arrives.
(f)	5 hour 53 minutes	4 hours	A bit long	It is inferred that it takes time to secure space to build up ULD since it was measured in the Common area.
(g)	3 hour 8 minutes	30 minutes	Very long	It is inferred that it takes a long time to complete at night in time for the next morning flight.
(h)	10 hour 58 minutes	20 minutes	Very fast	It is inferred that cargo is carried in the warehouse well in advance until the departure of flight.

Source: JICA Study Team

3.5 Customs/Immigration

3.5.1 Site Survey Method

(1) Time Required for Processing Passengers by Customs and Immigration

The JICA Study Team measured the time required for processing passengers at the departure and arrival customs office and calculated the average time per passenger (waiting time and processing time combined). The survey was done ten times, each at one hour durations, for departure and arrival both on weekdays and weekends. The flight sample for the survey was distributed evenly in terms of timing, day of the week, destination, and nationality of the passengers.

Table 3.5-1 Site Survey Method (Time Required for Processing Passengers by Immigration)

Aspect		Survey Item
Location		Departure and arrival in the immigration area
Survey Items		Measure the time required for processing passengers at the departure and arrival customs office and calculate the average time per passenger (waiting time and processing time combined).
Designated Passenger		Conduct the survey ten times, each at one-hour durations, for departure and arrival both on weekdays and weekends. Distribute the flight sample for the survey evenly in terms of timing, day of the week, destination, and nationality of the passengers.
How to Record	Start of time count	1. When the passenger enters the immigration area 1-1. Hands out a paper with a written time to the passenger 2. When the passenger hands out the passport to the officer
	End of time count	1-2. When the passenger goes out from the immigration area after completion of the process 1-3. Record the time when the passenger goes out 2.1. When the passenger receives the passport from the officer
Surveyor Equipment		Surveyor x5: Around the immigration desk and the exit for the process As the surveyors are not permitted to enter into the immigration area, they record on paper their observations around the exit.

Source: JICA Study Team

(2) Time Required for Customs Clearance Processing of Departing and Arriving Passengers

The JICA Study Team conducted a survey on the time required for customs clearance processing of departing and arriving passengers, and calculated the average time and distribution based on the number of sample cases. Surveys were done ten times, each at one-hour durations, for a total of two days (one weekday and one weekend). The time and the destination of flights to be surveyed must be spread out per flight schedule.

Table 3.5-2 Site Survey Method (Time Required for Customs Clearance Processing of Departing and Arriving Passengers)

Aspect		Survey Item
Location		Departure and arrival customs area
Survey Items		Measure the time required for processing passengers at the arrival customs office and calculate the average time per passenger (waiting time and processing time combined). Survey for departure customs was not conducted as they do not execute the customs check for departures. (Customs check at the departure gate is only done on special cases.)
Designated Passenger		Conduct the survey ten times, each at one-hour durations, for departure and arrival both on weekdays and weekends. Distribute the flight sample for the survey evenly in terms of timing, day of the week, and destination. Surveys were designated only for Bangladeshis, as foreigners are not checked.
How to record	Time of start count	1. When the passenger gets into the queue 1.1. Record the time when the passenger gets into the queue
	Time of end count	1.2. When the passenger receives the baggage after the x-ray check 1.3. Record the time when the process is completed
Surveyor: Equipment		Surveyor x1: Around the x-ray machine where the start of the queue and process is seen

Source: JICA Study Team

3.5.2 Overview of Survey Results

The survey result regarding immigration and customs are shown in Table 3.5-3 and Table 3.5-4.

Table 3.5-3 Survey Result of Immigration (Weekday)

Survey Date: 2018/4/25

Immigration	Time	Starting Time	Finishing Time	Nationality	Sample	Average Time (min)
Departure	Total Time	8:48	18:50	Bangladesh	208	5.9
				Foreigner	14	4.6
				Total	222	5.8
	Processing Time	16:47	18:13	Bangladesh	42	1.9
				Foreigner	2	3.0
				Total	44	2.0
Arrival	Total Time	8:48	18:04	Bangladesh	313	3.7
				Foreigner	137	12.2
				Total	450	6.3
	Processing Time	11:40	18:26	Bangladesh	56	2.1
				Foreigner	47	5.1
				Total	103	3.5

Source: JICA Study Team

Table 3.5-4 Survey Result of Immigration (Weekend)

Survey Date: 2018/6/30

Immigration	Time	Starting Time	Finishing Time	Nationality	Sample	Average Time (min)
Departure	Total Time	10:05	19:13	Bangladesh	93	9.5
				Foreigner	28	4.3
				Total	121	8.3
	Processing Time	10:06	19:13	Bangladesh	93	2.7
				Foreigner	28	1.8
				Total	121	2.5
Arrival	Total Time	9:50	18:38	Bangladesh	60	5.9
				Foreigner	81	9.1
				Total	141	7.7
	Processing Time	9:57	18:38	Bangladesh	60	1.6
				Foreigner	81	3.8
				Total	141	2.8

Source: JICA Study Team

Table 3.5-5 Analysis of Survey Results of Departure and Arrival Immigration Process Time

Result	<p>Departure Immigration</p> <ul style="list-style-type: none"> → The average waiting and process time is 5.8 minutes on weekdays and 8.3 minutes on weekends. → The average process time is 2.0 minutes on weekdays and 2.5 minutes on weekends. <p>Arrival Immigration</p> <ul style="list-style-type: none"> → The average waiting and process time is 6.3 minutes on weekdays and 7.7 minutes on weekends. → The average process time is 3.5 minutes on weekdays and 2.8 minutes on weekends.
Analysis	<ul style="list-style-type: none"> → Since it was not a peak time during the survey, there was no congestion and the departure inspection site did not overflow. → The passport reader malfunctioned in both the arrival and departure areas. → Many Bangladeshis regrouped into rows due to inadequate documentation which lengthened the average process time.

Source: JICA Study Team

3.6 Simulation Analysis

3.6.1 Method

(1) Objective

The objective of this analysis is to propose an effective measurement towards the current problems regarding the passenger service in HSIA by assessing the current facility operation capacity and service level via Comprehensive Airport Simulation Technology (CAST), a simulation software specialized for an airport.

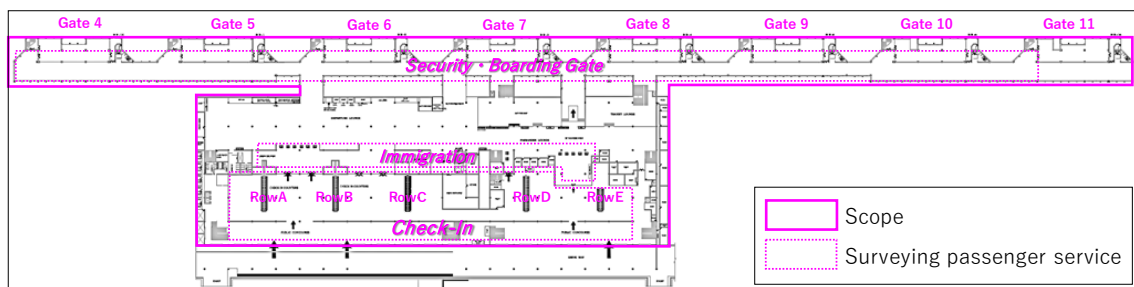
(2) Approach

The evaluation was conducted by creating a terminal building model with the airport simulation software known as CAST. CAST is created by the Airport Research Center, a firm in Germany. It is a multi-agent simulation software which specializes in analyzing airports. The target could be chosen from the passengers and baggage inside the terminal building, the vehicles at the curbside, the movement of the aircraft, the ground support equipment (GSE) at the airside. The software was created to study the operation capacity and the LoS of the airport and to measure its advance effect.

3.6.2 Premise

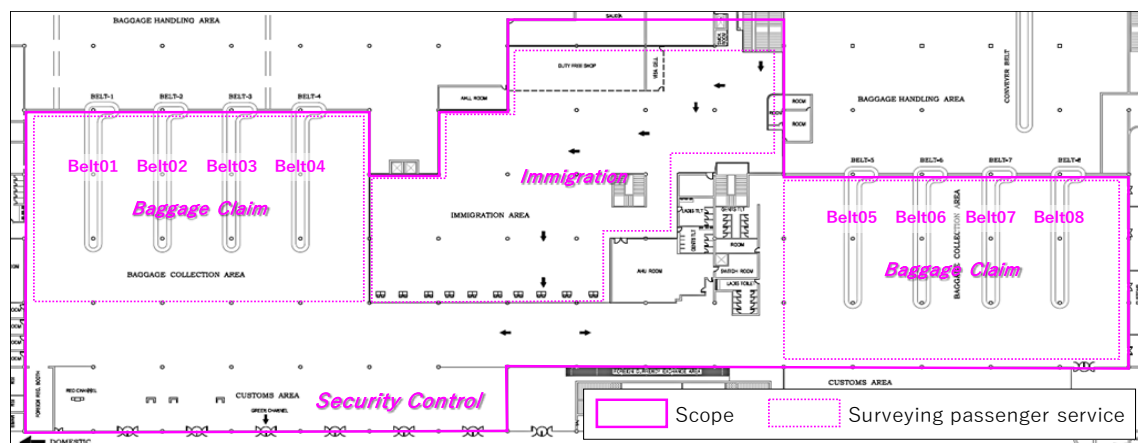
(1) Scope

The study scope of this simulation is shown in Figure 3.6-1 and Figure 3.6-2. The information regarding the current operation situation and building plan such as the distribution of Row A~E, the number of check-in counters, the shape of the waiting queue, etc., were accumulated from the photograph and the movie that was taken at the airport.



Source: JICA Study Team

Figure 3.6-1 Scope of the Simulation (Departure)



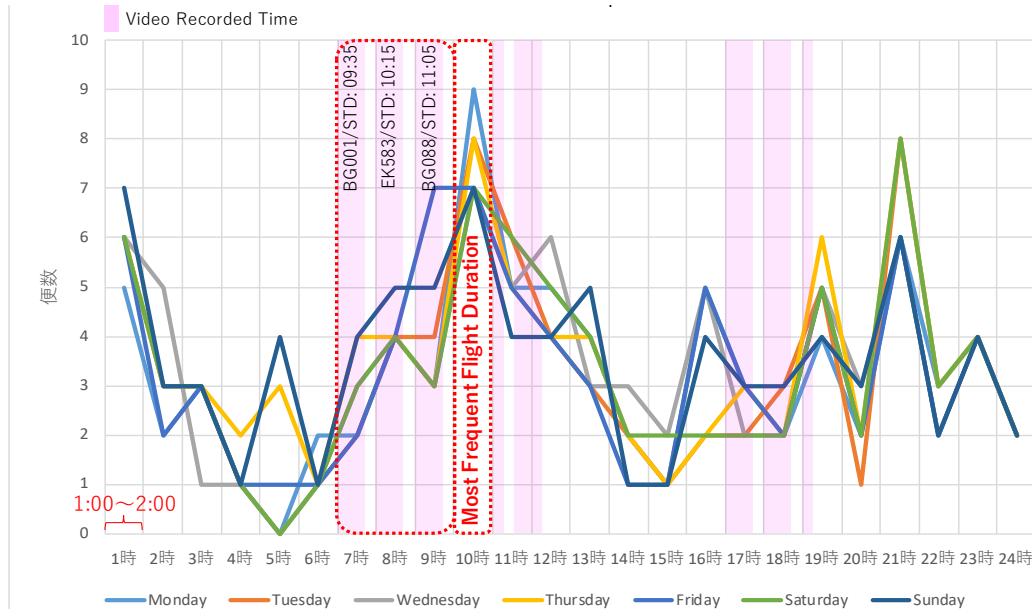
Source: JICA Study Team

Figure 3.6-2 Scope of the Simulation (Arrival)

(2) Target Period

< Departure > Target period: 8:00~11:00 for a total of 3 hours (peak hour in the morning)

The target departure period was selected considering the amount of data accumulated from the survey of the existing situation conducted in April and the estimated peak hour of the 2018 Summer Schedule of HSIA.

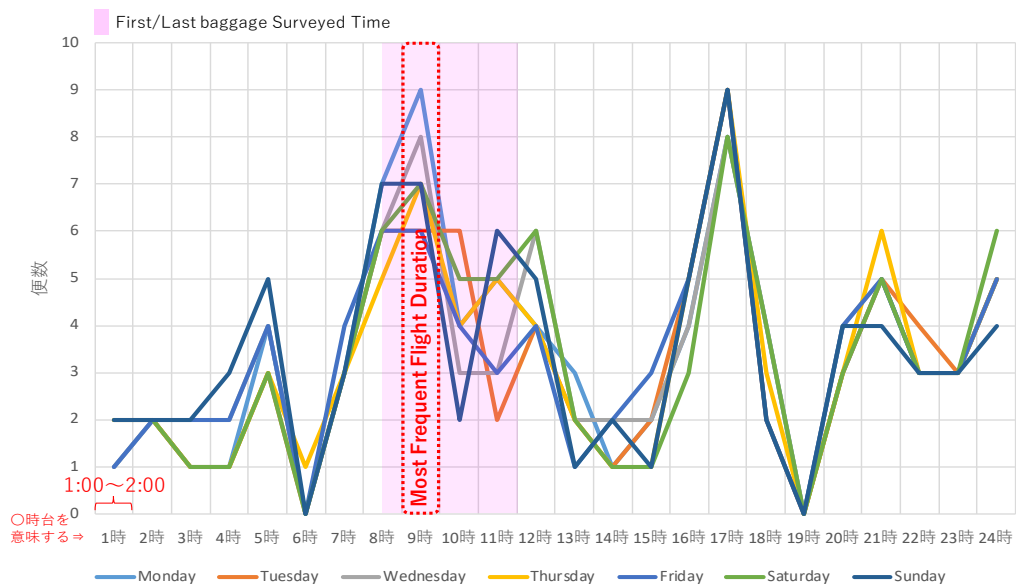


Source: JICA Study Team

Figure 3.6-3 Peak Hour (Departure)

< Arrival > Target period: 9:00~12:00 for a total of 3 hours (peak hour in the morning)

The target arrival period was selected considering the amount of first/last baggage arrival data accumulated from the survey of existing situation conducted in April and the estimated peak hour of the 2018 Summer Schedule of HSIA.



Source: JICA Study Team

Figure 3.6-4 Peak Hour (Arrival)

(3) Flight Schedule

The established departure and arrival flight schedule used in the simulation is shown in Table 3.6-1 and Table 3.6-2.

Table 3.6-1 Flight Schedule (Departure)

Flight Number	Scheduled Time	Airline Code	Gate	Airport Code (e.g.)
BBC084	2018/4/25 8:25	BBC	06	SIN
UBG315	2018/4/25 8:50	UBG	07	KUL
BBC001	2018/4/25 9:35	BBC	04	LHR
ABY9518	2018/4/25 9:40	ABY	05	SHJ
SEJ072	2018/4/25 9:50	SEJ	07	CCU
JAI271	2018/4/25 10:00	JAI	06	DEL
UBG201	2018/4/25 10:00	UBG	10	CCU
NVQ721	2018/4/25 10:00	NVQ	09	CCU
UAE583	2018/4/25 10:15	UAE	08	DXB
GFA249	2018/4/25 10:30	GFA	04	BAH
BBC071	2018/4/25 10:30	BBC	11	KTM
RGE791	2018/4/25 10:30	RGE	07	CGP
QTR637	2018/4/25 11:00	QTR	05	DOH
BBC088	2018/4/25 11:05	BBC	09	BKK
FDB584	2018/4/25 11:30	FDB	06	DXB
KAC286	2018/4/25 11:35	KAC	11	KWI
UBG211	2018/4/25 12:30	UBG	08	KTM
JAI275	2018/4/25 12:45	JAI	07	BOM
BBC060	2018/4/25 12:45	BBC	06	RGN
SIA449	2018/4/25 12:50	SIA	09	SIN
MXD163	2018/4/25 12:55	MXD	10	KUL
NVQ723	2018/4/25 13:25	NVQ	04	CCU
THA322	2018/4/25 13:35	THA	05	BKK

Source: JICA Study Team

Table 3.6-2 Flight Schedule (Arrival)

Flight Number	Scheduled Time	Airline Code	Belt	Airport Code
UAE582	2018/4/25 8:40	UAE	Belt08	DXB
RGE724	2018/4/25 8:45	RGE	Belt07	MCT
BBC044	2018/4/25 8:55	BBC	Belt04	KWI
GFA248	2018/4/25 8:55	GFA	Belt06	BAH
BBC148	2018/4/25 8:55	BBC	Belt03	DXB
ABY9517	2018/4/25 9:00	ABY	Belt05	SHJ
BBC092	2018/4/25 9:45	BBC	Belt04	CCU
RGE756	2018/4/25 9:45	RGE	Belt07	DMM
KAC285	2018/4/25 10:05	KAC	Belt03	KWI
SIA448	2018/4/25 11:35	SIA	Belt04	SIN

Source: JICA Study Team

(4) Extraction of Arrangement of Main Parameter

1) Processing Time

The processing time for each stage was established from the result of the survey conducted in April and June 2018, which considered the sample number and data precision.

a) Check-in Counter

The average processing times of the check-in counters of Bangladeshi airlines and foreign airlines are shown in Table 3.6-3.

However, 5% of the sample was removed since there were few samples with extremely long processing times.

Table 3.6-3 Processing Time of the Check-in Counter

Airline	Average check-in processing time (sec)
Bangladeshi Airline (BBC/RGE/UBG/NVQ)	206
Foreign Airline	174

Source: JICA Study Team

b) Immigration (Departure)

The average processing times of departure immigration, considering a small number of foreigner samples, are shown in Table 3.6-4.

Table 3.6-4 Departure Immigration Processing Time

Sample	Average departure immigration processing time (sec)
Bangladesh	117
Foreigner	

Source: JICA Study Team

c) Security Control

The average processing times for the security control of Bangladeshi airlines and foreign airlines are shown in Table 3.6-5.

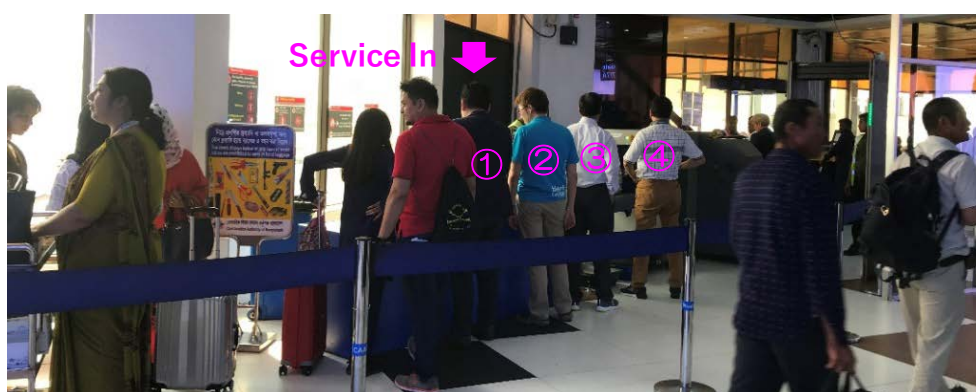
Regarding the photograph taken at the airport, there were four people between service in (placing of hand baggage in the inspection machine) to service out (collecting the hand baggage). Therefore, in this simulation, it is set that four people will pass the inspection machine between service in and service out.

However, 5% of the sample was removed since there were few samples with extremely long processing times.

Table 3.6-5 Security Control Processing Time

Airline	Average Security Processing Time (sec)	
	From Service In to Service Out	Through Put of Service In
Bangladeshi Airline (BBC/RGE/UBG/NVQ)	132	33
Foreign Airline	95	24

Source: JICA Study Team

**Photo 3.6-1 Security Control**

d) Immigration (Arrival)

The average processing time of arrival immigration considering data precision is shown in Table 3.6-6..

Table 3.6-6 Arrival Immigration Processing Time

	Sample	Average Arrival Immigration Processing Time (sec)
Bangladesh	17	42
Foreigner	70	168

Source: JICA Study Team

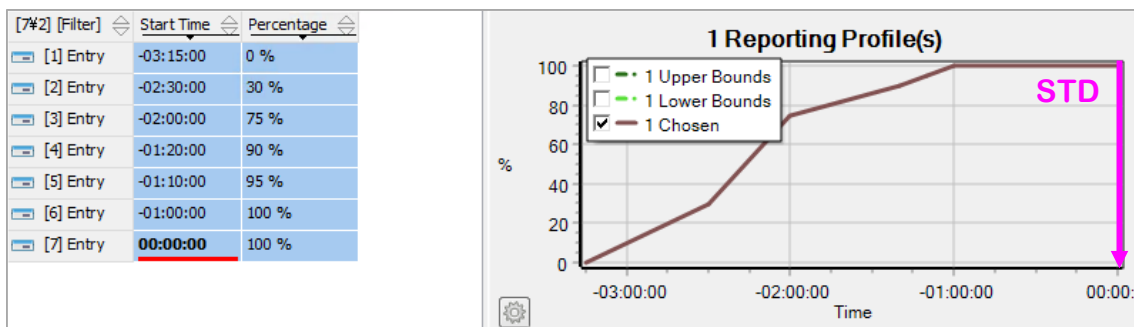
2) Show-up Distribution

< Check-in Counter >

The show-up time distribution at the end of the waiting queue was set to match the current situation of the check-in counter show-up time, the number of the people in the waiting queue, and the counter opening situation from the video data of SriLankan Airlines flight taken on 29 June 2018.

(Based on the show up time distribution of the end of the waiting queue)

It was adjusted and established to match the current congested situation during the survey referring to the show-up distribution shown in Figure 3.6-5.



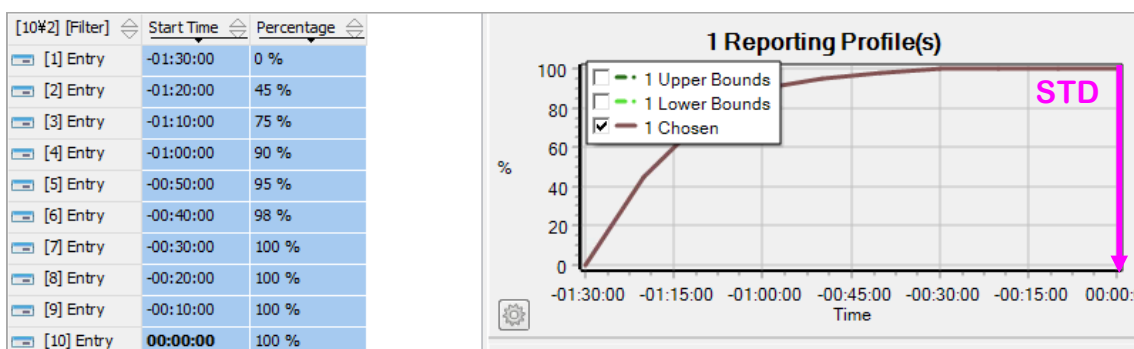
Source: JICA Study Team

Figure 3.6-5 Show-up Time Distribution (Check-in Counter)

< Security Control >

The show-up time distribution at the end of the waiting queue was set based on the photograph and the boarding gate announced time which was on the Flight Information Display (FID).

(Base of the show up time distribution of end of the waiting queue)



Source: JICA Study Team

Figure 3.6-6 Show-up Time Distribution (Security Control)

3) Boarding Class

The passenger boarding ratio for each travel class (economy class/business+first class) was estimated by confirming the seat information of the target flight according to SEATGURU.com and the airlines website.

Table 3.6-7 Passenger Boarding Ratio

Flight Number	Scheduled Time	Acft Type	The number of seats				Route
			Total	Economy	Business	First	
BBC084	8:25	738	162	150	12	0	DAC-SIN
UBG315	8:50	738	164	156	8	0	DAC-KUL
BBC001	9:35	77W	419	384	35	0	DAC-LHR
ABY518	9:40	320	162	162	0	0	DAC-SHJ
SEJ072	9:50	DH8	78	78	0	0	DAC-CCU
JAI271	10:00	73H	168	156	12	0	DAC-DEL
UBG201	10:00	738	164	156	8	0	DAC-CCU
NVQ721	10:00	ATWG	68	68	0	0	DAC-CCU
UAE583	10:15	77W	427	385	42	0	DAC-DXB
GFA249	10:30	330	255	247	8	0	DAC-BAH
BBC071	10:30	738	162	150	12	0	DAC-KTM
RGE791	10:30	73N	167	159	8	0	DAC-CCU-CGP
QTR637	11:00	333	259	223	24	12	DAC-DOH
BBC088	11:05	738	162	150	12	0	DAC-BKK
FDB584	11:30	73H	174	162	12	0	DAC-DXB
KAC286	11:35	77W	334	290	36	8	DAC-KWI
UBG211	12:30	738	164	156	8	0	DAC-KTM
JAI275	12:45	739	166	138	28	0	DAC-BOM
BBC060	12:45	DH4	74	74	0	0	DAC-RGN
SIA449	12:50	333	285	255	30	0	DAC-SIN
MXD163	12:55	738	162	150	12	0	DAC-KUL
NVQ723	13:25	ATWG	68	68	0	0	DAC-CCU
THA322	13:35	772	309	279	30	0	DAC-BKK

Economy Class	Priority Class (Business + First)
90%	10%

Source: SEATGURU.com, Airlines website

4) Passenger Attribute

a) Bangladeshi/Foreigner Ratio

The passenger nationality ratio was adjusted and set according to the ratio of the passenger nationality (Bangladeshi/Foreigner) which was taken at the departure/arrival immigration survey.

b) Cart Usage Ratio

The departure car usage ratio, which is shown in Table 3.6-8, was decided according to the video data from the site survey.

On the other hand, the arrival cart usage ratio is decided by assuming that half of the passengers with more than one baggage use a cart.

Table 3.6-8 Cart Usage Attribute

Sample	Cart	Cart Utilization Ratio
117	40	34%

Source: JICA Study Team

5) Check-in Assignment Table

Considering the airline usage trend of Rows A~E and the result of the survey conducted in April 2018, the estimated check-in counter assignment table is shown in Table 3.6-9.

The colored cells indicate that the particular check-in counter is open. The simulation showed a common situation in HSIA wherein multiple airlines share the same row at the same time.

Table 3.6-9 Estimated Check-in Counter Assignment Table

	6:00					7:00					8:00					9:00					10:00					11:00					12:00																		
	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50							
Row A_L						ABY518/9:40																																											
													FDB584/11:30																																				
																										SIA449/12:50																							
Row A_R						UAE583/10:15																																											
													KAC286/11:35																																				
																																						THA322/13:35											
Row B_L						NVQ721/10:00																																											
																										MXD163/12:55																							
Row B_R						JAI271/10:00																																											
																										JAI275/12:45																							
Row C_L						UBG315/8:50, UBG201/10:00, UBG211/12:30																																											
													RGE791/10:30																																				
																																						NVQ723/13:25											
Row D_L						GFA249/10:30																																											
Row D_R						BBC084/8:25, BBC071/10:30, BBC088/11:05, BBC060/12:45																																											
Row E_L						BBC001/9:35																																											
Row E_R						SEJ072/9:50																																											
																																						QTR637/11:00											

Source: JICA Study Team

6) Gate Assignment Table

Considering the gate reporting time* collected from the FID on 29 June 2018 and the aircraft delay time in Table 3.6-10, the estimated gate assignment table is established and shown in Table 3.6-11.

* Gate Reporting Time: Time distribution that shows when the passenger will show up at the boarding gate before the estimated boarding time.

Table 3.6-10 Gate Reporting Time Survey Result

	Gate Reporting Time (hour : min)	Delay Time (hour : min)
Maximum	3:45	1:01
Minimum	0:35	0:01
Average	1:17	0:19

Source: JICA Study Team

Table 3.6-13 Baggage Claim Assignment Table

	8:00			9:00					10:00					11:00					12:00						
	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	30	40	50	0	10	20	
Belt01																									
Belt02																									
Belt03																									
Belt04																									
Belt05																									
Belt06																									
Belt07																									
Belt08																									

From First Bag to Last Bag

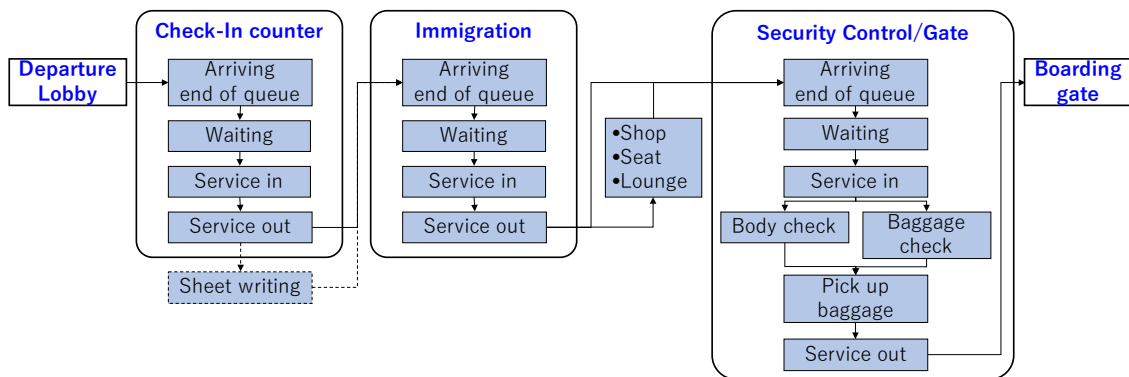
Source: JICA Study Team

(5) Number of Operating Counter

Since there is no time schedule for number of operating counter, it is assumed that all the counters were open at the peak hours.

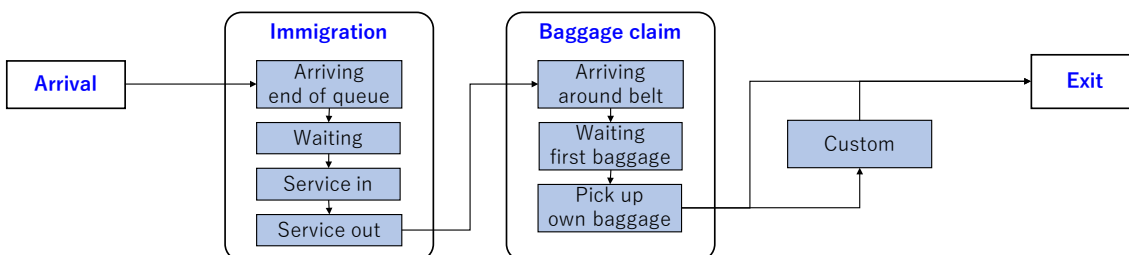
(6) Procedure Flow

The passenger procedure flow for the departure and arrival simulation is shown in Figure 3.6-7 and Figure 3.6-8.



Source: JICA Study Team

Figure 3.6-7 Procedure Flow (Departure)



Source: JICA Study Team

Figure 3.6-8 Procedure Flow (Arrival)

(7) Study Cases

The study cases are shown in Table 3.6-14.

Table 3.6-14 Study Cases

		Load Factor		
		Departure 60% (Survey in April)	Arrival 70% (Survey in April)	Departure + Arrival 90% (Survey in June)
Flight Schedule	Departure: 23 flights Arrival: 10 flights	Case 1 (Base Case)		Case 2
	Departure: 27 flights Arrival: 18 flights			Case 3

*Load Factor is a passenger occupation ratio of the aircraft.

Source: JICA Study Team

(8) Evaluation Indicator for the Result of the Survey

The evaluation and analysis were conducted using the LoS diagram and the LoS guideline in the Airport Development Reference Manual. The LoS diagram allows the evaluation of the processing facilities by using two indicators which are the LoS of time and space. The evaluation is divided into three stages.

<LoS Space-Time Diagram (Processing Facilities)>

LoS Parameters		SPACE		
		Over-Design	Optimum	Sub-Optimum
		Excessive or empty space	Sufficient space to accommodate necessary functions in a comfortable environment	Crowded and uncomfortable
MAXIMUM WAITING TIME	Over-Design Overprovision of resources	OVER-DESIGN	Optimum	SUB-OPTIMUM ▶ Consider Improvements
	Optimum Acceptable processing and waiting times	Optimum	OPTIMUM	SUB-OPTIMUM ▶ Consider Improvements
	Sub-Optimum Unacceptable processing and waiting times	SUB-OPTIMUM ▶ Consider Improvements	SUB-OPTIMUM ▶ Consider Improvements	UNDER-PROVIDED ▶ Reconfigure

Source: Airport Development Reference Manual 10th Edition

Figure 3.6-9 LoS Space-Time Diagram (Processing Facilities)

<LoS Guidelines for Airport Terminal Facilities>

Table 3.6-15 Evaluation Indicator for Simulation Result

LoS Guidelines	SPACE GUIDELINES (m ² /PAX)			MAXIMUM WAITING GUIDELINES Economy Class (minutes)			MAXIMUM WAITING GUIDELINES Business Class/ First Class/ Fast Track (minutes)			OTHER GUIDELINES & REMARKS		
	Over-Design	Optimum	Sub-Optimum	Over-Design	Optimum	Sub-Optimum	Over-Design	Optimum	Sub-Optimum	Over-Design	Optimum	Sub-Optimum
Public Departure Hall	> 2.3	2.0-2.3	< 2.0	N/A			N/A			Optimum proportion of seated occupations: 15-20%*		
Check-in	Self-Service Kiosk (Boarding Pass/ Bag Tagging)	> 1.8	1.3-1.8	< 1.3	< 1	1-2	> 2	< 1	1-2	> 2		
	Bag Drop Desk (queue width: 1.4-1.6m)	> 1.8	1.3-1.8	< 1.3	< 1	1-5	> 5	< 1	Business Class 1-3	> 3		
	Check-in Desk (queue width: 1.4-1.6m)	> 1.8	1.3-1.8	< 1.3	< 10	10-20	> 20	< 3	First Class 3-5	> 3	> 5	> 3
Security Control (queue width: 1.2m)	> 1.2	1.0-1.2	< 1.0	< 5	5-10	> 10	< 1	Fast Track 1-3	> 3			
Emigration Control (Outbound Passport Control) (queue width: 1.2m)	> 1.2	1.0-1.2	< 1.0	< 5	5-10	> 10	< 1	1-3	> 3			
Gate Hold Seating Rooms/ Departure Lounges	Seating	> 1.7	1.5-1.7	< 1.5	N/A			N/A			Optimum proportion of seated occupations: 50-70%*	
	Standing	> 1.2	1.0-1.2	< 1.0							Maximum Occupation Rate: < 60% 60-70%* > 70%	
Immigration Control (Inbound Passport Control)(queue width: 1.2m)	> 1.2	1.0-1.2	< 1.0	< 5	5-10	> 10	< 1	Fast Track 1-5	> 5			
Baggage Reclaim	Narrow Body Aircraft	> 1.7	1.5-1.7	< 1.5	< 0	0/15	> 15				The first waiting time value relates to "first passenger to first bag"	
	Wide Body Aircraft	> 1.7	1.5-1.7	< 1.5	< 0	0/25	> 25	< 0	0/15	> 15	The second waiting time value relates to "last bag to belt" continuing from the first bag delivery)**	
Customs Control	> 1.8	1.3-1.8	< 1.3	< 1	1-5	> 5	< 1	1-5	> 5	Waiting time refer to a procedure when 100% of the passengers are being checked by Customs		
Public Arrival Hall	> 2.3	2.0-2.3	< 2.0	N/A			N/A			Optimum proportion of seated occupations: 15-20%*		

Source: JICA Study Team, Based on Airport Development Reference Manual 10th Edition

3.6.3 Result of the Analysis

(1) Case 1 (Base Case)

1) Validation

The validation of the simulation was confirmed by checking the photograph taken at the airport against the simulation model set to the same time.

< Departure >

(Check-in Counter) The validation of the check-in counter area was confirmed since the simulation model was able to replicate a situation similar to the actual happenings with the distinctive trend. Such trends are the congested situation in front of Row D with Biman Airlines passengers and the long waiting queue in front of Row E.



Source: JICA Study Team

Figure 3.6-10 Confirming the Validation of Check-in Counter

(Departure Immigration)

The validation of the departure immigration area was confirmed since the simulation model was able to replicate a similar situation with a waiting queue of Bangladeshi passengers.



Source: JICA Study Team

Figure 3.6-11 Confirming the Validation of Departure Immigration

(Security Control)

The validation of the security control area was confirmed since the simulation model was able to replicate a similar situation wherein lots of passengers create a long waiting queue in front of the boarding gate.



Source: JICA Study Team

Figure 3.6-12 Confirming the Validation of Security Control

< Arrival >

(Baggage Claim) The validation of the baggage claim area was confirmed since the simulation model was able to replicate a similar situation where the area is congested with lots of passengers with baggage carts.



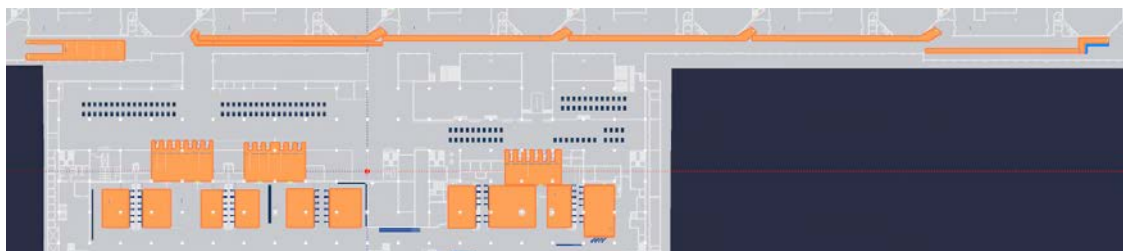
Source: JICA Study Team

Figure 3.6-13 Confirming the Validation of Baggage Claim

2) Space LoS (Departure)

Regarding the scope of Space LoS, the area allocated for each passenger (m^2/pax) was arranged in chronological order. It shows that the smaller the number, the higher the passenger density will be.

The orange colored area shows the scope of the study for all the processes. (Figure 3.6-14)

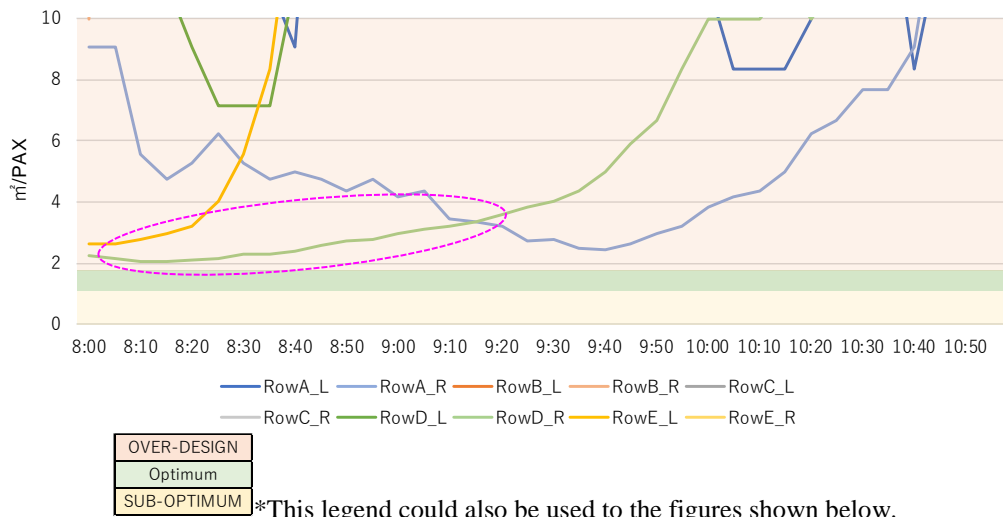


Source: JICA Study Team

Figure 3.6-14 Scope of Space LoS (Departure)

a) Check-in Counter

Regarding the Base Case, Figure 3.6-15 shows that the Space LoS of the check-in counter area could be evaluated as overdesigned since all rows are in the orange Over-Design range. However, Row D-R and Row E-L, the rows in which Biman Airlines is assigned, are temporarily more congested such that they get close to the green Optimum range. The row with the widebody aircraft assignment, such as Boeing 777-300ER, (i.e., Row A-R Emirates Airlines and Kuwait Airways), also gets close to the Optimum range temporarily. There is a concentration of passengers in front of Row D-R between 8:00~9:30.



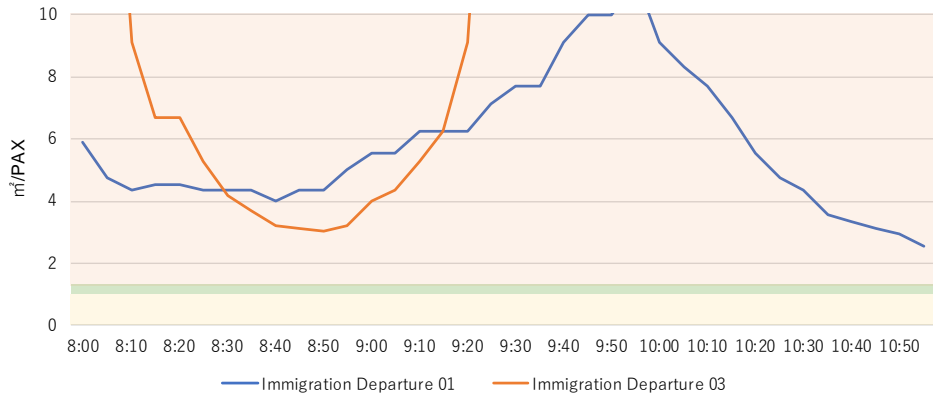
Source: JICA Study Team

Figure 3.6-15 Base Case Space LoS (Check-in Counter)

b) Departure Immigration

Regarding the Base Case, Figure 3.6-16 shows that the Space LoS of the departure immigration area could be evaluated in the Over-Design range for both Immigration Entrances 01 and 03. Immigration Entrance 01 gets relatively congested from 8:00 onwards. On the other hand, Immigration Entrance 03 gets congested only between 8:00 to 9:00.

It could be estimated that Immigration Entrance 01 gets congested between 10:00 to 11:00 such that the Space LoS gets close to the green Optimum range since passengers who check-in at Row A and Row B, where airlines which use widebody aircraft are assigned, flow into Immigration Entrance 01.

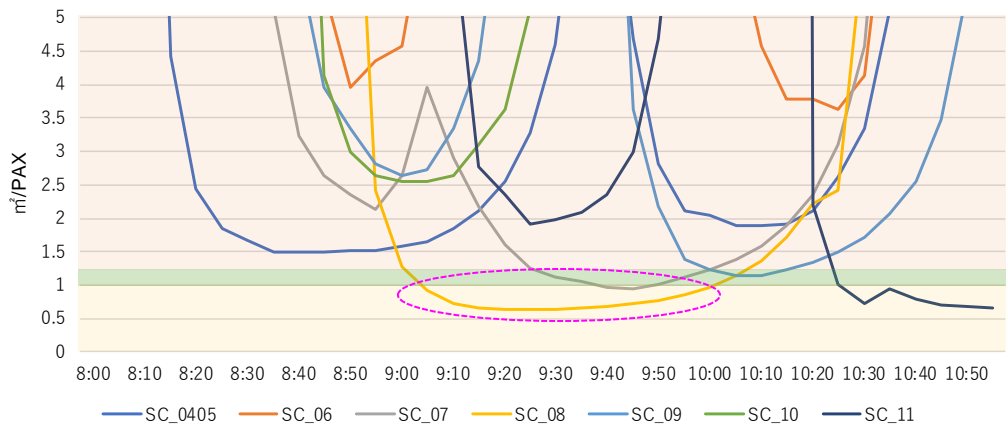


Source: JICA Study Team

Figure 3.6-16 Base Case Space LoS (Departure Immigration)

c) Security Control

Regarding the Base Case, Figure 3.6-17 shows that the Space LoS of the security control area could be evaluated between the Over-Design range and the Optimum range. The congested situation manifested from 20 minutes to an hour. Also, Security Control 08 gets so congested that it was temporarily in the Sub-Optimum range between 9:00 to 10:00.



Source: JICA Study Team

Figure 3.6-17 Base Case Space LoS (Security Control)

3) Space LoS (Arrival)

Regarding the scope of Space LoS, the area allocated for each passenger (m^2/pax) was arranged in chronological order. It shows that as the number gets smaller, the higher the passenger density will be.

The orange area shows the scope of the study for all the processes. (Figure 3.6-18)

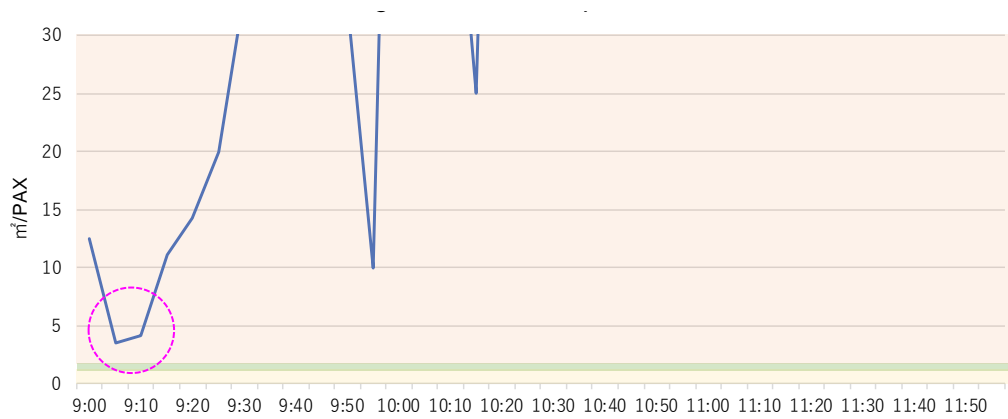


Source: JICA Study Team

Figure 3.6-18 Scope of Space LoS (Arrival)

a) Arrival Immigration

Regarding the Base Case, Figure 3.6-19 shows that the Space LoS of the arrival immigration area could be evaluated in the Over-Design range. However, the arrival flights concentrate before 9:00 and get close to the green Optimum range temporarily.

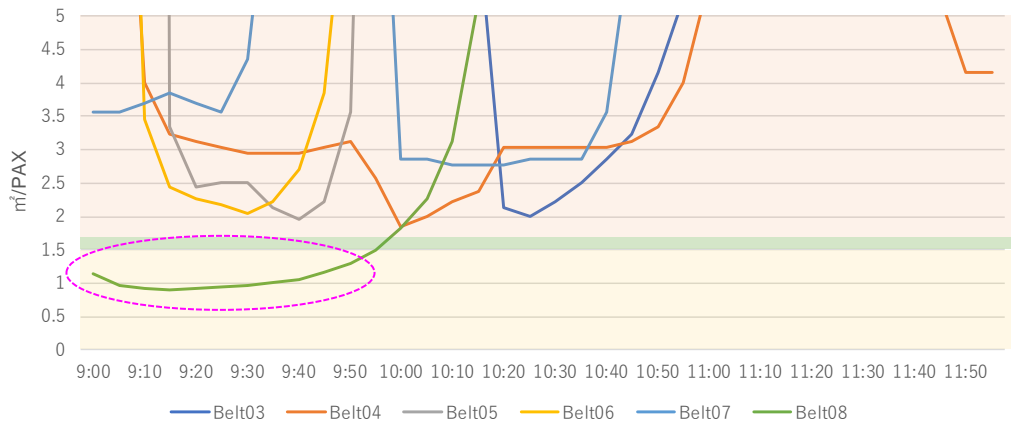


Source: JICA Study Team

Figure 3.6-19 Base Case Space LoS (Arrival Immigration)

b) Baggage Claim

Regarding the Base Case, Figure 3.6-20 shows that the Space LoS of the baggage claim area could be in the Over-Design range. However, Belt 08 was congested such that it was in the Sub-Optimum range for an hour since an Emirates flight carried a large number of passengers and baggage.



Source: JICA Study Team

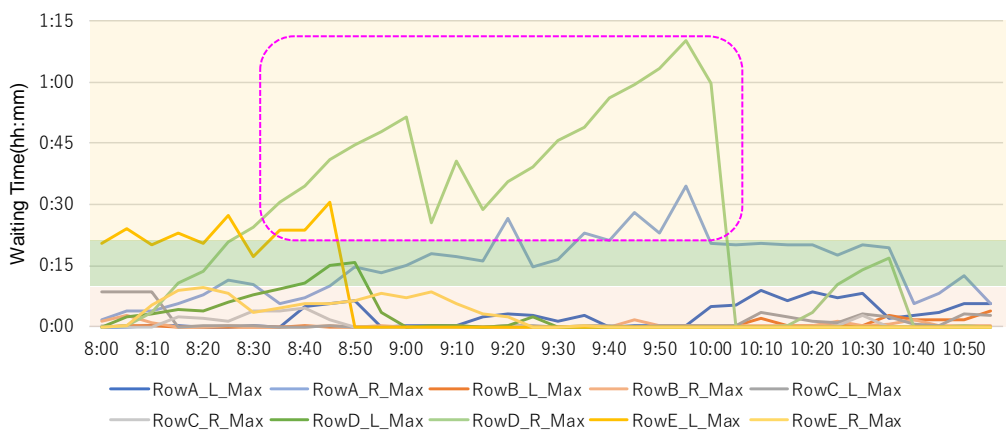
Figure 3.6-20 Base Case Space LoS (Baggage Claim)

4) Maximum Waiting Time (Departure)

Waiting time is defined as the total time from when the passenger shows up at the end of the waiting queue for the process, to the time when the process is finished. The longest waiting time in every 5-minute interval was arranged in chronological order.

a) Check-in Counter

Regarding the Base Case, Figure 3.6-21 shows that the Maximum Waiting Time LoS of the check-in counter area could be evaluated between the Over-Design range and the Optimum range. However, waiting time is quite long for passengers in Row D-R which lies in the Sub-Optimum range most of the time. This is because there are passengers near Row D-R, where Biman Airlines is assigned, waiting for the counters to open. Therefore, a large number of passengers start to show up when the counters open, which makes the maximum waiting time longer than in other rows.

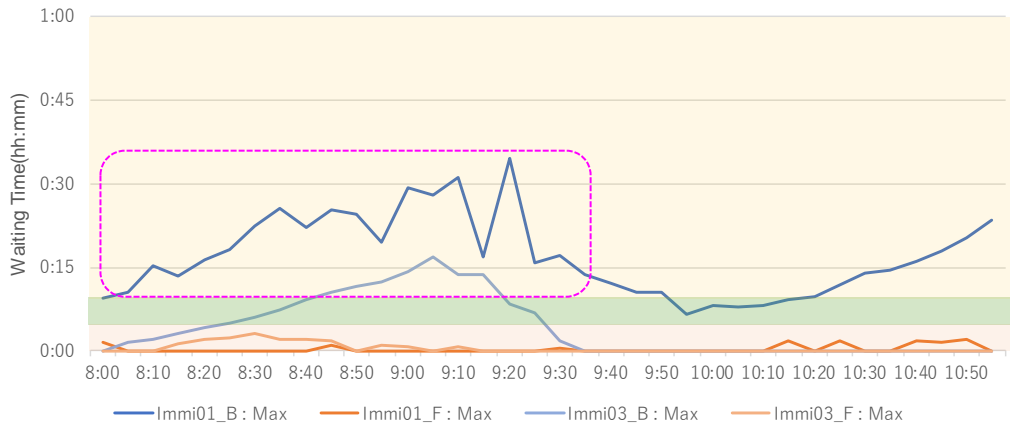


Source: JICA Study Team

Figure 3.6-21 Base Case Maximum Waiting Time LoS (Check-in Counter)

b) Departure Immigration

Regarding the Base Case, Figure 3.6-22 shows that the Maximum Waiting Time LoS of the departure immigration area could be in the Sub-Optimum range for the counters for Bangladesh passport holders, which get congested between 8:00 and 9:30.

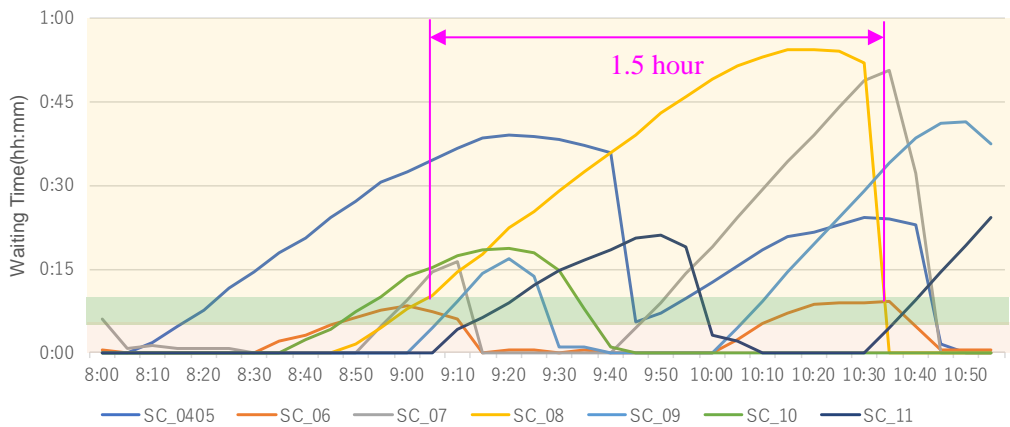


Source: JICA Study Team

Figure 3.6-22 Base Case Maximum Waiting Time LoS (Departure Immigration)

c) Security Control

Regarding the Base Case, Figure 3.6-23 shows that the Maximum Waiting Time LoS of the security control area could be generally considered in the Sub-Optimum range. The longest maximum waiting time was around one hour and a half. The main cause of this is that a large number of passengers shows up at the boarding gate all at once after the boarding gate announcement.



Source: JICA Study Team

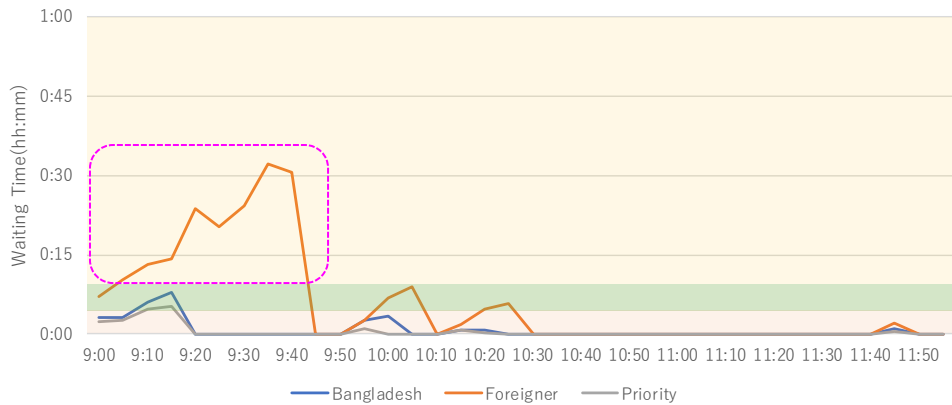
Figure 3.6-23 Base Case Maximum Waiting Time LoS (Security Control)

5) Maximum Waiting Time (Arrival)

Waiting time is defined as the total time from when the passenger shows up at the end of the waiting queue for the process, to the time when the process is finished. The longest waiting time in every 5-minute interval was arranged in chronological order.

a) Arrival Immigration

Regarding the Base Case, Figure 3.6-24 shows the Maximum Waiting Time LoS of the arrival immigration area. The counters for foreigners could be evaluated in the Sub-Optimum range between 9:00 to 9:40.

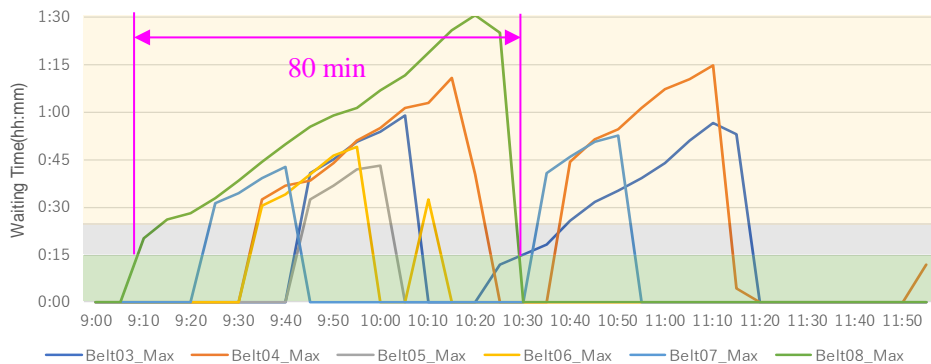


Source: JICA Study Team

Figure 3.6-24 Base Case Maximum Waiting Time LoS (Arrival Immigration)

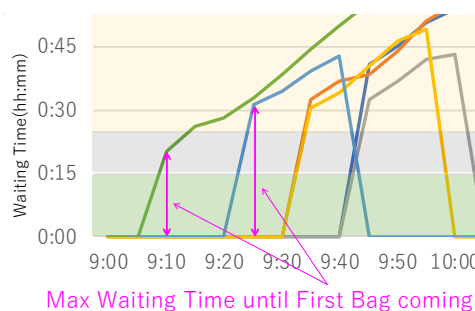
b) Baggage Claim

Regarding the Base Case, Figure 3.6-25 shows that the Maximum Waiting Time LoS of the baggage claim area could be evaluated in the Sub-Optimum range overall. The longest maximum waiting time was around 80 minutes.



*The graph starts when the passenger picks up the first baggage. The red arrow in the graph below shows the maximum waiting time around the baggage handling system (BHS) until the first passenger picks up their baggage.

*The grey range in the graph indicates different LoS values referring to the size of the aircraft. If it was a wide body aircraft, it would be a part of the Optimum range. However, if the aircraft was a narrow body type, it would be a part of the Sub-Optimum range.



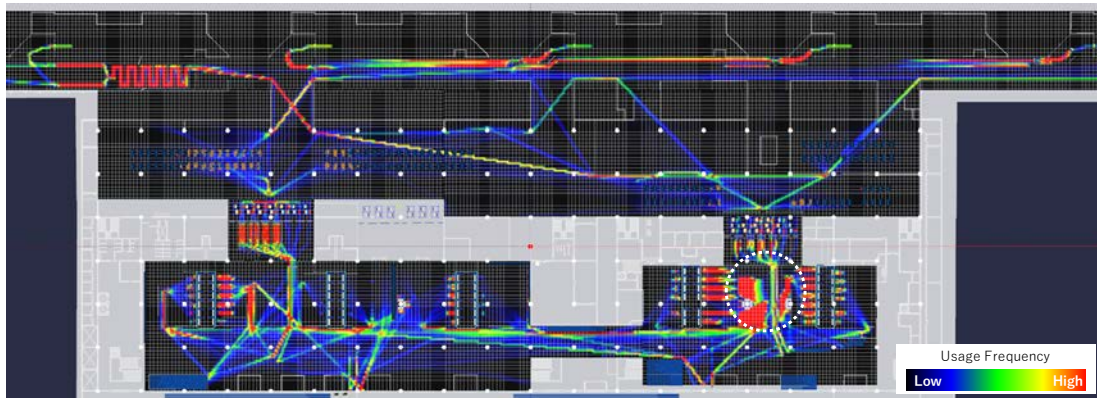
Source: JICA Study Team

Figure 3.6-25 Base Case Maximum Waiting Time LoS (Baggage Claim)

6) Usage Frequency (Departure)

The usage frequency is shown in the heat map. The lighter the color, the more frequently passengers are in the location.

Regarding the Base Case, Figure 3.6-26 shows the usage frequency of the departure area. The map shows that the traffic line to Immigration Entrance 03 and the area between Row D and Row E are frequently used, which could also be considered as a congested area. For the security area, the concourse was in red since the waiting queue is formed on the concourse.



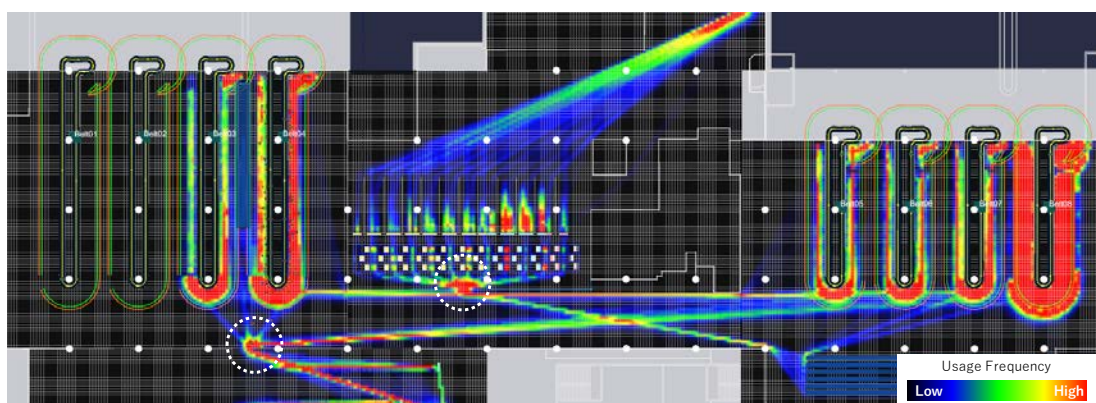
Source: JICA Study Team

Figure 3.6-26 Departure Usage Frequency of Base Case

7) Usage Frequency (Arrival)

The usage frequency is shown in the heat map. The lighter the color, the more frequently passengers are using the location.

Regarding the Base Case, Figure 3.6-27 shows the usage frequency of the baggage claim area. The figure shows that there is plenty of space since the only areas in red were around the baggage claim areas. Other than that, the exit of arrival immigration area and the entrance of the custom area were frequently used.



Source: JICA Study Team

Figure 3.6-27 Arrival Usage Frequency of Base Case

(2) Case 2 (Load Factor 90%)

In Case 2, the factor was raised up to 90% from 60% (Base Case) by estimating the annual peak day and holiday. This case was analyzed on the premise that Immigration Entrance 02 was open since the departure area is seriously congested by raising the load factor to 90%.

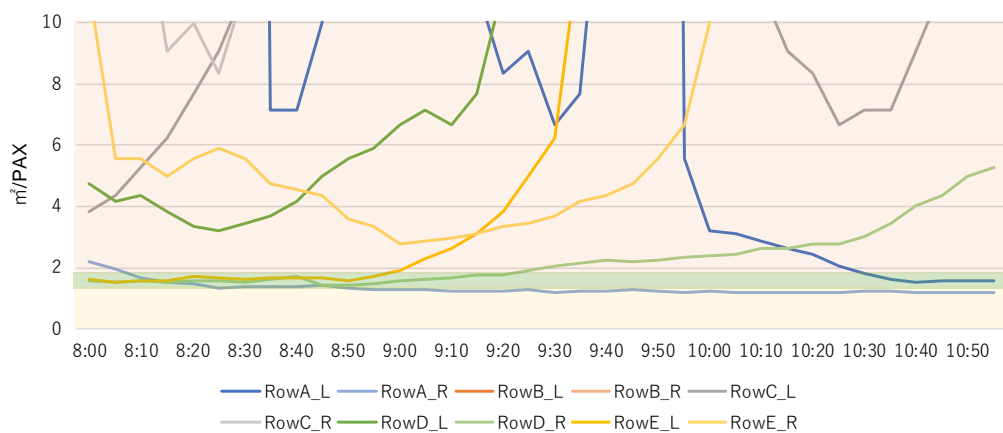
1) Space LoS (Departure)

Regarding the scope of the Space LoS, the area allocated for each passenger (m²/pax) was arranged in chronological order. It shows that the smaller the number, the higher the passenger density will be.

a) Check-in Counter

Regarding Case 2, Figure 3.6-28 shows that the Space LoS of the check-in counter area could be evaluated between the Over-Design range and the Optimum range. Comparing with the Base Case, there are more rows that are closer to the Optimum range. The congested time of Row A-R and Row D-R would extend from before 8:00 to after 10:00.

Even though the load factor is raised to 90%, most of the rows did not reach the Sub-Optimum range. The cause of this phenomenon is that the waiting queue for all the counters form a single queue which results to a dead space.

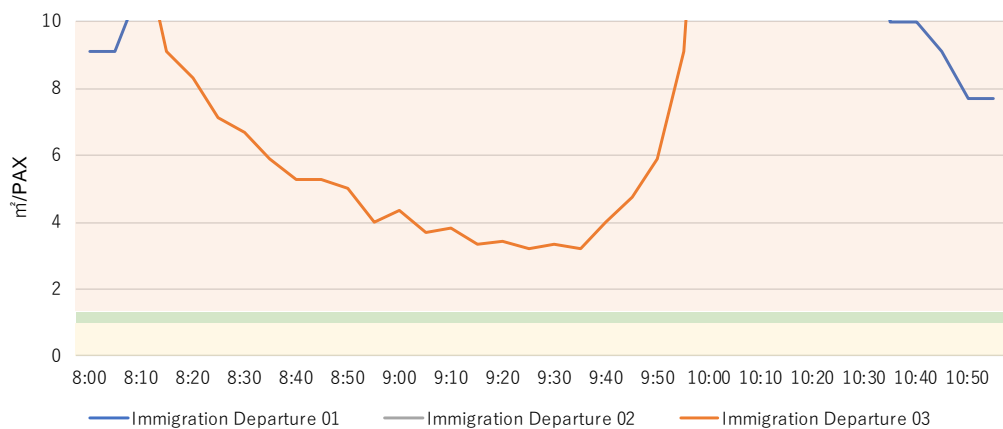


Source: JICA Study Team

Figure 3.6-28 Case 2 Space LoS (Check-in Counter)

b) Departure Immigration

Regarding Case 2, Figure 3.6-29 shows that the Space LoS of the departure immigration area could be evaluated in the Over-Design range for all the entrances. Comparing with the Base Case, the LoS is much better since Immigration Entrance 02 has been opened and the passengers are distributed to three entrances.

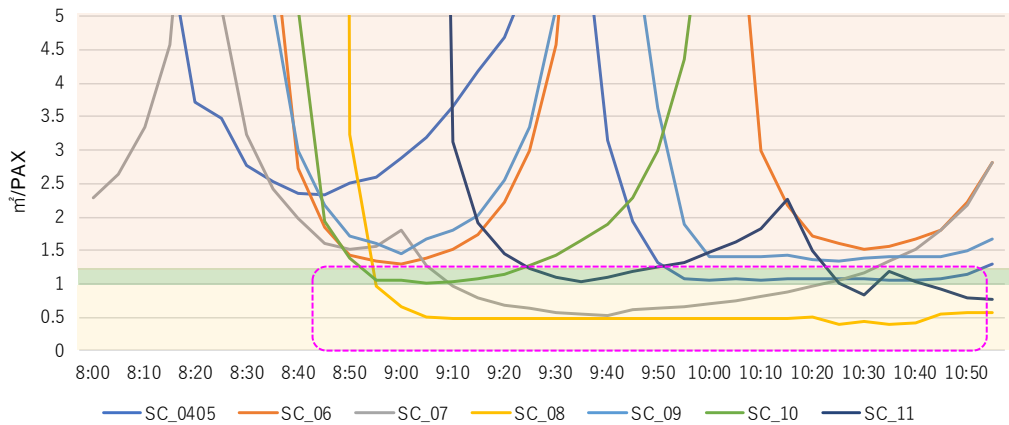


Source: JICA Study Team

Figure 3.6-29 Case 2 Space LoS (Departure Immigration)

c) Security Control

Regarding Case 2, Figure 3.6-30 shows the Space LoS of the security control area. More than half of the security control area could be evaluated between the Optimum range and the Sub-Optimum range. This occurs especially when the LoS worsens starting from 8:30 such that after 9:00, the congestion was so crowded that it stayed in the Sub-Optimum range for more than an hour.



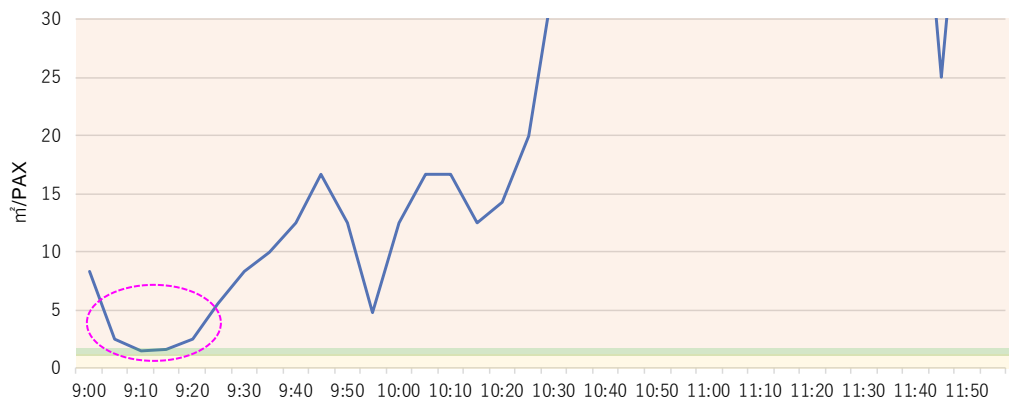
Source: JICA Study Team

Figure 3.6-30 Case 2 Space LoS (Security Control)

2) Space LoS (Arrival)

a) Departure Immigration

Regarding Case 2, Figure 3.6-31 shows the Space LoS of the arrival immigration area. The congestion gets more crowded between 9:00 to 9:30 such that the LoS reaches the Optimum range temporarily. This congestion occurred since there are lots of aircrafts landing at HSIA before 9:00. The congestion situation is not so bad since most of the time, the LoS is in the Over-Design range even though the load factor is 90%. This might be because the processing time of the counters for Bangladesh passport holders is so short that passengers do not have to wait for a long time.



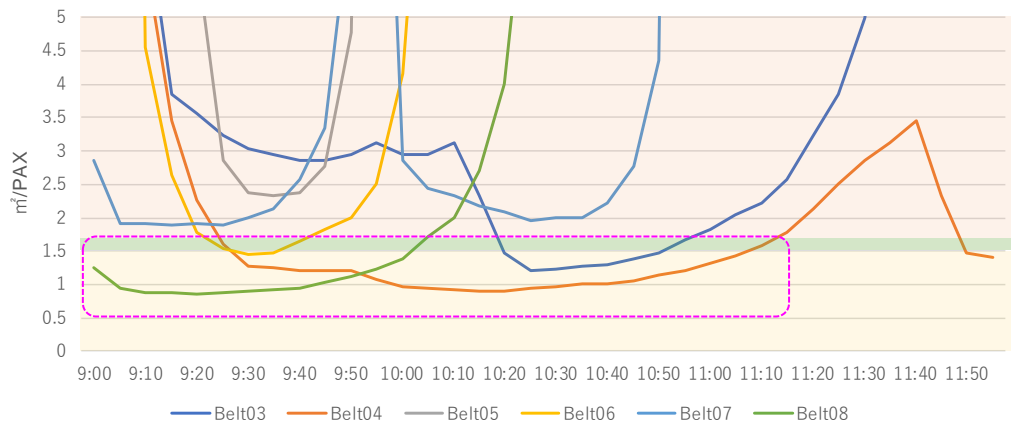
Source: JICA Study Team

Figure 3.6-31 Case 2 Space LoS (Arrival Immigration)

b) Baggage Claim

Regarding Case 2, Figure 3.6-28 shows the Space LoS of the baggage claim area. More than half of the baggage claim area was so crowded that the LoS was between the Optimum range and the Sub-Optimum range. Especially for Belt 04, which was assigned to Biman Airlines, and Belt 08,

which was assigned to the Emirates flight that carried a large number of passengers and baggage, the LoS values were in the Sub-Optimum range for more than an hour.



Source: JICA Study Team

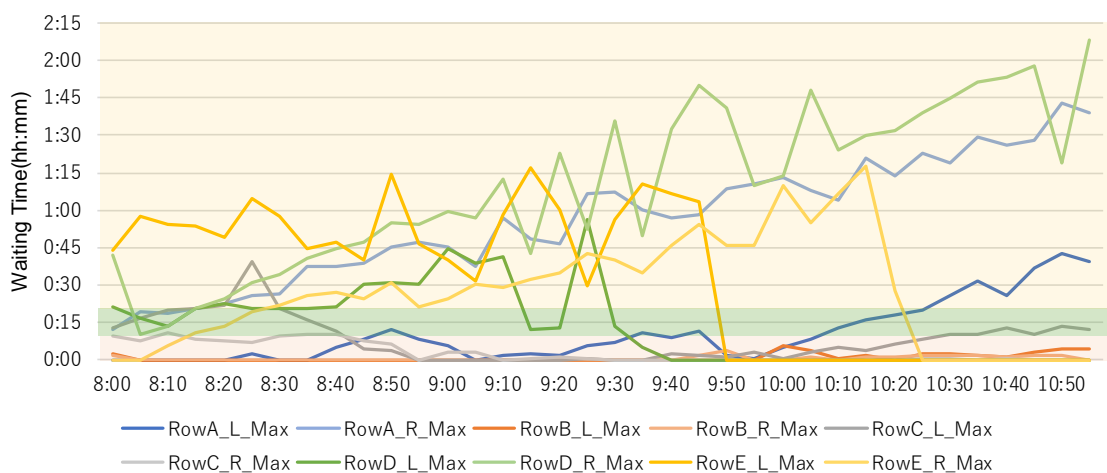
Figure 3.6-32 Case 2 Space LoS (Baggage Claim)

3) Maximum Waiting Time (Departure)

Waiting time is defined as the total time from when the passenger shows up at the end of the waiting queue from the process, to the time when the process is finished. The longest waiting time in every 5-minute interval was arranged in chronological order.

a) Check-in Counter

Regarding Case 2, Figure 3.6-33 shows that the Maximum Waiting Time LoS of the check-in counter area could be evaluated between the Optimum range and the Sub-Optimum range. More than half of the baggage claim area was so crowded that the LoS was in between the Optimum range and the Sub-Optimum range. Especially for Row D, the row which Biman Airline is mainly assigned to, and Row E, the row which Qatar Airways' large aircraft such as the flights to London is assigned to, the waiting time is relatively long compared with other rows.

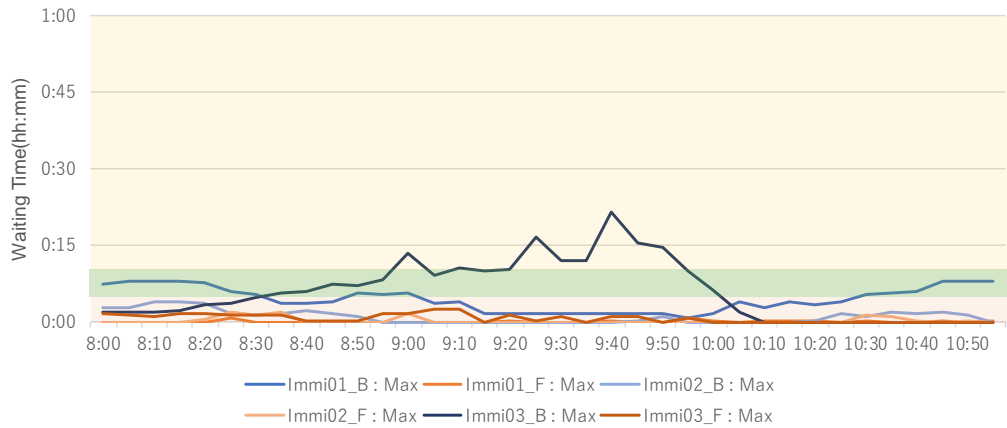


Source: JICA Study Team

Figure 3.6-33 Case 2 Maximum Waiting Time LoS (Check-in Counter)

b) Departure Immigration

Regarding Case 2, Figure 3.6-34 shows the Maximum Waiting Time LoS of the departure immigration area. The counters for Bangladesh passport holders get crowded from 8:00 to 10:00 such that the LoS reaches the Sub-Optimum range. Comparing with Case 1 (Base Case), the LoS is better overall since Immigration Entrance 02 is operating.

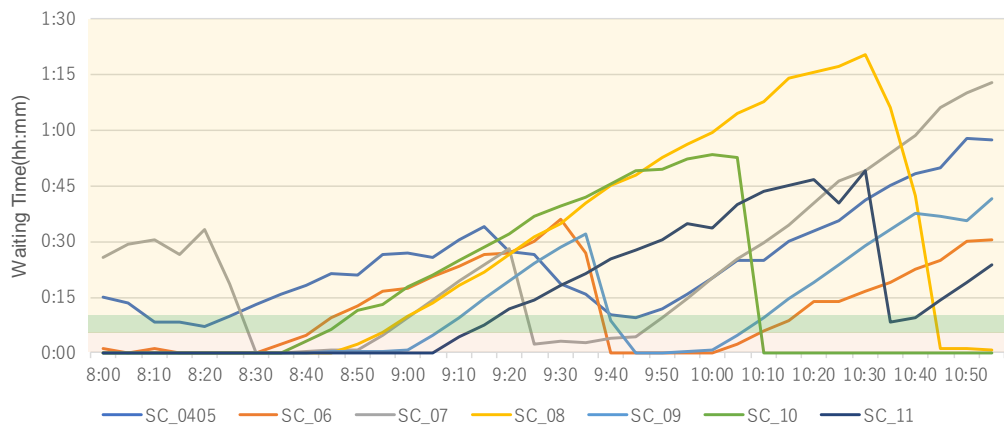


Source: JICA Study Team

Figure 3.6-34 Case 2 Maximum Waiting Time LoS (Departure Immigration)

c) Security Control

Regarding Case 2, Figure 3.6-35 shows that the Maximum Waiting Time LoS of the security control area reaches the Sub-Optimum range. Comparing with Case 1 (Base Case), the maximum waiting time of security controls became around one hour and a half to two hours during peak hours.



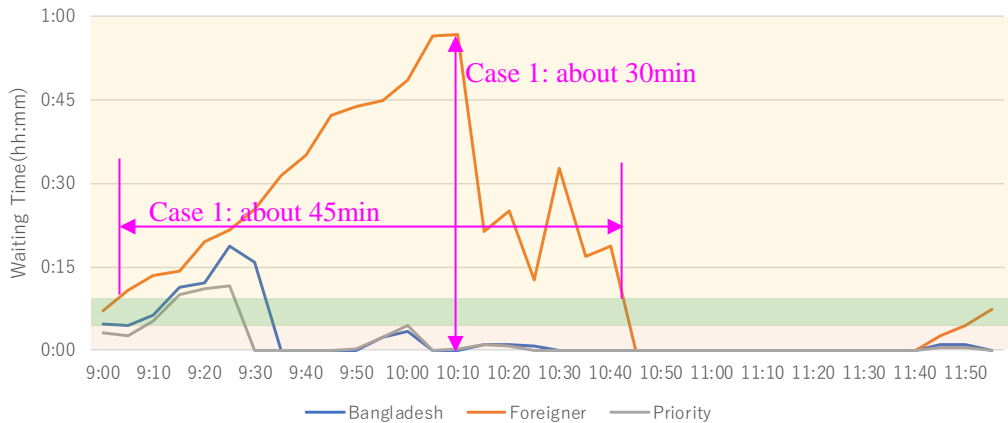
Source: JICA Study Team

Figure 3.6-35 Case 2 Maximum Waiting Time LoS (Security Control)

4) Maximum Waiting Time (Arrival)

a) Arrival Immigration

Regarding Case 2, Figure 3.6-36 shows the Maximum Waiting Time LoS of the arrival immigration area. The counters for Bangladesh passport holders get crowded from 9:00 to 10:40 such that the LoS reaches the Sub-Optimum range. Comparing with Case 1 (Base Case), the maximum waiting time and duration in peak hours became twice longer.

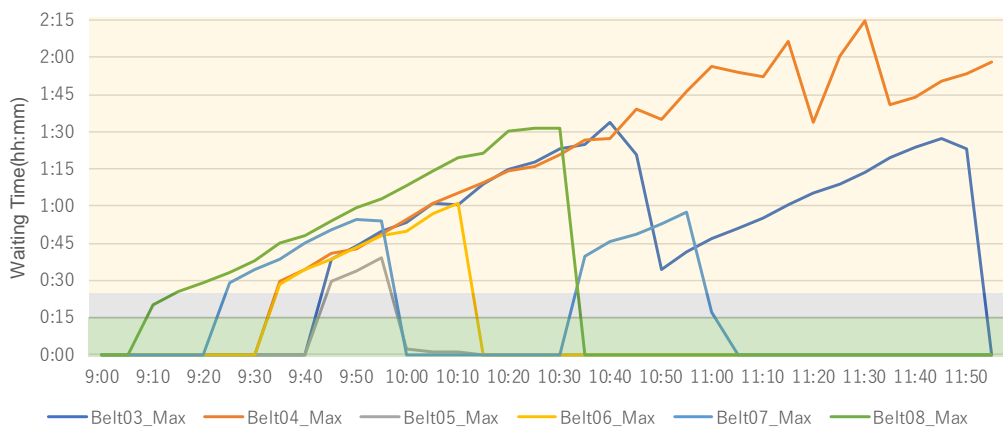


Source: JICA Study Team

Figure 3.6-36 Case 2 Maximum Waiting Time LoS (Arrival Immigration)

b) Baggage Claim

Regarding Case 2, Figure 3.6-37 shows that the maximum waiting time LoS of the baggage claim area could be evaluated in the Sub-Optimum range. The delivery time of the last baggage took a longer time than before by raising the load factor to 90%.

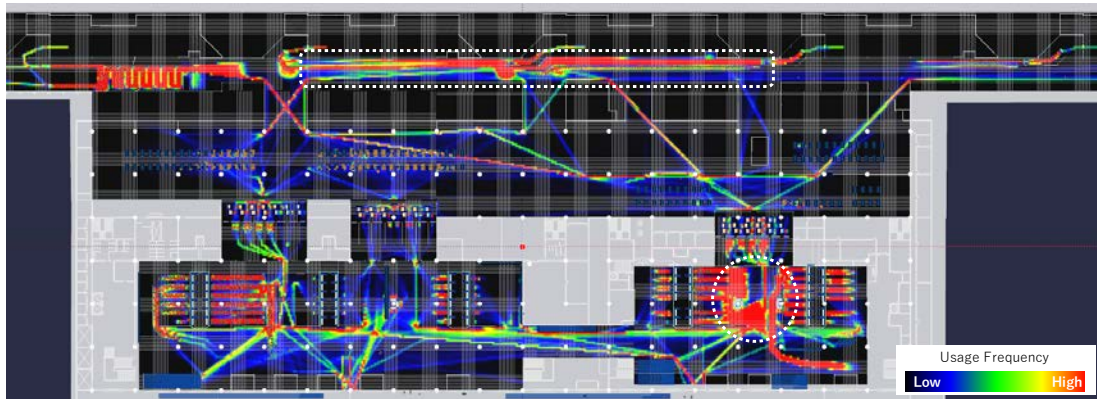


Source: JICA Study Team

Figure 3.6-37 Case 2 Maximum Waiting Time LoS (Baggage Claim)

5) Usage Frequency (Departure)

Regarding Case 2, Figure 3.6-38 shows the usage frequency of the departure area. The crowded area between Row D and Row E have expanded compared with Case 01 (Base Case.) This phenomenon could be seen in the security area. On the other hand, the usage frequency of Immigration Entrance 01 was less compared with Case 01 since Immigration Entrance 02 is operating in Case 02.

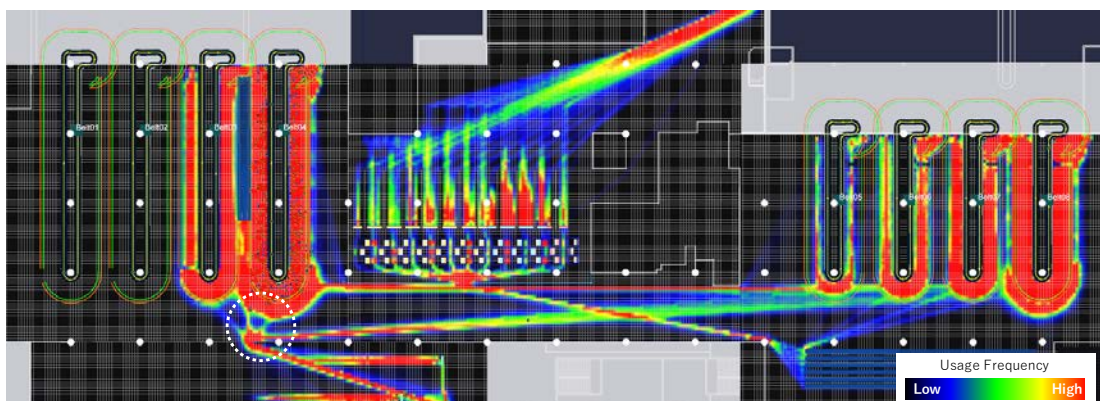


Source: JICA Study Team

Figure 3.6-38 Case 2 Usage Frequency (Departure)

6) Usage Frequency (Arrival)

Regarding Case 2, Figure 3.6-39 shows the usage frequency of the arrival area. Except for the vicinity of the baggage claim area, the usage frequency is high compared with Case 01 (Base Case), especially because the crowd around Belt 04 and the entrance of custom area became more crowded. From this figure, it could be estimated that when the load factor becomes higher, the crowded area would expand.



Source: JICA Study Team

Figure 3.6-39 Case 2 Usage Frequency (Arrival)

(3) Case 3 (Load Factor 90% + Imaginary Flight)

In Case 3, imaginary flights were inserted in the common open space of the baggage claim assignment table, the check-in counter assignment table, and the date assignment table to assume the increasing number of flights at HSIA. Also, the load factor was set to 90%. There were three imaginary flights each for departure and arrival considering the turnaround.

1) Premise for Imaginary Flight

a) Aircraft Condition

Regarding the aircraft type for the imaginary flights, Boeing 737-800 (738) (number of seats: 162) was used since it is an aircraft type that Bangladeshi airlines frequently used.

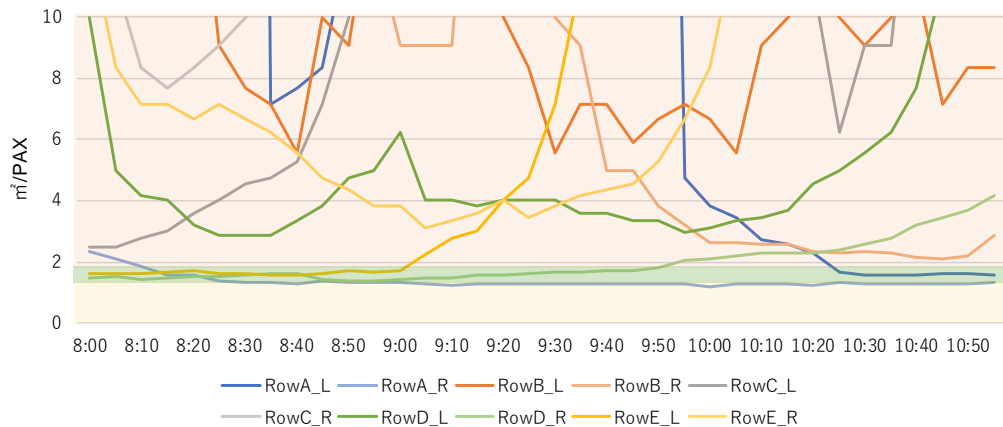
2) Space LoS (Departure)

Regarding the scope of Space LoS, the area allocated for each passenger (m²/pax) was arranged in chronological order. It shows that as the number gets smaller, the higher the passenger density will be.

*Regarding security control, the imaginary flights TRY002 and TRY003 were not included in the security control analysis since they were not in the target analysis time zone.

a) Check-in Counter

Regarding Case 3, Figure 3.6-40 shows the Space LoS of the check-in counter area. Even though the worsening of LoS is more evident compared with Case 01 (Base Case) by including an imaginary flight to Row B-L, Row R, and Row D-L, most of the rows were still in the Over-Design range. Therefore, it could be estimated that the effect of including three imaginary flights is not so significant.

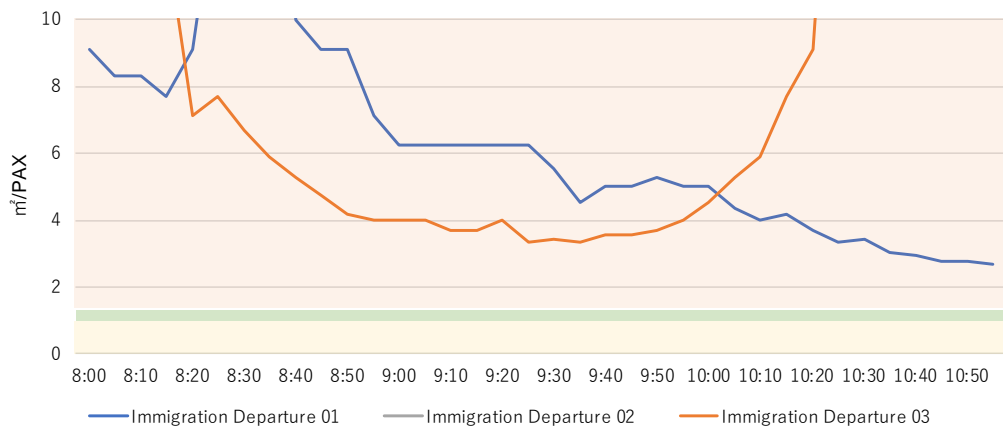


Source: JICA Study Team

Figure 3.6-40 Case 3 Space LoS (Check-in Counter)

b) Departure Immigration

Regarding Case 3, Figure 3.6-41 shows the Space LoS of the departure immigration area. The LoS of Immigration Entrances 01 and 03 became lower than Case 01 (Base Case) since the imaginary flights were included. However, their LoS values were still in the Over-Design range. The LoS had worsened for Immigration Entrance 01 since Row A had a foreign airline assignment and Row B had an imaginary flight assignment at the same time.



Source: JICA Study Team

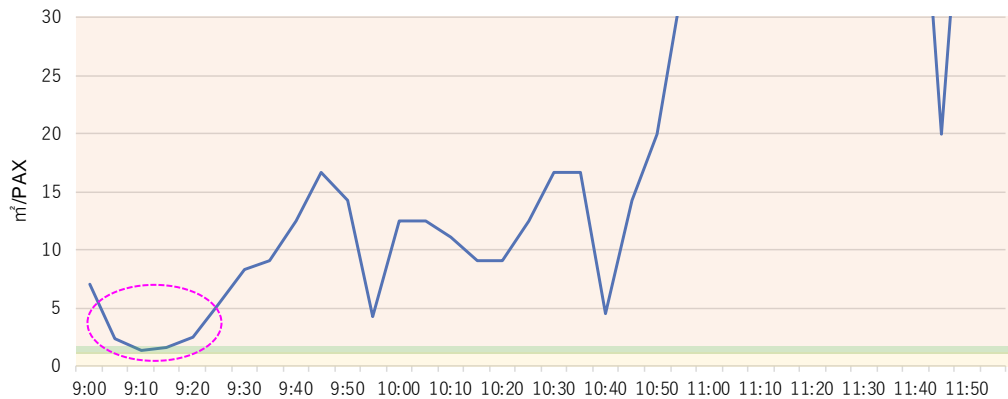
Figure 3.6-41 Case 3 Space LoS (Departure Immigration)

3) Space LoS (Arrival)

Regarding the scope of Space LoS, the area allocated for each passenger (m²/pax) was arranged in chronological order. It shows that as the number gets smaller, the higher the passenger density will be.

a) Arrival Immigration

Regarding Case 3, Figure 3.6-42 shows the Space LoS of the arrival immigration area. The LoS between 10:00 to 10:30 became lower than in Case 01 (Base Case) since the imaginary flights were included. However, it could be estimated that there is still plenty of space overall since the LoS was in the Over-Design range most of the time.

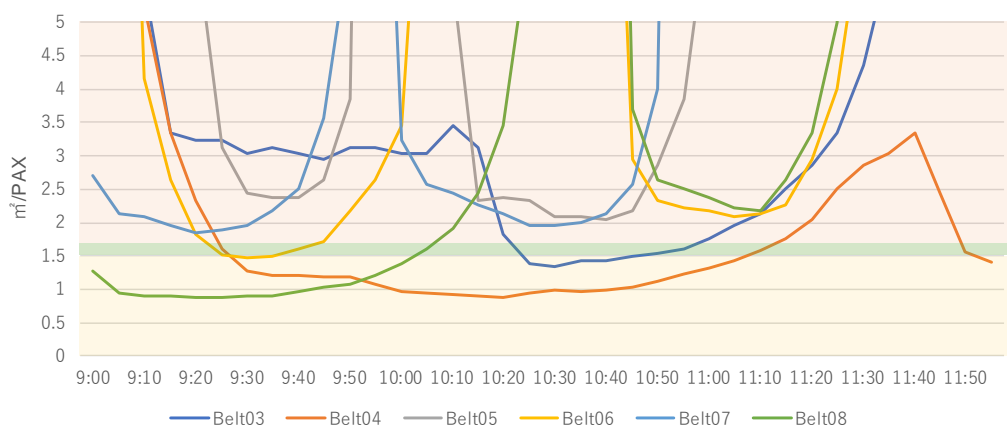


Source: JICA Study Team

Figure 3.6-42 Case 3 Space LoS (Arrival Immigration)

b) Baggage Claim

Regarding Case 3, Figure 3.6-43 shows the Space LoS of the baggage claim area. The LoS of Belts 05, 06, and 08 became lower than in Case 01 (Base Case) between 10:00 to 10:30. However, it could be estimated that there is still plenty of space overall since the LoS values were in the Over-Design range most of the time. The LoS might be in the Sub-Optimum range if the imaginary flight used a larger aircraft than Boeing 737-800 (738) (number of seats: 162) or if the load factor was higher than 90%.



Source: JICA Study Team

Figure 3.6-43 Case 3 Space LoS (Baggage Claim)

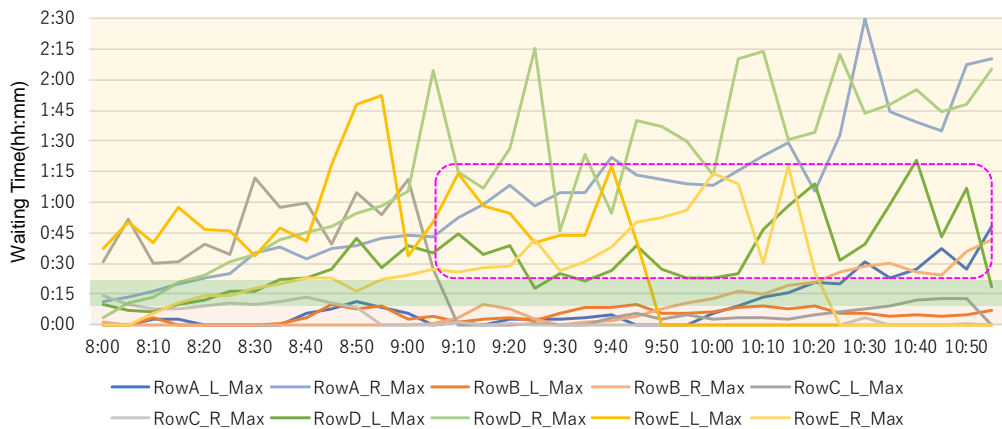
4) Maximum Waiting Time (Departure)

Waiting time is defined as the total time from when the passenger shows up at the end of the waiting queue from the process, to the time when the process is finished. The longest waiting time in every 5-minute interval was arranged in chronological order.

*Regarding security control, the imaginary flights TRY002 and TRY003 were not included in the security control analysis since they were not in the targeted time zone.

a) Check-in Counter

Regarding Case 3, Figure 3.6-44 shows the Maximum Waiting Time LoS of the check-in counter area. The LoS of Row B-L and R have worsened since the imaginary flight was assigned in those rows. Also, the LoS of Row D-L went to the Sub-Optimum range after 9:00.

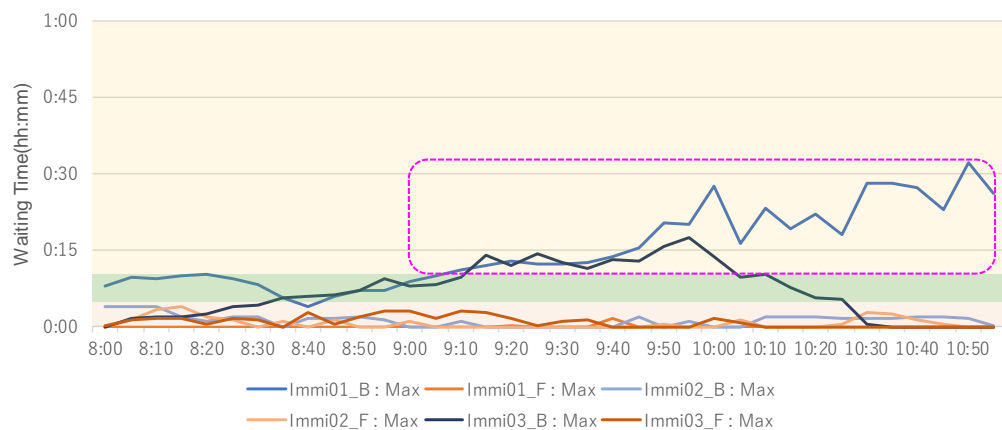


Source: JICA Study Team

Figure 3.6-44 Case 3 Maximum Waiting Time LoS (Check-in Counter)

b) Departure Immigration

Regarding Case 3, Figure 3.6-45 shows the Maximum Waiting Time LoS of the departure immigration area. The LoS of Immigration Entrances 01 and 03 have worsened to the Sub-Optimum range from 9:00 when the imaginary flight was assigned.



Source: JICA Study Team

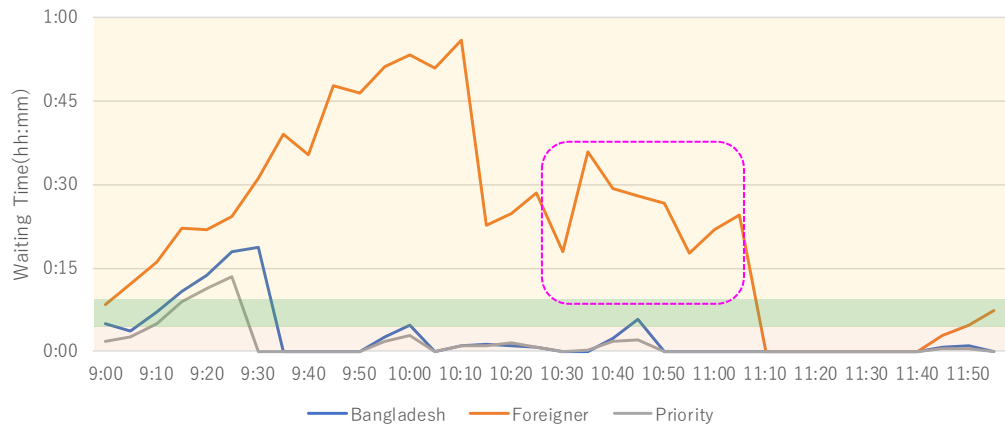
Figure 3.6-45 Case 3 Maximum Waiting Time (Departure Immigration)

5) Maximum Waiting Time (Arrival)

Waiting time is defined as the total time from when the passenger shows up at the end of the waiting queue for the process, to the time when the process is finished. The longest waiting time in every 5-minute interval was arranged in chronological order.

a) Arrival Immigration

Regarding Case 3, Figure 3.6-46 shows the Maximum Waiting Time LoS of the arrival immigration area. The LoS of the counter for Bangladesh passport holders was in the Sub-Optimum range even between 10:30 to 11:00 since the imaginary flights are arriving around 10:00.

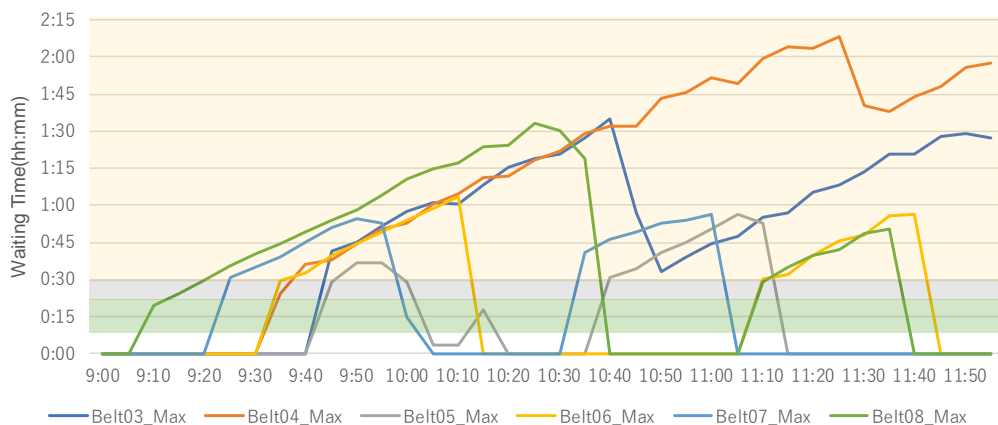


Source: JICA Study Team

Figure 3.6-46 Case 3 Maximum Waiting Time LoS (Arrival Immigration)

b) Baggage Claim

Regarding Case 3, Figure 3.6-47 shows the Maximum Waiting Time LoS of the baggage claim area. In the time zone where the imaginary flights are assigned, the area became so crowded that the LoS was in the Sub-Optimum range. However, there is still plenty of space to assign flights since there is a low possibility that baggage from multiple flights will go to the same baggage claim area.

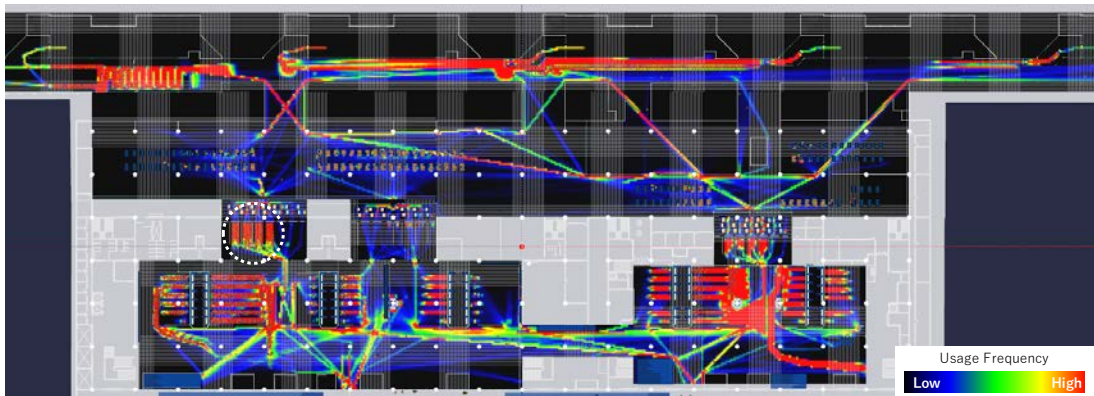


Source: JICA Study Team

Figure 3.6-47 Case 3 Maximum Waiting Time LoS (Baggage Claim)

6) Usage Frequency (Departure)

Regarding Case 3, Figure 3.6-48 shows the usage frequency of the departure area, wherein the frequency of Immigration Entrance 01 was compared with that in Case 02.

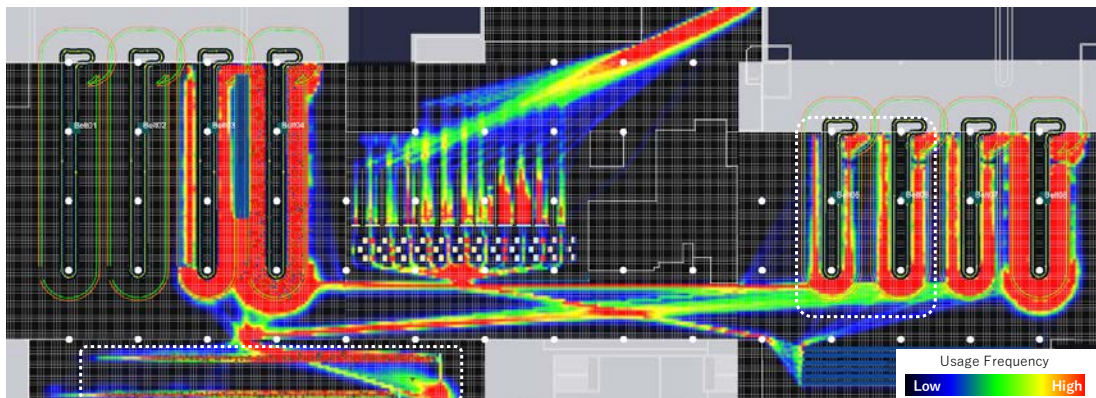


Source: JICA Study Team

Figure 3.6-48 Case 3 Usage Frequency (Departure)

7) Usage Frequency (Arrival)

Regarding Case 3, Figure 3.6-49 shows the usage frequency of the arrival area. The usage frequency of Belts 05 and 06 became higher compared with that in Case 02. Also, the usage frequency of security control became higher since the imaginary flights were assigned.



Source: JICA Study Team

Figure 3.6-49 Case 3 Usage Frequency (Arrival)

3.6.4 Issues to be Solved

(1) Flight Assignment (Departure)

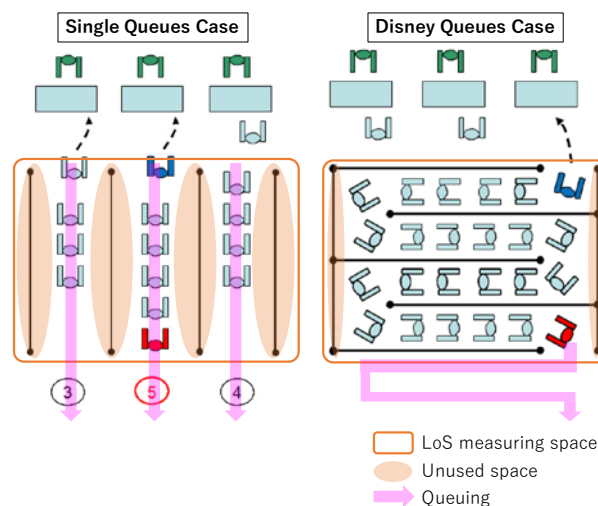
- 1) In this airport, congestion and delays occur in each procedure due to the fluctuation of the assignment time of check-in counters and security controls for each flight.
 - a) At the check-in counter, duplicated assignments for different flights are regularly executed. When different flight assignments are duplicated at the same check-in counter, it is confirmed that LoS may eventually deteriorate when passengers show up all at once, beyond the processing capacity.
 - b) In security control, it is difficult to assign consistent and adequate times for each flight. It is confirmed that delay for some flights can occur due to incomplete passenger security control before the scheduled departure time.

(2) Flight Assignment (Arrival)

- 1) Currently, there are plenty of flight numbers that can be assigned, so it is unlikely that issues such as duplication of arrival flights at the same baggage carousel belt will occur. However, if the arrival of large aircrafts such as Boeing 777-300ER overlaps, the process time from the arrival of the first bag until the arrival of the last bag will be prolonged, and the assignment may overlap. When the load factor becomes higher and depending on the type of aircraft of arrival flight, it may be necessary to consider the assignment including the use of Belt 01 and Belt 02.

(3) LoS (Space/Maximum Waiting Time) (Departure)

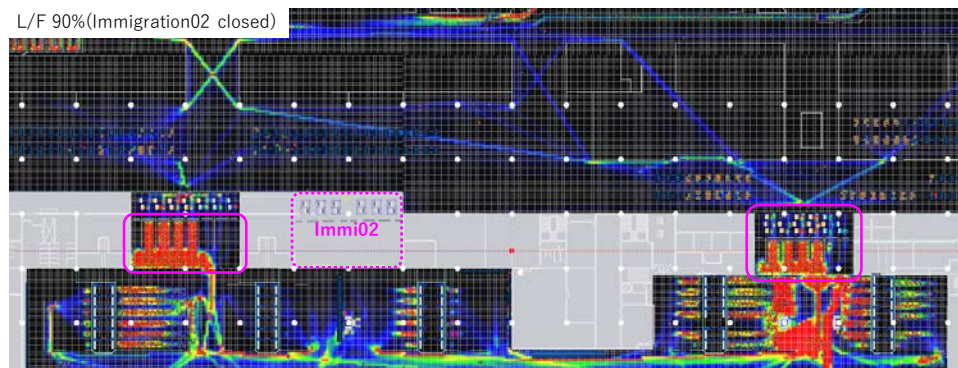
- 1) Regarding check-in counters, the Maximum Waiting Time LoS worsens because the waiting queue is longer as a result of the increase of the load factor. Regarding the scope of Space LoS, there was not much of a difference even when the load factor increased. The waiting queue for the check-in counter in HSIA is generally a single queue. The Disney Queue, which is one of the alignments where waiting passengers are assigned to multiple counters from a single queue, will lessen the dead space and will secure at least 1 m² per passenger even when the waiting queue gets longer. This is unlike the single queue that has to squeeze the passengers in the limited space.



Source: ACI WORLD – Recommended Practice 300A12
Manual Measurement of Passenger Service Process Times and KPI'S

Figure 3.6-50 Alignment Method of Check In Counter

- 2) At the Immigration area, the worsening of the Maximum Waiting Time LoS had been confirmed at the counters for Bangladesh passport holders. It was also confirmed that passengers could flow smoother by including the operation of Immigration Entrance 02 when the load factor is 90% congested. When Immigration Entrance 02 was not operated with a load factor of 90%, it was confirmed that the LoS of Immigration Entrances 01 and 03 greatly deteriorated, and the possibility of the occurrence of a bottleneck became higher.

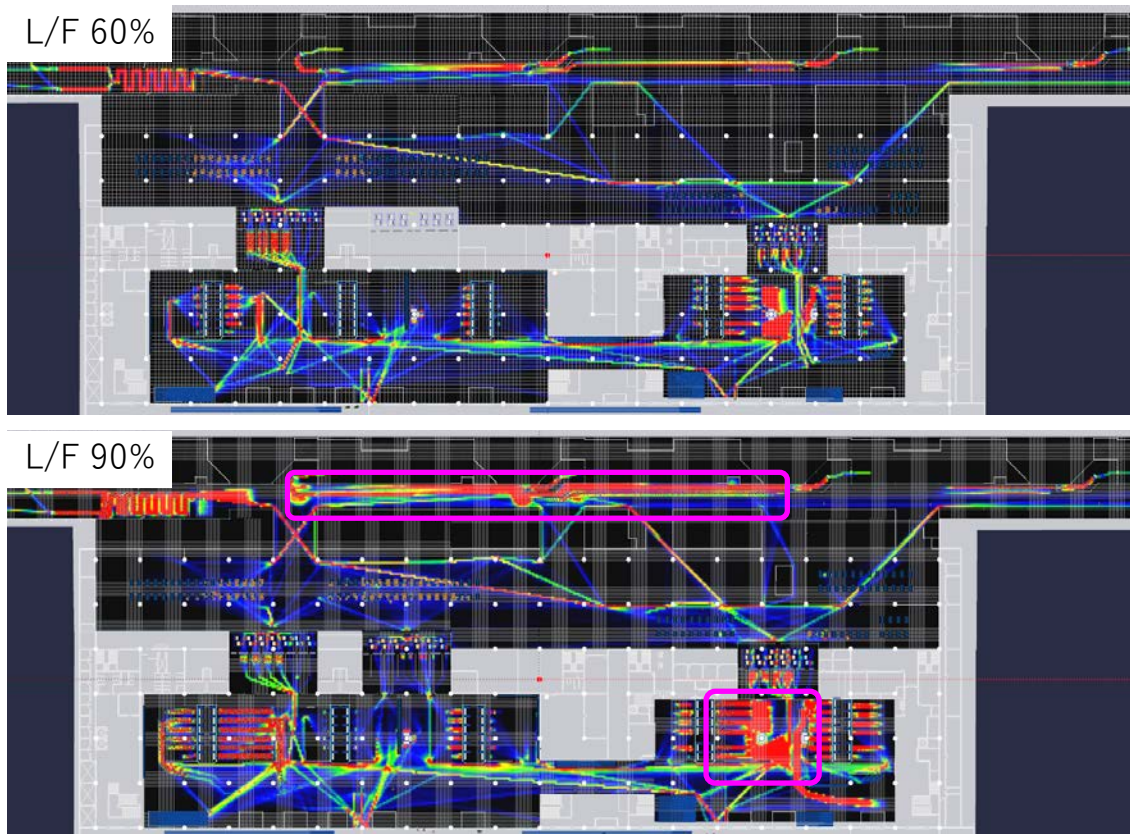


Source: JICA Study Team

Figure 3.6-51 Heat Map (Load Factor 90% not Operating Immigration Entrance 02)

- 3) In security control, both the Space LoS and the Maximum Waiting Time LoS results were unacceptable. The timing of the gate call of this airport tends to be announced immediately before the scheduled departure time, and the passengers show up all at the same time. Additionally, there are no standby spaces provided as buffer around the security control facility. Only one facility exists per gate, and this passenger show-up concentration is likely to deteriorate the LoS.
- (4) LoS (Space/Maximum Waiting Time) (Arrival)
- 1) At the immigration area, the worsening of the Maximum Waiting Time LoS had been seen at the counters for foreigners. Congestion is likely to occur since the process time of arrival is nearly four times higher compared with that of the counter for Bangladesh passport holders and because there is only a small number of counters for foreigners.
 - 2) Both the Space LoS and the Maximum Waiting Time LoS results became unacceptable and severe for the baggage claims area. It takes almost 30 minutes for the arrival of the first bag, and 30 to 40 minutes from the arrival of the first bag to the arrival of the last bag. Therefore, in terms of total time, it is difficult to meet the optimum condition of LoS.
- (5) Usage Frequency (Comparison of Load Factor 60% and 90%) (Departure)

When the load factor was increased from 60% to 90%, higher passenger frequency was confirmed between Row D and Row E and in the concourse in front of security control. Both locations intersect with passenger flow lines which are likely to be the factors causing congestion.

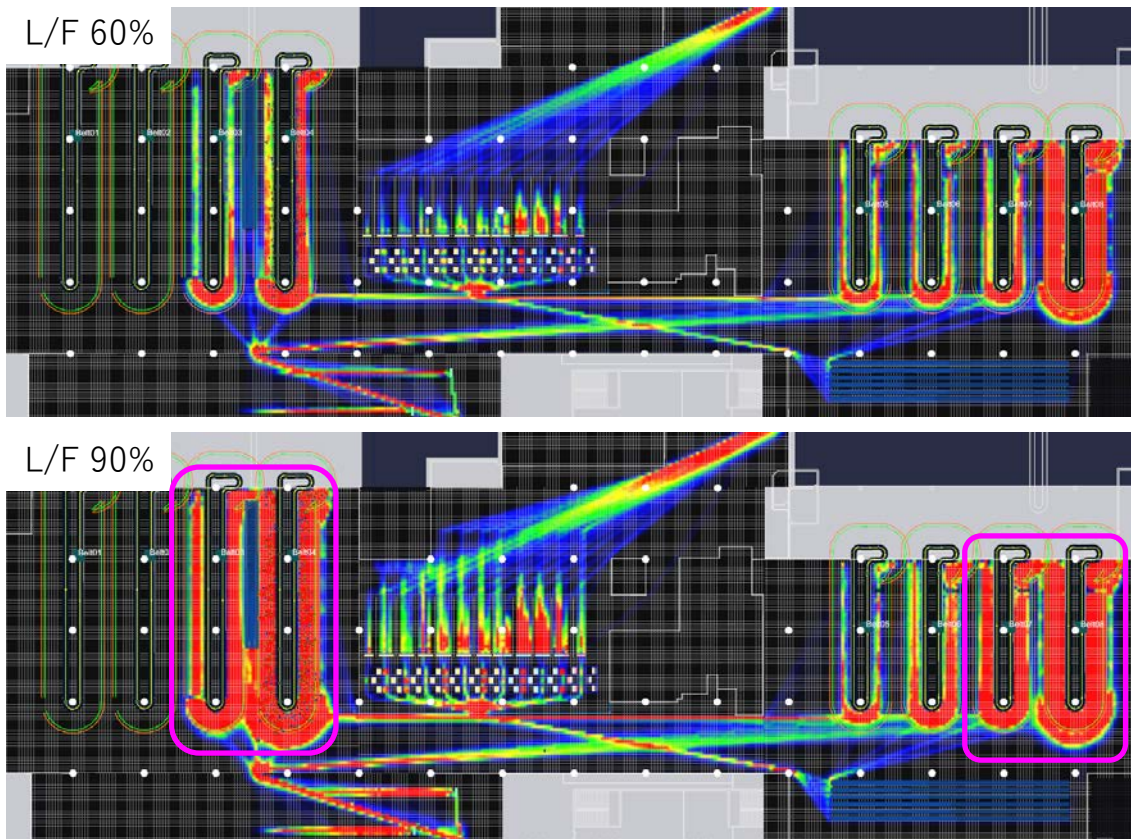


Source: JICA Study Team

Figure 3.6-52 Comparison of Load Factor 60% and 90% (Departure)

(6) Usage Frequency (Comparison of Load Factor 60% and 90%) (Arrival)

When the load factor was increased from 60% to 90%, an increase in passenger passage frequency around the baggage claim area had been confirmed. At the baggage claims area adjacent to Belt 03, Belt 04, Belt 07, and Belt 08, it is considered that the congestion range overlaps and there is a high possibility that congestion deterioration will occur in passenger flow.



Source: JICA Study Team

Figure 3.6-53 Comparison of Load Factor 60% and 90% (Arrival)

3.6.5 Improvement Plan

The guidelines for improving the LoS were organized as follows. In addition, the tendency of the LoS of each of the processing facilities at the HSIA (in the case of load factor of 90%) was sorted as shown in Figure 3.6-54 and Figure 3.6-55 based on the LoS chart. (*reference). When comparing the LoS of the load factor of 60% and 90%, the deterioration of the baggage inspection and the baggage claim was confirmed in the Space LoS, and the check-in counter and the immigration procedure deteriorated in the Maximum Waiting Time LoS. When LoS is evaluated on two axes, it turns out that there is a possibility that LoS may deteriorate more than the Sub-Optimum range in all but departure procedures.

L/F 60% Case	Space	Max Waiting Time	LoS Total
Check-in Counter	OVER-DESIGN	OVER-DESIGN	OVER-DESIGN
Immigration(Dep)	OVER-DESIGN	Optimum	Optimum
Security Control	OVER-DESIGN	SUB-Optimum	SUB-Optimum
Immigration(Arr)	OVER-DESIGN	Optimum	Optimum
Baggage Reclaim	OVER-DESIGN	SUB-Optimum	SUB-Optimum

Source: JICA Study Team

Figure 3.6-54 LoS Trend of Processing Facilities (Load Factor 60%)

L/F 90% Case	Space	Max Waiting Time	LoS Total
Check-in Counter	OVER-DESIGN	SUB-Optimum	SUB-Optimum
Immigration(Dep)	OVER-DESIGN	Optimum	Optimum
Security Control	SUB-Optimum	SUB-Optimum	UNDER-PROVIDED
Immigration(Arr)	OVER-DESIGN	SUB-Optimum	SUB-Optimum
Baggage Reclaim	SUB-Optimum	SUB-Optimum	UNDER-PROVIDED

Source: JICA Study Team

Figure 3.6-55 LoS Trend of Processing Facilities (Load Factor 90%)

(1) Creating the Flight Assignment Table

Create the Flight Assignment Table Rule as the basis for the creation of the Flight Assignment Table for each season, both for the check-in counter and the security gate. Perform operations so as to avoid passenger show-up overlaps or concentration immediately before the flight.

(2) Improving the Check-in Process

At the check-in counter, changing the queue from a single queue to a snake queue and reducing the dead space are some of the effective methods for optimizing LoS.

In addition, the administrator side of the check-in area should clarify and present the area for locating the queue of each row. Each airline should operate with the goal of satisfying this rule, which is confirmed effective for controlling congestion in the airport. In addition, evaluating LoS based on this rule is also considered effective for improving the operation of each airline.

* At international airports in Japan, rules are presented to each airline to operate within 6 m from the check-in counter.

Regarding the processing time, about three and a half minutes for Bangladeshi airlines and about three minutes for the foreign airlines are confirmed as one of the causes of the deterioration of LoS. Therefore, improvement is considered necessary.

* At international airports in Japan, the average is around 1 minute 40 seconds.

(3) Effective Operation of Immigration Area

The operation of Immigration Entrance 02 is currently conducted at the time of congestion in the departure immigration. However, knowing the tendency of conduct timing for effective use of Immigration Entrance 02 shall be analyzed based on the load factor percentage study analyzed from the passenger flow to avoid the bottleneck in immigration and to improve the LoS.

(4) Shortening the Conveying Time of the Baggage from the Aircraft.

In the baggage claim process, it is understood that it is necessary to shorten the time from unpacking the cargo quickly after the arrival of the flight to the transportation of the first bag. It is also necessary to increase the processing capacity of the baggage transportation. At international airports in Japan, the time required for the arrival of last bag from the arrival time of the aircraft is about 25 minutes to 40 minutes.

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Chapter 4 Results of Hearing from Companies

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CHAPTER 4 RESULTS OF HEARING FROM COMPANIES

4.1 Outline

4.1.1 Hearing Subject Companies

The interviewed companies are shown in Table 4.1-1.

Table 4.1-1 Hearing Subject Companies

Japanese	1 Trading Firm
	2 Apparel Company
	3 Forwarders
Local	3 Air Carriers
	1 Forwarder
	1 Courier Company
	1 CNF Agent *
	2 Customs Offices (Head Office, Branch Office)

*CNF Agent: Customs Broker

Source: JICA Study Team

4.1.2 Outline

Outline of results of hearing from companies are shown in Table 4.1-2.

Table 4.1-2 Outline of Hearing

Item	Contents
Findings	<ul style="list-style-type: none"> → Bonded warehouses are narrow (an average of three times wider than the present spaces are necessary both for export and import) → In export warehouse, there is not enough space for unloading cargo, especially, Common area is seriously congested → In import warehouse, cargo which cannot be accommodated in the warehouse is left unattended in the open air from the place under the canopy (non-bonded) near the ramp → Although BIMAN AIRLINES is a monopoly and is favorably treated, this is not well managed in terms of cargo proficiency. → It was told that accidents of a ULD directly hitting an aircraft occurred three times in the past three years due not secured a ULD to other equipments or place a ULD direct on the ground. → The damage compensation is substantially borne by airlines. → The facility for courier cargo is poor → There should be designated storage facilities for cargo which are not unclaimed for a long time should be stored outside of the bonded warehouse to ease up of the congestion. → Unreserved cargo placed in front of the export bonded warehouse should be placed outside of the airport (another idea is to transfer these cargoes to the old bonded warehouse when the new bonded warehouse is completed) → Bonded cargo cannot be stored outside of the airport because the concept of bonded transfer is not established in Dhaka. → There is a shortage on customs officers (one officer processes hundreds of cases per day: in total, there are about 20 officers in export and import each) and the knowledge of Customs officers for HS number is insufficient The substantial office hours of the customs office is less than 6 hours due to late opening and prolonged lunch break, which should be considered to facilitate moving out of cargo from the warehouse

Item	Contents
Agenda	<ul style="list-style-type: none"> → Handling and storage space both in export and import warehouse is too narrow. → Biman staff is not reliable on qualitative and swift handling because they do not do enough basic training including safety management. → The contract of claim of damage and loss between Biman Airlines and other airlines is unilateral for Biman Airlines. → An e-commerce business operator plans to use a courier service; therefore, the facility for courier service is necessary to get future demand for the business and to develop the country through expansion of air trade e-commerce. → The concept of bonded transfer is not established. → There is a shortage on Customs officers (in total, there are about 20 officers in export and import each). → The knowledge of Customs officers for HS code is insufficient. → The substantial office hours of the Customs office are less than 6 hours.

Source: JICA Study Team

4.2 Hearing of Opinion on the Current Situation

(1) Interviewee: Civil Aviation Security Officer

Hearing on ideas how to check time for JICA survey.

- Regarding the Counting of Waiting Time for Export Trucks
Major forwarders (e.g. Agility and EFL) save on waiting time by obtaining a gate pass in advance, so that their trucks can directly access the specific areas of the bonded warehouse, unload cargo, and scan them (piece by piece). On the other hand, small and medium sized forwarders are forced to wait a long time, then unload cargo in front of the bonded warehouse where Customs officers check them (i.e. a part of the cargo is inspected). After which they obtain a gate pass and cargo are scanned. The officer said that the waiting time would sometimes considerably long.
- Regarding ULD Build Up (B/U) Order
The officer advised us to ask airlines on this matter since ULD B/U order would be informed from an airline to the staff of that airline.
- Regarding Loading Instruction (L/I)
The officer advised us to ask airlines on this matter since L/I would be informed from an airline to the load supervisor of that airline.
- Regarding Customs Declaration
Customs officers are always station in front of the export bonded warehouse as mentioned above. They check the content and inspect a part of the cargo (export customs declaration procedure is completed here).
- Regarding IT System
The interviewee said that a lot, but not all, of airline systems including that of Biman Airlines used SPOT, which was a software application of the Champ system. The interviewee also said that this application took in reservation information (to be entered by airline), ULD information, and even freight traffic of actual cargo data of airline and would prepare W/B (Weight and Balance) based on this information.
- Customs System
The interviewee said that HSIA Customs used Asycuda, which was developed by the United Nations Conference on Trade and Development (UNCTAD), introduced by the customs of more than 50 countries in the world, was linked with the Import General Manifest (IGM) sent from airlines using passwords allocated for each airline. The interviewee also said that manifest information, such as the number of pieces and the name of commodity of cargo, were contained in this IGM using the AWB number as a key and that Customs clearance information would be indicated additionally in this IGM.

- Regarding Actual Time of Arrival (ATA) and Carrying-in of Cargo
The JICA Study Team was previously advised that they had no other alternative but to call and ask airlines for ATAs. However, subsequent information from the Passenger and Ramp Group suggested that all daily ATAs, including those of cargo flights can be obtained from the SATO by inquiring through e-mail. The JICA Study Team is advised that valuables, fresh products, and the like are stored in dedicated storage facilities. Storage facilities are supposedly designated in advance.
- Regarding Carrying-out of Import Cargo
The JICA Survey Team was that it would be appropriate to find cargo being taken out from a bonded warehouse and to ask the airline in question or Biman Airlines Cargo about the date of carrying-in of cargo under the AWB to the import bonded warehouse.
- Regarding Carrying-in of Export Cargo by Trucks
The JICA Survey Team was advised that cargo is reserved, in principle, on or before the previous day of departure and is carried-in to the bonded warehouse no later than 2-4 hours prior to the flight.
- Regarding Counting of Time Required for B/U Works of Export Cargo
The JICA Survey Team was advised that it would be realistic to find a ULD which is going to be built-up in the bonded warehouse and to count the time taken until the completion of B/U works.
- Regarding Counting of Time Required for Loading of Export Cargo
The JICA Survey Team was advised that it would be appropriate to ask airlines about the time of issuance of L/I (Loading Instruction) and the time of completion of loading of the flight (by SPOT system).
- Regarding Import Customs Clearance
When a customs officer issues an Authorization Letter to the AWB in question based on the IGM data mentioned above, the customs Clearance is completed. The JICA Survey Team was advised that there is no other alternative but to ask the Customs for details. Biman Airlines Import Cargo division may have information on this matter.

(2) Interviewee: Person of Airline in Charge of Cargo

In connection with the survey, advised that L/I (Loading Instruction), common to all airlines, should be submitted to Biman Airlines 1 h 45 min prior to departure for passenger flights. Biman Airlines prepares W/B and informs the loading supervisor. In the case of a freighter, an airline's own load master prepares it 3.5 h (for upper deck) or 2 h (for lower deck) prior to flight departure and informs the loading supervisor. In order to count this time, substantial work load will arise in which it has to be explained, informed, and obtained data from the person-in-charge of respective carriers. It is not guaranteed that accurate data can be obtained reliably. Therefore, the abovementioned measures were applied. The JICA Survey Team was advised that he would answer only at the time when cargo loading is complete and other airlines would answer in the same manner.

(3) Interviewee: Japanese Forwarder (Registered Customs Specialist)

Problems in the Present Situation.

1) Export

- The bonded warehouse is too small, particularly the Common area (i.e., the area other than RA3).
- The number of pieces of bulk cargo carried in to the warehouse is not counted.
- Racks in the RA3 area are not utilized at all but for skids to store.
- Biman Airlines staff pretends to take action, but they do nothing. They are lack in training and never attend to matters that they are held responsible for.

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- The wage level of Biman Airlines staff is relatively low. Wages of fabric industry workers in Bangladesh have been raised from Tk8,000 to Tk14,000 /month (about JPY 18,000) recently.
- 2) Import
- Import is the most challenging issue.
 - Since there are cases in which a large penalty may be imposed on the handling of duty-free items or non-revenue cargo or on the inconsistency in the certificate of origin, concerned persons must prepare the documents carefully and negotiate with the customs, which usually takes a longer time.
 - One revenue officer of Customs handles hundreds of cases of all the CNF agents daily and seems to be uninformed on HS codes. In the Customs office, it appears that more skilled staff are necessary in order for shipment to be handled smoothly.
 - When CNF agents (Customs Broker) submit Customs clearance documents such as Invoice P/L (Packing List), the Customs officer overwrites IGM (manifest data) entered by an airline and the Customs clearance procedures start. The cargo of consignees with strong connections or of banks is cleared quickly and little case for penalty.
 - Office hours of Biman Airlines cargo terminal are from 9:00 a.m. to 5:00 p.m., consistent with the official Customs clearance time.
 - The Japanese forwarder thinks that about 60 m² is occupied by long-term storage cargo and that transferring these cargoes outside of warehouse will ease congestion.
 - The location control assumed to be performed in a certain manner, but it is hard to understand for outsiders.
- 3) Transportation to EPZ (Export Processing Zone)
- It appears that no established concept of bonded transfer exists in Bangladesh. Even in the case of bonded transfer to EPZ, packages are sometimes opened during transportation.
- (4) Interviewee: Courier Company
- 1) Present Situation
- Lots of courier companies have their warehouses in Uttara District which is a 5-minute drive away from HSIA. In the airport, all offices of courier companies are in a building called CAGE.
 - The JICA Survey Team is advised that cargo for which import Customs clearance can be completed in the same day of arrival is about 2% only and that there are many cases wherein even if a cargo arrives on the previous night, it cannot be carried out the following day. The JICA Survey Team is also advised that the number of courier companies in Bangladesh is increasing. About 40 of the 62 registered courier companies are actually operating.
 - Handling procedures for the Customs clearance of courier shipment is almost the same as normal cargo, so there are no advantages for courier cargo.
 - The Asycuda system of the Customs is slow in processing.
 - The definition of document (DOX) is less than 2.5 kg and unbounded.
 - In other countries, courier cargo has a standard price under door-to-door. In Bangladesh, however, the consignee can designate a Customs (CNF agent), and in that case, even if a cargo is a courier, it stops at the airport in the same manner as normal cargo.
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2) Problems

- All cargoes of courier companies must go through a passage with a width of 8 feet (about 240 cm).
- Since the width of a hand trolley is about 4 feet, the clearance left on both sides is just 60 cm, which is too narrow for people to cross in succession.
- Since thousands of persons come and go through the passage, bodily injuries occur almost every day.
- Further, no ventilation and lavatory are available for use, so persons who wish to use the lavatory must go to farther areas such as the office of the Customs, which is about 10 minutes away on foot.
- There is no shade or roof outside the import bonded warehouses, so if cargo is left unattended and it becomes wet when it rains, which ultimately causes trouble to customers.
- The actual office hours of the Customs are short. It is supposedly 9:00 a.m. to 5:00 p.m., but they actually start at around 10:00 a.m. and work substantially for less than 6 hours since they take a lunch break of 1-2 hours.



Photo 4.2-1 Condition in front of the passage before work (around 8:00 a.m.)



Photo 4.2-2 Condition in front of the Import Warehouse

(5) Interviewee: Japanese Forwarder

Problems in export/import bonded warehouses in Dhaka airport and matters of desire for improvement of a Japanese forwarder are as follows:

A forwarder proposed ideas as follows:

1) Problems in Export Bonded Warehouse

- ➔ As about 600 tons a day of export cargo is handled in HSIA a day and annual growth rate of 10% is expected in the future, it is necessary to take a proactive measure for facilities because present aging and narrow facilities are not enough for smooth handling of those volume of cargo which causes damage, theft and loss of cargo.

Table 4.2-1 Cases of Lost Pieces of a Japanese Forwarder (2017)

No.	Pieces on HAWB	Lost Pieces	Ratio
1	2832	246	8.7%
2	3792	7	0.2%
3	4968	1	0.0%
4	7464	3	0.0%
5	1650	635	38.5%
6	1296	136	10.5%
7	7000	107	1.5%
8	15294	365	2.4%
9	4159	1241	29.8%
10	4600	1177	25.6%
11	15294	365	2.4%
12	4159	1241	29.8%
13	4600	1177	25.6%
14	128	14	10.9%
15	2028	150	7.4%
16	1700	270	15.9%
Total	80964	7135	8.8%

Source: JICA Study Team

- ➔ It is necessary to provide own acceptance area separated by airline and forwarder
- ➔ It is necessary to have additional scanner and weighing machines because it sometimes takes a few days to scan cargo at peak season which causes miss-loading on reserved flight.
- ➔ It is necessary to provide own build-up space separated by airline because all cargo is mingled up which causes miss-handling.
- ➔ It is necessary to introduce additional equipment to handle cargo speedy and safety because the GHA (Ground Handling Agent) does not have sufficient number of equipment e.g., High Lift Loader and Trolley for building up ULD and loading cargo on aircraft.
- ➔ It is necessary to introduce limited access road for cargo truck/van because it is hard for forwarders under the present situation that road maintenance/improvement is insufficient, and the large sized truck is restricted to drive in the daytime.
- ➔ It is necessary to introduce facility for goods which need temperature control and valuables because there is no facility for those at present.

2) Problems in Import Bonded Warehouse

- ➔ It is necessary to have commodious warehouse because many cargos not accommodated under the roof left unattended at ramp side which causes wet damage and damage on cargo.
- ➔ It is necessary to provide own acceptance area separated by airline and forwarder
- ➔ It is necessary to have commodious storage space and to train ground handling staff because the storage place is not fixed, it takes time to find cargo

3) The JICA Survey Team Inspected the Bonded Warehouse in Tongi.

Report of present situation and warehouse was made as follows:

- Cargo handled in the warehouse increases at the rate of 8% to 10% annually.
- The area of the bonded warehouse is about 1,500 m².
- About 15 workers report at the bonded warehouse and in the airport.
- Since Tongi is not the urban district of Dhaka, no traffic restriction on large trucks (larger than 1.5 tons) is implemented in daytime zone (6:00 a.m. to 8:00 p.m.)
- In the country, cargo collection works are not performed, and the normal practice is that cargo is brought by customers themselves.
- To prevent flooded water from seeping into the bonded warehouse, a concrete truck dock with a height of about 1.3 m is constructed later on.
- No concept of bonded transportation exists except for bonded transfer to EPZ (about 10 locations; processing for export using 100% imported materials).
- Since it is an air export warehouse, basically almost all of cargo is exported on the same day if the flight is reserved.
- It has three 4-ton trucks and one 1-ton truck.

4) Interview at the Downtown Office (Relocated in Dhaka Downtown after the Terrorism)

Problems and Matters of Desire for Improvement.

- In the export shipment, 60% is for EU, 30% is for the U.S., and 10% is for Asia. Almost all of the freighters are fully loaded.
- In HSIA, an average of 600 tons of export cargo is handled per day, and the volume is expected to increase 10% annually. As such, risk of loss, theft, damage, etc., of cargo caused by congestion in the warehouse would increase.
- In particular, no sufficient space for building up ULD is available in the area other than for EU (RA3) where serious congestion arises.
- The entrance of the bonded warehouse is congested, and there is no available space for unloading, weighing, and scanning of cargo, so operations do not go smoothly. Therefore, there are cases wherein it takes 4-6 hours for unloading of cargo from trucks.
- The warehouse has seven scanners, including one for fresh products, one for Emirates, and two for EU areas. There are three scanners for areas other than EU, but two of them were recently out of order, so only one was usable. Scanning per piece using this only unit caused serious congestion.
- B/U area other than EU (RA3) is where Biman Airlines staff should be working. However, since Biman Airlines workers cannot respond to urgent build up, forwarders employ their own staff on their own cost to manage time for departure. It is also implemented to prevent theft. This double payment actually places a cost of burden for them.
- It would be meaningless to plan a full automation system for export warehouses since power failure often occurs and manpower is cheaper. They said they experienced full automation in India in the past. However, it was never used and was left like a white elephant, so they returned to conventional manual build up. Since the principle of paying high costs is to quickly move air cargo, export warehouses need not have lots of racks for overnight storage. Rather, it is important for export warehouses to secure space for building up ULD on the flat floor.
- The company also desired that Japanese companies develop and manage the system.

(6) Interviewee: Local Forwarder, CNF Agent (Customs Broker)

1) Explanation of flow of cargo at Export Bonded Warehouse (in the order from the top)

- Weighing of cargo at the entry
- Inspection of document
- Scanning
- B/U (loading works onto ULDs)

After the abovementioned works in the bonded warehouse are finished, cargo is delivered to the GHA (Ground Handling Agent).

2) Regarding the Delivery to Export Bonded Warehouse:

- Unreserved cargo of mostly small and medium sized forwarders, which do not have their own warehouses or CFS and whose power relationship with airlines is weak (i.e., not booked in priority), are to be unloaded in front of the bonded warehouse. Although 30-hour is the demurrage period, there are cases wherein cargo is stored for 2-3 days and waiting is necessary until the reservation is obtained. This causes serious congestion of the place and consequently the loss or damage of cargo.
- Reserved and labeled cargo of forwarders, which have their own warehouse, is carried-in by unloading from trucks which are approached to the side of the place near the scanning area. Although congestion is not as serious as that in front of the bonded warehouse, unloading places are unavailable, especially during times when more than one freighter departs.
- The carrying-in place of reserved cargo is deferent from that of unreserved cargo and the transportation to the airport is not direct bonded transportation. No special permission is required for the carrying-in place.

3) Explanation of wage level of workers in bonded warehouse

- The minimum wage was increased by 100% in 2016 to become USD 180/month.
- There is no fixed place for storage of import cargo (inconsistent with the explanation by the Customs).
- Even in the case of cargo which is divided in several lots and stored in several places, arcana workers collect them like magic. However, this situation is the cause of loss, wet damage, or theft of cargo.

(7) Interviewee: Cargo Manager, Airline Cargo

Airline Cargo: The JICA Survey Team interviewed and heard the present situation of cargo bonded warehouse, etc.

- The volume of cargo, which was 5,000 tons a month in 2000, increased about five times from 20,000 to 25,000 tons a month from March to October 2017, which largely exceeds the processing capability of existing facilities.
- Only three airlines (i.e., Biman Airlines, Saudi Arabian Airlines and Etihad Airways) obtained the ACC3 Clarification*, and only these three airlines are authorized to be handled at the fully secured RA3 area. The other 34 airlines are handled, built up, etc., at areas other than RA3 with almost same area of 2,500 ft². (about 230 m²). *The applications by Emirates and Qatar are pending.
- Biman Airlines has large facilities and airlines should be a customer of GHA, Biman Airlines; however, Biman Airlines rarely comes and consults with customer airlines.
- With respect to import, any and all kinds of cargo arrive, including human remains (as the result of the US Bangladesh accident), dangerous goods, special cargo, fresh products, and animals. However, appropriate facilities are not available and cargo handling space is very insufficient. This constitutes impairing elements, including the environment of export cargo, for the economic growth of Bangladesh.

The interviewee pointed out four major problems:

- a) Space: decisively insufficient
 - b) Skills of workers: dissatisfied
 - c) Facilities: power failure occurs frequently; no evacuation route is available; and although this does not relate to facilities, since workers do not lock containers or dollies, accidents wherein they directly hit and damaged an aircraft occurred three times in the past three years.
 - d) Management: inadequate
- In the past, the lease contract of the bonded warehouse was executed between Biman Airlines and CAAB collectively, and each airline executed with Biman Airlines. Now, the lease contract can be executed between CAAB and the airline directly.
 - Currently, Biman Airlines is specifically treated favorably, such that it leases about 50% of the bonded warehouse and the remaining 50% is used by airlines other than Biman Airlines.
 - Under the contract, an airline cannot make a claim in case of damage or loss of cargo, unless the airline can prove full negligence on the part of Biman Airlines. Substantially, the airline pays damage compensation to customers for the most of irregularities including wet damages and destruction.
 - The Customs have separate organizations for export and import under the main office consisting of 20 to 25 officers each, and in the export bonded warehouse, the export Customs and Biman Airlines have respective offices on the left and right sides of the first floor (British way of indication)
 - The JICA Survey Team asked about the necessity of racks (CAGE in their language) in the export bonded warehouse. They said that since cargo need not be stored for 2-3 days and lots of cargo are shipped out on the same day, it is not necessary to have a large number of racks.
 - It is necessary to increase the space of CAGE. However, since Biman Airlines is completely lacking in maintenance capability, its personnel must receive various general trainings from foreign airlines. The cause of delay recovery also depends on the fact that even if they are trained, when any failure occurs, they do nothing after informing the manufacturer until the system is recovered.
 - The JICA Study Team asked for a response to the increase of courier cargo in Bangladesh. The courier facility is in a poorly constructed building which is the side of the import bonded warehouse constructed 15 years ago. The JICA Study Team are advised that, taking into account the development of Bangladesh in which e-commerce including big name intends to enter, sophisticated facilities for exclusive couriers should be provided.
 - The JICA Study Team are also advised that the system of the Customs for courier cargo needs to improve. The recognition of the Customs for HS code is low and if, for example, goods in a new category such as a drone is imported, they cannot judge properly which HS code should be applied and eventually applied the HS code for toys.

The JICA Survey Team asked about the number of GSE equipment operated in the bonded warehouse. They commented all the GSEs are short, at least double of them are necessary

- Towing tractors: 3 of 20 units are operated for export in three shifts each
- Forklifts: 10 tons (heavy)/3 units, 2 to 5 tons/2 units
- 20FT pallet dolly: 30 units
- 10FT pallet dolly: 150 units

(8) Interviewee: A Japanese Apparel Company

The JICA Survey Team got comment on present issues regarding to air cargo in HSIA.

- Level of Duty Charges
We do not have much of a choice because government determines it, however we think it high
- Problems in Customs clearance
It takes long time to clear Customs because the speed of information processing of Customs staff is too late
- Problems in processing Import Cargo
It takes long time to process handling of cargo because there should be shortage of space for handling
- Problems in processing Export Cargo
It takes long time to process handling of cargo because there should be shortage of space for handling
- Loss & Theft of Cargo
They occur from time to time. And a case of damage on cargo have occurred frequently because of the poor handling is of annoyance.
- Procedure Complication
Even though the cargo is in urgent need, it takes 4-5 days at the earliest is of annoyance.

Chapter5 Cause Analysis

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CHAPTER 5 CAUSE ANALYSIS

5.1 Outline

In this chapter, the issues related to operation is discussed and analyzed regarding the study and result of the analysis in the previous chapters. The cause analysis was conducted by following the check list shown in Table 5.1-1.

Table 5.1-1 Check-List of Cause Analysis

Large Item	Middle Item	Content
Human Error	Staff Ability	<ul style="list-style-type: none"> → Lack of education and training → Lack of license management → Lack of experience
	Manual	<ul style="list-style-type: none"> → Unimproved working standard manual → Manual is at variance with the current operation → Lack of common knowledge between the staffs
	Staff Allocation	<ul style="list-style-type: none"> → Unappropriate staff allocation → Low concentration by doing same work process for long time → Lack of attentiveness by doing same work process for long time → Undeveloped/updated work table
	Working Environment	<ul style="list-style-type: none"> → Motivation → Working Environment → Undeveloped training plan → Uncertain work flow/ work scope → Undeveloped organization (i.e salary, welfare and etc.)
	Communication	<ul style="list-style-type: none"> → Lack of communication between the managers → Lack of information sharing and its opportunity → Not able to give accurate direction → Lack of understanding the confirming the given direction
Organization Structure	Staff organization/ duties of every department/ motivation of staff,/ initiative ownership/ Occupation Ratio	
Facility and Equipment	Current Situation of the facilities and equipments/ possession of extra equipment/ updating situation of the facilities and equipments	
Operation • Maintenance and Management	<ul style="list-style-type: none"> → Development status of manual/ inspection → Development status of training plan/ budget status/ development status of mid-long term plan → Response plan for when accident occurs/ measures and cause investigation system for when incident occurs 	

Source: JICA Study Team

5.2 Comparison with Other Airports, Airlines and etc.

5.2.1 Comments on Comparison Tables

(1) Scale of Airport Facilities

1) Comparison of Annual Passenger Numbers and Passenger Terminal Floor Area

When comparing the passenger terminal floor areas to the annual passenger numbers at the three airports (passenger terminal floor area/annual passenger numbers), the figures for HSIA are the same as those for the dedicated low cost carrier (LCC) terminal at Narita International Airport Terminal 3. However, we see that the floor area per passenger is less than that of the Chubu International Airport which chiefly serves full service carriers. Therefore, when viewed in terms of passenger services, the terminal floor area at HSIA is more confined than the area in the full service carrier terminal and can be described as having a compatible space usage ratio for LCCs such as the case of Terminal 3 at Narita.

(2) Retailing

1) Comparison of Shop Floor Area and Passenger Terminal Floor Area

HSIA has a small retail floor area compared to Terminal 3 at Narita and Chubu International Airport. In addition, HSIA uses a fixed rent system. This indicates the likelihood that there is little understanding that increased floor area will contribute to increased revenue. In contrast, as was the case after privatization at Narita Airport, the use of a revenue-based commission type of rent system leads to the possibility of increasing non-aeronautical revenue by increasing floor area.

2) Comparison of Shop Numbers and Retail Floor Area

HSIA has less shops compared to Terminal 3 at Narita Airport and Chubu International Airport. Furthermore, there are not enough food and beverage outlets at HSIA because more floor area per shop is required. It is said that there is an allowance for increasing the number of shops and retail sectors to increase non-aeronautical revenue as mentioned above with regard to retail floor area.

(3) Providing Information to Passengers

1) Number of Passenger Information Counters

If the passenger terminal floor area at each airport is considered, HSIA is said to have a sufficient number of passenger information counters as compared to Terminal 3 at Narita and Chubu. However, because of the issues observed in Chapter 6, there is a need to review operating methods, to improve services provided by information staff among other service improvements, and in some cases, to add more passenger information counters as well as make other facility improvements.

2) Number of FIDS Units

Based on the passenger terminal floor areas at each airport, the number of toilets at HSIA is considered sufficient as compared to Terminal 3 at Narita and Chubu.

(4) Passenger Services

1) Number of Toilets

Based on the passenger terminal floor areas at each airport, the number of toilets at HSIA is said to be sufficient as compared to Terminal 3 at Narita and Chubu.

2) Number of Baggage Carts

HSIA has a sufficient number of baggage carts for the number of passengers, but given the observations of the issues noted in Chapter 6, some discussion is needed on improvements to operating methods and holding locations.

Table 5.2-1 Comparative Study of Operations at Other Airports

Category	Items	Hazrat Shahjalal International Airport(T1&T2)	Narita International Airport (T3)	Chubu International Airport
Airport Overview	Opening Year	1980	1978 (Terminal 3 opened in 2015)	2005
Scale of Facilities	Passenger Terminals	2	3	1
Capacity	Aircraft Movements p.a.	73,000 (2015)	245,705 (FY2016)	101,396 (FY2016)
	Passengers p.a.	6,500,000 including 5,600,000 International (2015)	6,871,856 (including 2,090,811 international) Throughout Narita : 39,620,801 (including 32,410,284 international) (FY2016)	10,962,596 including 5,234,303 international (FY2016)
	Cargo p.a.	258,010t (2015)	2,145,075t (FY2016)	189,205t (FY2016)
Scale of Facilities	Passenger Terminal Capacity	8 million	7.5 million Throughout Narita: 49.5 million (as of April 2017)	17 million (as of end of March 2017) * Source: March 2017 Financial Report
	Passenger Terminal Floor Space	International Terminal: 73,400m ² Domestic Terminal: 2,200m ²	67,000m ² Throughout Narita: 921,000 m ² (as of April 2017)	219,000m ² (as of end of March 2017) * Source: March 2017 Financial Report
	No. of Aircraft Stands	Bridge: 10Remote stands: 15VVIP: 2Cargo area: 3	11Throughout Narita: 171(as of April 2017)* Does not include engine run-up facility and corporate jet stands	65(14 fixed international gates)(6 international bus gates)(10 fixed domestic gates)(6 domestic bus gates)* Sources: Airport website and floor maps
Passenger Terminals	Retail Floor Space	Terminal 1&2 merchandising: 1,811m ² (19,498 ft ²) Terminal 1&2 food & beverages: 294m ² (3,165 ft ²) Terminal 1&2 services(Lounge): 2,179 m ² (23,463 ft ²) Service office (Bank & Hotel booth): 511m ² (5,511 ft ²) Airline office:2,471m ² (26,606 ft ²)	Merchandising: 2,200m ² Food & Beverage: 500m ² Services: 200m ² Throughout Narita: Merchandising: 2,200m ² Food & Beverage: 500m ² Services: 200m ² (as of April 2017)	Landside: 9410m ² Airside: 3537 m ² merchandising: 6,554 m ² food & beverages: 4,660 m ² services: 1,733 m ²
	No. of Shops (Airside, Landside, Restaurants, Merchandising)	Terminal 1&2 merchandising: 31 Terminal 1&2 food & beverage: 1 Terminal 1&2 services(Lounge): 9 Airlines: 27	Merchandising: 16 Food & Beverage: 8 Services: 15	Landside merchandising: 29 Landside food & beverage: 49 Landside services: 10 Airside international departure merchandising: 20 Airside international departure food & beverage: 3 Airside international arrival merchandising: 1 Airside domestic departure merchandising: 4 Airside domestic departure food & beverage: 2 * Sources: Airport website and floor maps

Category	Items	Hazrat Shahjalal International Airport(T1&T2)	Narita International Airport (T3)	Chubu International Airport
Passenger Terminals	No. of Passenger Information Counters	2	1 location	7 locations * Sources: Airport website and floor maps
	No. of Customer Feedback Boxes	6	3 boxes	4 boxes
	No. of Toilets (and No. of Multipurpose Toilets)	87(*the number of booth)	13 toilets (All of them are with Multipurpose toilets)	33 locations * Sources: Airport website and floor maps (Multipurpose toilets adjoin all toilets)
	No. of Children's Play Areas	2	2 areas	2 areas
	No. of Kitchenettes & Infant Nursing Rooms	2	10 locations	3
	No. of Smoking Areas (Inside & Outside Terminals)	Inside: 2 Outside: None	Inside: 5	Inside: 13
	No. of Baggage Carts (Landside & Airside)	Landside: 2000 Airside: None	Standard carts: 300 Throughout Narita Standard carts: 4,940 Small carts: 1,800 (airside)	Landside: 2,200 Airside: 250
	No. of FIDS	150	26 monitors (14 locations)	242 monitors (190 locations) Public area (including check-in counters and boarding gates)
	No. of Check-in Counters (Booths)	International: 56 Domestic: 12	Total: 6 counters (67 booths) International (A/C/E) : 3 counters (34 booths) Domestic (B/D/F) : 3 counters (33 booths)	International: Islands A to J (10 islands) Domestic: Islands K-P (6 islands) * Sources: Airport website and floor maps No. of Booths
	No. of Baggage Claim Conveyors	8	9 conveyors (International: 6 Domestic: 3)	9 conveyors (International: 5 Domestic: 4)
	No. of Baggage Make Up Conveyors	5	4 conveyors (International: 2 Domestic: 2)	9 conveyors (International: 6 Domestic: 3)
	No. of Elevators & Escalators	EV 8, ES 3(VIP 2, arrival 1)	Elevators: 13 Escalators: 9	Elevators: 50 Escalators: 30
	No. of Passenger Screening Lanes (International & Transit)	International: 3 Transit: None	International: 3 lanes Transit: 2 lanes (For International, maximum 9 lanes could be available)	8 lanes
No. of Bus Stops, Width of Curbside	None	For highway express bus: 17 For hotel bus & Clue bus: 2	Airport bus boarding locations: 9 Tourist bus boarding locations: 1	

Source: JICA Study Team

5.2.2 Comparison with Other Airlines

(1) Comparison of Service Level

Service level field survey results at the HSIA are compared with the standards of Japanese airlines and IATA (LoS).

The results showed a lower service level compared with that of Japanese airline companies and IATA in terms of international check-in, security control, time required to return checked baggage, and ground support equipment (GSE) occupancy rate.

Table 5.2-2 Comparison of Service Level

Item	Content	Field Survey Results at HSIA	LoS of Japanese Airlines	LoS of IATA
Passenger Service	International Check-in Waiting Time	Weekday: 20.2minutes Weekend: 24.1minutes	Within 15minutes	N/A
	International Check-in Process Time	Weekday: 3.2minutes Weekend: 3.3minutes	Within 2minutes	N/A
	International Check-in Total Time (Waiting+Process)	Weekday: 23.4minutes Weekend: 27.4minutes	Within 17minutes	10~20minutes
	Security Control	Weekday: 13.5minutes Weekend: 12.0minutes	N/A	5~10minutes
Immigration	Departure Immigration (Waiting+Process)	Weekday: 7.8minutes Weekend: 10.7minutes	N/A	5~10minutes
	Arrival Immigration (Waiting+Process)	Weekday: 9.8minutes Weekend: 10.5minutes	N/A	5~10minutes
Customs	Import Customs (Waiting+Process)	Weekday: 2.7minutes Weekend: 2.1minutes	N/A	1~5minutes
Ramp Service	Required time to return baggage	Weekday: 7.01seconds Weekend: 6.67seconds / per baggage	Within 5 seconds per baggage	N/A
	GSE occupancy rate	64.79%	Over 90%	N/A

Source: JICA Study Team

(2) Comparison of Handling Capacity

The JICA Study Team compared the handling capacity per staff of the ground handling service (passenger service and ramp service). The value of annual handling per staff indicates the number of departing passengers. The handling capacity of Biman Airlines is compared with the extremely low handling capacities of Japanese airlines in Narita International Airport and Southeast Asia, which are "67.9%" and "63.0%", respectively.

Table 5.2-3 Comparison of Handling Capacity

Biman Bangladesh Airlines (At HSIA)	Japanese Airlines (At Narita Airport)	Japanese Airlines (At South East Asia)
929.7	1370.0	1474.8

Source: JICA Study Team

5.2.3 OTP (On Time Performance)

The OTP of HSIA, Japanese international airports, and same-scale international airports were compared. The results are shown in Table 5.2-5. As shown in the table, the OTP is very low.

Table 5.2-4 Comparison of OTP with Other International Airports

Item	Content	HSIA	Narita International Airport	Chubu International Airport	Yangon International Airport	Kolkata International Airport	Bandaranaike International Airport
Airport Facility Scale	Throughput	8 Mil	49.5Mil	11Mil	7Mil	25Mil	6Mil
Handling Scale	Number of Departure and Arrival	38,118	251,639	50,701	41,961	71,415	33,585
Service Level	OTP	61.4%	82.9%	83.2%	81.3%	80.7%	84.6%

Source: JICA Study Team

5.2.4 Cargo Processing Capability Comparison with Other Airports

The large-scale Narita Airport, the Haneda Airport (which has similar handling volume), and the Manila Airport in Asia were compared with HSIA. Person and area units versus annual international cargo tonnage are adopted for the comparison of processing capability.

As a result, the reason why the unit ton per person in HSIA is smaller than in other airports (productivity per person worth) is surmised due to human powered handling, which means electrical facilities and equipment are not utilized.

About 2,000 people are estimated to be engaged in cargo handling because it is unclear how many staff are assigned for cargo out of the total 5,400.

The reason for the comparatively high value of cargo tonnage per area (high productivity per area) is that the cargo that overflowed from the warehouse is also considered handled in the warehouse premises.

Table 5.2-5 Comparison with Other Airports (Cargo)

Airport	Annual Cargo Tonnage	Tonnage/ Person	Tonnage/Area (m ²)
Narita Airport	2,140,075	1,192.6	8.4
Haneda Airport	457,540	696.3	26.0
Manila Airport	632,000	597.7	10.3
HSIA	284,000	142.0	10.2

Source: JICA Study Team

5.3 Passenger Services

5.3.1 Overview

Biman Arilines is an IATA member airline. As a requirement for membership, Biman Arilines acquired an IATA Operational Safety Audit (IOSA) certificate and compiles and maintains such documents in the handling manual.

However, there is a concern for the discrepancy between conditions required by the manual and the actual condition. For example, the staffing rate (ratio of actual staffing divided by planned staffing) is about 50%. Considering that the Biman Arilines flight handling is carried out with 50% of the necessary number of staff, doubts arise regarding the authenticity of the original planned staffing number.

In addition, the check-in counters are not allocated in a pre-planned method, but in a rather unordered manner, on a first-come first-serve basis. With an absolute shortage of check-in counters for the number of flights and the number of passengers to be handled, it is necessary for Biman Arilines to devise a way to implement smooth and efficient operations under this difficult situation.

Delay in departure handling is caused by staffing shortage and lack of check-in counters. Delay in gate assignment causes delay in the start of gate security process. Delay in handling leads to flight delay. Consequently, delay in gate assignment of another flight would lead to further delays as well.

In order to escape from this vicious cycle, it is necessary to improve the OTP rate and to raise it to a normal handling level.

5.3.2 Issues

(1) Personnel and productivity

While the planned staffing of the airport service division is 1782 staff, the number of the actual staffing is 883 staff. As the actual staffing is only "52.31% of the planned staffing, the division is significantly short staffed. It leads to an adverse situation such as "Staff can not take a vacation", "It is not possible to provide a necessary training". And it also creates an adverse state such as shortage of staff dispatched to handle foreign airlines flight. In addition, high absentee rate of Casual Staff causes a situation of short manpower.

And in comparison with the processing capacity of the Japanese airline, Biman Airlines's productivity in terms of annual number of passengers handled per employee was about two thirds of that of the Japanese airline.

Improvement of productivity per employee by "implementation of education and training", "verification and review of scope of work", "maintenance of manual / SOP maintenance", "verification and review of personnel placement" It is necessary to build a system that allows handling by limited number of personnel.

(2) Facility and Operation

Under the absolute lack of number of check-in counters, check-in counter C is used exclusively by US Bangla Airlines and Regent Airways that bring in own system while the CUTE (SITA) system has not been repaired for a long period, creating inefficient and unfair state. In addition, as there is no basic check-in counter assignment procedure in place in accordance with the airline's flight schedule, check-in counters are allocated on the 'first come first serve basis'. Each airline face with difficulty such as lack of counters which makes passenger wait for a long time, delay in check-in opening of the counter.

According to the field survey, the waiting time for check-in is longer than the LoS of the Japanese airline (within 15 minutes), the fact that HSIA greatly "weekdays / 20.2 minutes" and "holiday / 24.1 minutes".

Repair of row C's Cute system and use of the check-in counter allocation sheet will enable efficient and fair counter operation.

(3) Quality

According to the field survey, the procedure time of the check-in at HSIA 1.5 times higher than the Japanese airline's LoS (within 2 minutes) the Procedure time is as follows: "Daily weekday / 3.2 minutes" and "holiday / 3.3 minutes" There is a fact found out. The result of the field survey shows that the skills of the staff are insufficient.

There is also a lack of sense of customer satisfaction (CS) on passenger service. For example, guidance staff is not arranged at the counter, and overall guidance to passengers is insufficient. It is chaotic at check-in as the row waiting for check-in meanders and the starting point end point is unclear. Furthermore, because the carts are not collected and returned to the pool, uncollected carts block passenger movement. Thus convenience and comfort are low.

The lack of skills and the lack of sense of CS leads to low handling quality, and for improvement the following measures need to be taken "Implementation of education and training (skill / CS)" "Verification and review of scope of work" "Work process development" "Manual / SOP maintenance" "Valuation of personnel allocation It is necessary to improve the quality by review "and. morales of staff, motivation

(4) Motivation and Moral of the Staffs

Low morale behavior such as "Absentee rate of Casual Staff is high", "Eating and drinking in the check-in counter during the peak hour ", "Handling of baggage carelessly" etc. are prominent.

Immediately after the study group entering at the arrival sorting area at the time of this survey, the staff stopped "throwing away the baggage" at baggage return (however, after a while they resumed dumping). This is a proof that "the staff are aware that they are not supposed to do it".

Naturally, guidance for staff is necessary, but training work managers and placing them at work site may be effective. And it is necessary to ensure thorough guidance. It is also important to consider wage levels and welfare benefits that will improve morale and motivation of staff.

5.3.3 Cause Analysis

Cause analysis and Issues of Passenger Service are shown as in Table 5.3-1.

Table 5.3-1 Cause analysis and Issues of Passenger Service

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
Organization Structure	Personnel	Personnel shortage at Biman Airlines Airport Services members	<ul style="list-style-type: none"> Personnel structure Business contents of each department Reconfirmation of the number of staff at Biman Airlines Airport Services and calculation of required number 	1-1
		The shortage of personnel dispatched to foreign airlines that Biman Airlines is entrusted is remarkable, occurring constantly.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Lack of initiative Insufficient personnel, the number of temporary staff to foreign airlines is not determined 	1-2
		There is many absenteeism in Casual Staff, causing a person shortage	<ul style="list-style-type: none"> Personnel structure Motivation of staff Insufficient personnel, form of employment, moral 	1-3
		Is the actual flight (arrival / departure) number per hour within the work capacity of Ground Handling?	<ul style="list-style-type: none"> Personnel structure Business contents of each department Although it is the actual arrival and departure number within the departure and arrival processing capacity of the airport, ground operation is indispensable for aircraft operation. In the survey, there are peak hours 	1-4

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
			during which 7 flights concentrate only on passenger flights, but no corresponding work regime has been established	
		Personnel shortage during Hajj period	<ul style="list-style-type: none"> Personnel structure Business contents of each department Lack of initiative Biman Airlines has about 50 staff dedicated to the Hajj period and affects normal airport handling 	1-5
		At departure sorting, the handling of Biman Airlines while "8 staff are assigned to handle" for "departure 2 flights (1 flight / large aircraft, 1 stool / small aircraft)" only 4 staff are assigned to handle for foreign companies at the same time "2 departures / Large aircraft, 1 flight / small aircraft) "from Biman Airlines" staff 4 people "was dispatched. As the handling of the foreign airlines cannot be performed with 4 staff. They have to dispatch their staff for handling.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Lack of initiative Impact by Insufficient personnel 	1-6
	Operation	Due to the poor OTP, handling cannot be conducted as planned.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Lack of initiative Due to insufficient production system, delays create further delays. 	1-7
	Departure	Since there are only 4 terminal openings in 6 locations, crowded is intense	<ul style="list-style-type: none"> Personnel structure Business contents of each department Impact by insufficient personnel 	1-8
		Terminal entrance for business class passenger is not open.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Originally the No.1 gate is for business class, but it is closed due to insufficient personnel 	1-9
Organization Structure	Baggage	Some baggage cart is placed near the arrival turntable, but the proper replenishment is not made, and the passenger is taking the cart pool. Also, it is difficult to understand the location of the cart pool.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Cart replenishment system, cart pool location guidance 	1-10
	Wheelchair	In the case of Remote spot, Ambulance Lift is not assigned, there are instances where the wheel chair is hand carried by the staff. There is serious danger for injury.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Number of Ambulance lift (2 units), how to assign 	1-11
Human Error	<ul style="list-style-type: none"> Issues of Staff ability Issues of Manuals 	(Baggage) In departure and arrival sorting, handling baggage dangerously acts such as "throwing away" or "reversing from top" are observed.	<ul style="list-style-type: none"> Lack of education and training Discrepancy between actual work and manual Not being thoroughly informed to staff 	1-12

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
		(Baggage) When accident baggage occurs, PIRs are issued to passengers, but there are cases where they are not issued. Baggage arrived on the next flight, letting passengers come to receive the baggage.	<ul style="list-style-type: none"> Lack of education and training Discrepancy between actual work and manual Not being thoroughly informed to staff 	1-13
	<ul style="list-style-type: none"> Issues of Staff ability Issues of Manuals Staff allocation 	(Baggage) It takes too much time to return baggage for arrival of flight.	<ul style="list-style-type: none"> Lack of education and training Discrepancy between actual work and manual Work process unfinished / Work process not updated In-time from sending to sorting, Break down staff shortage 	1-14
		(Biman Airlines Check-in) Signboard is difficult to understand for passenger.	<ul style="list-style-type: none"> Lack of education and training Discrepancy between actual work and manual Work process unfinished / Work process not updated there is no indication of flight number / destination There is no guidance and assistance by staff 	1-15
	<ul style="list-style-type: none"> Issues of Staff ability Work environment 	(Biman Airlines Check-in) The staff eat and drink in the counter at the time of congestion, and kept the passenger waiting during that time.	<ul style="list-style-type: none"> Lack of education and training Motivation Work environment Moral issues 	1-16
	<ul style="list-style-type: none"> Issues of Manuals Communication issues 	(Check-in) Securing the check-in counter is on "the first-come and first-serve basis", and each airline face difficulty since it is in a normal state, such as "counter opening is delayed", "place is not fixed".	<ul style="list-style-type: none"> Discrepancy between actual work and manual There is no accurate instruction Inadequate understanding of instruction content There is no basic assignment table. 	1-17
		(Gate) Gate assignment is late, and passenger cannot be directed (gates cannot be guided at check-in).	<ul style="list-style-type: none"> Discrepancy between actual work and manual There is no accurate instruction Inadequate understanding of instruction content There is no basic assignment table. Although "first come, first serve" is the principle, there is a lot of departure delay, with balls, the arrival flight gate assignment is delayed behind. 	1-18
		(Gate) Gate opening is delayed, gate security check start is delayed.	<ul style="list-style-type: none"> Discrepancy between actual work and manual There is no accurate instruction Inadequate understanding of instruction content Gate assign is slow 	1-19
Operation Maintenance and Management	Check-in	Row C's CUTE (SITA) has not been repaired. As a result, it is monopolized by US Bangla Airlines and Regent Airlines who bring in their own systems.	<ul style="list-style-type: none"> Correspondence situation at the time of failure Maintenance inspection is not carried out reliably 	1-20
		Baggage belt stopped half a day due to BHS failure. In that case you have to carry a hand.	<ul style="list-style-type: none"> Correspondence situation at the time of failure Maintenance inspection is not carried out reliably 	1-21

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
Facility and Equipment	Check-in	There is not enough check-in counter, it is narrow and crowded.	<ul style="list-style-type: none"> • Facility current condition • The number of counters is insufficient check-in is carried out with few counters. • The shelf of the departure document is installed in the pillar adjacent to the check-in counter, causing passenger's stagnation, which is a cause of congestion. • The cart is left behind and it blocks the row of passengers. • Some airlines have not restricted visitors to enter the check-in counter area. 	1-22
	Biman Airlines Check-in	The left side of Row D is narrow, passenger crowd is heavy	<ul style="list-style-type: none"> • Current condition of Facility and Equipment • Storage status of spare parts • The number of stance poles installed is insufficient so they cannot control the standby queue of passengers. Also, the used cart has been left untouched. 	1-23
	Check-in	The display of the check-in counter is difficult to understand	<ul style="list-style-type: none"> • Current condition of facility and equipment • The airline's indication is a hanging type signboard, most of the flight number / destination is not displayed. 	1-24
		Scratches have occurred at the check-in counters, and paint is peeling in some places.	<ul style="list-style-type: none"> • Current condition of facility and equipment • Update status of facility equipment • Maintenance inspection is not carried out reliably. 	1-25
	Gate	It takes time for boarding and disembarking of large aircraft (B777, A330 etc.).	<ul style="list-style-type: none"> • Facility current condition (There is one bridge type of PBB, only one aircraft door can be used.) 	1-26
		Gate security check takes time, and it will be kept waiting for a long time	<ul style="list-style-type: none"> • Facility current condition (The centerize security is difficult because the structure of the terminal is mixed in the departing passenger and the arriving passenger in the concourse.) 	1-27

Source: JICA Study Team

5.4 Ramp Service

5.4.1 Overview

An airline's OTP impacts heavily on its operation. Foreign airlines that outsource handling to Biman Airlines may handle their flight by assigning their own staff independently to avoid the impact of Biman Airlines's staffing shortage for passenger services, but they have to rely on Biman Airlines handling for the ramp service because they do not own their own GSE.

Like passenger services, manpower is short. Furthermore, because of the lack of GSE, proper handling in both Biman Airlines and foreign airlines have yet to be provided.

Although replenishment is progressing according to the purchase plan of GSE, there are concerns that new products will become unserviceable in several years due to bad handling in everyday use.

The filling rate of the staffing is about 60% of the stipulated capacity. As with passenger services, there is doubt about the authenticity of the original capacity, causing a situation where the required staffing can not be secured.

Arrival and departure handling is delayed due to the lack of staffing and GSE. Delay in handling leads to flight delay and which further triggers another flight delay. In order to escape from this vicious cycle, it is necessary to improve the OTP rate and to raise it to a normal handling system.

5.4.2 Issues

(1) Personnel and Productivity

The planned staffing of the GSE department is 540, the actual staffing is 313. As the staffing ratio is (ratio of actual staffing divided by the planned staffing) calculated as 57.96%, the figure shows that the department is extremely short staffed. The department is in a state as "the staff can not take a vacation", "they can not provide a necessary education to the staff". Regarding GSE operation, not only regular employees but also Casual Staff (part-time) are assigned to the task in a large number, absenteeism rate of the basic staff is high, causing a situation where necessary staffing can not be secured.

And in comparison with the productivity level of Japanese handling business processing capacity with the Japanese airline, the annual number of passengers handled per employee was about two thirds of that of the Japanese airline.

Improvement of productivity per employee, limited by the "implementation of education and training", "verification and review of scope of work", "maintenance of work process", "manual / SOP maintenance", "verification and review of personnel placement" We need a system that allows handling by personnel.

(2) GSE Maintenance and Management

Regarding GSE maintenance and management, situation is as follows: GSE's equipment shortage is caused by a high failure rate (35.21%).

There is a shortage of qualifiers of "Mechanical / Electrical / Electronics / Industrial Production Engineering" necessary for GSE maintenance

- The skill of "Mechanical / Electrical / Electronics / Industrial Production Engineering" necessary for GSE maintenance is low
- "Periodic maintenance" cannot be carried out as planned due to lack of qualified personnel and the level is low. As a result, breakdown of GSE equipment easily occurs.
- Due to the lack of qualified personnel, it takes time to repair and the high failure rate of GSE continues.

Regarding GSE's operation rate, with the rate at HSIA is 64.79%, the rate of Japanese airline's is 90% (LoS).

"Preparation of GSE maintenance plan / inspection item / maintenance record management analysis method / Maintenance method formulation," "Implementation of periodic maintenance of GSE," "Implementation of education and training of maintenance skills," "Verification and review of scope of work," "Verification of personnel allocation It is necessary to have a system that can improve the maintenance and management of GSE and productivity per employee by reviewing."

(3) Safety and Quality

We confirmed the handling that leads to damage risk of aircraft. Specifically, "Dolly was left with no brake at the aircraft side," "A container on the dolly is not locked," "An empty container is left on the ramp (in the vicinity of the aircraft) and the container door is open or semi-open so there is a possibility of the container being blowing off with a strong wind." Also, "There are countless scars in the pillars of departure sorting building, countless bumps to the pillar due to rough handling of the dolly, causing damage to the dolly and hindering use in a short period of time" etc. The messy operation of the GSE It has occurred. In the container yard (container place), it is in an unmanaged state such as direct placement, opening of the door, disorderly placement, disorderly pallet overlap, container damage, cluttered neglect of net and rope, leave of garbage, etc. The above risk was high. Some workers are working with "sandals", and the risk of injury to workers is also high. Overall safety risk is high.

According to the field survey, the time required for processing checked baggage return for the flight arrival is "weekdays / 7.01 seconds", "holiday / 6.67 seconds" as compared with the Japanese airline's LoS (within 5 seconds to handle one baggage,) at HSIA. When replacing it with a specific time, if it takes "60 minutes" to return baggage in Dhaka, if Japanese handling standard can be carried out, the required time can be reduced by about 30% to "42 minutes".

The result of the field survey shows handling quality is low. The skill shortage is main cause for low quality. For improvement following measure shall be taken "Safety and Quality Standards Formulation", "Implementation of Education and Training (Safety / Skills)" "Verification and Review of Business Contents", "Improvement of Work Processes", "Manual / SOP Maintenance", "Safety by Verification and Review of Personnel Placement" And quality improvement is necessary.

(4) OTP

The OTP record at HSIA in 2017 is "61.4%". Compared to neighboring countries international airports with the same volume of flight number, it is found that Yangon (Myanmar) is "81.3%" and Colombo (Sri Lanka) is "84.6%", OTP performance at HISA is relatively low. In addition, it is found that the OTP performance of HSIA is low, compared with larger airport in size Kolkata (India) with volume order of two times being "80.7%", Manila (Philippines) with about 4 times the scale is "67.5%". Also, compared to Japan's international airport, Narita International Airport is "81.83%", Tokyo International Airport (Haneda) is "86.75%", which indicates that OTP performance at HSIA is low

The main reasons for the low OTP at HSIA are: (1) Bad weather, (2) Airport operation restriction due to military aircraft departure and arrival, (3) Airport operation restriction due to the arrival and departure of VVIP / VIP flight, (4) Shortage of PBB, (5) Ground handling staff shortage, (6) Ground handling skill shortage, (7) GSE deficiency etc.

(1)~ (3) The cause are related to natural phenomena and national management, which is inevitable. The cause (4) is eliminated by constructing a new passenger terminal. For (5) ~ (7) it is possible to solve the problem. With (5)~ (7) resolving, it is possible to improve OTP to "70%" even at the current terminal.

(5) Staff morale, Motivation

Low morale such as "Low safety consciousness", "High absentee rate of Casual Staff", "Rough manipulation of GSE", "Careless handling of baggage", etc. are noticeable.

Although guidance to staff is necessary, training work managers and place them on the work site. It is

necessary to keep guidance thoroughly. It is also important to consider wage levels and welfare benefits that will improve morale and motivation of staff.

5.4.3 Cause Analysis

Issues and Cause Analysis of Ramp Service is as shown in Table 5.4-1

Table 5.4-1 Issues and Cause Analysis of Ramp Service

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
Organization Structure	Personnel	Whether the actual number of the flight arriving, and departing is with the ramp handling capacity	<ul style="list-style-type: none"> Personnel structure Business contents of each department It is the actual arrival and departure number within the departure and arrival processing capacity of the airport, but ground operation (ground handling) is indispensable for aircraft operation. According to the survey, there was a peak time zone in which 7 flights were concentrated only by passenger flights. 	2-1
		Lack of staffing at the Biman Airlines ramp service	<ul style="list-style-type: none"> Personnel structure Business contents of each department Reconfirmation of the capacity of Biman Airlines service (Is it really necessary personnel) Recalculate necessary number of Biman Airlines ramp service (necessary personnel and equipment for each equipment) 	2-2
	Operation	Due to poor OTP, the ramp handling cannot be performed as planned.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Lack of initiative Due to insufficient production system, delays create further delays. 	2-3
	Personnel and GSE equipment	The shortage of temporary staff to foreign airlines contracted by Biman Airlines and the shortage of GSE equipment are conspicuous and occur constantly.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Lack of initiative Insufficient personnel and lack of GSE, number of temporary staff to foreign airlines not determined 	2-4
	GSE equipment	Due to shortage of push back tractor (PBT), flight departure is delayed waiting for arrival of PBT at the gate. There are some cases that flight was delayed for over 10 minutes.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Lack of initiative Impact by equipment and insufficient personnel 	2-5
		High maintenance defect rate of Biman Airlines GSE	<ul style="list-style-type: none"> Personnel structure Business contents of each department Motivation of staff Implementation status of periodic inspection and daily inspection. Corrective repair as appropriate 	2-6

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
Human error	• Staff ability Issues • Manual Issues • Staff allocation	(Handling) There was no provision of a belt loader car at the arrival flight (bulk equipment) of the contract airline company, and baggage was taken down directly from the cargo door.	• Lack of education and training • Discrepancy between actual work and manual. • Not being thoroughly informed to staff • Work process undeveloped • Impact by equipment and insufficient personnel.	2-7
	• Staff ability Issues • Issues of Manuals	(GSE equipment) Dolly is in the state of no break at the ship side. Damage risk of aircraft (Three in the past, detailed investigation in progress)	• Lack of education and training • Discrepancy between actual work and manual. • Not being thoroughly informed to staff • There is no safety improvement measures.	2-8
	GSE equipment	Inappropriate container handling UNLOCK state of the container on the dollies. Aircraft damage risk as well. Leave the empty container on the ramp (near the aircraft) (placed directly on the ramp). Due to the state of the door open or semi-open, there is a possibility of blowing off with a strong wind.	• Lack of education and training • Discrepancy between actual work and manual • Not being thoroughly informed to staff • There is no safety improvement measures.	2-9
Human Error	Handling	Ramp cleaning is not being implemented.	• Lack of education and training • Discrepancy between actual work and manual • Not being thoroughly informed to staff • Periodic cleaning of the ramp is not being carried out due to lack of consciousness of cleaning.	2-10
		Regarding the staff's clothing, "safety vest" prescribed by the regulations is all worn. "Safety shoes" "gloves" have variations. For shoes "sandals" are worn. (The regulations are not complied with.)	• Lack of education and training • Discrepancy between actual work and manual • Not being thoroughly informed to staff	2-11
		In bulk aircraft, there are behaviors such as "let them fall as it is" or "throw away" when taking down baggage, and we cannot see consciousness of careful handling.	• Lack of education and training • Discrepancy between actual work and manual • Not being thoroughly informed to staff • There is no safety improvement measures.	2-12
		At departure and arrival sorting, actions such as "throwing away baggage", "dismissing from above", etc. are observed.	• Lack of education and training • Discrepancy between actual work and manual • Not being thoroughly informed to staff • There is no safety improvement measures.	2-13
		• Staff ability Issues	(PBB) There is variation in the ability of PBB operators, it takes time.	• Lack of education and training • There is no capacity building measures.
		(GSE equipment) There are countless scars on the pillars of departing	• Lack of education and training • There is no safety improvement measures.	2-15

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
		sorting. Because the dolly operation is rough, countless collisions with the pillars cause damage to the dollies and hinder use in a short period of time.		
	• Manual Issues • Communication Issues	(PBB) Because the principle of PBB assignment is "FIRST COME, FIRST SERVE", SPOT assignment is slow.	<ul style="list-style-type: none"> • Discrepancy between actual work and manual • There is no accurate instruction • Inadequate understanding of instruction content • Since there is no basic assignment for each summer and winter time table, it is occasionally operated. 	2-16
Operation • Maintenance and Management	PBB	Auto-adjustor function of PBB does not work properly	<ul style="list-style-type: none"> • Correspondence situation at the time of failure • Repair is not being carried out. 	2-17
		Because there is a hole in the PBB canopy, a lot of mosquitoes invade into the plane from there. There was a case that MH flight was delayed 2 hours	<ul style="list-style-type: none"> • Correspondence situation at the time of failure • Repair is not being carried out. 	2-18
Facility and Equipment	GSE	The GSE which was inoperative due to malfunction in some parts of the terminal building side was corroded, the same state as discarding. "Pushback tractor in scrap state" "Faux torba" etc.	<ul style="list-style-type: none"> • Current condition of Facility and Equipment • Update status of facility equipment • What was left unattended was UNITED AIRWAYS 'GSE that failed, so it was a situation where we could not afford to do it. 	2-19
		Regarding the state of the container yard (container place) It was in an unmanaged state such as direct placement, opening of the door, disorderly placement, disorderly pallet overlaps, container damage, cluttered leave of net and rope, leave of garbage etc. From the viewpoint of ramp safety, we hope to recover the administrative condition such as ordering quickly and arranging waste / garbage.	<ul style="list-style-type: none"> • Current condition of Facility and Equipment • Update status of facility equipment • Absence of administrator. 	2-20
		In bulk equipment, we use pallet dollies to carry baggage. It is directly linked to baggage damage.	<ul style="list-style-type: none"> • Current condition of Facility and Equipment <p>(There are no safety improvement measures. There is no baggage cart.)</p>	2-21

Source: JICA Study Team

5.5 Air Cargo Handlings

5.5.1 Issues

(1) Import Cargo

- 1) Usually cargoes unloaded from aircraft are delivered and accepted under the canopy of warehouse and the burden of responsibility shifts to warehouse section from ramp section. However, in HSIA, those cargoes cannot be delivered to warehouse due to congestion of narrow warehouse, which makes shift of responsibility unclear.
- 2) Only narrow passage is secured for hand trolleys to move under the canopy storage. Cargo storage is configured disorder and cargo is placed direct on the floor where enough space is unsecured for forklifts to move, such a situation force labor by only human handling except for heavy cargo.
- 3) There is a refrigerator, but it is aged and small.
- 4) Cargo location is controlled in a method which an outsider is unable to understand.

(2) Export Cargo

- 1) The waiting time for trucks to carry cargo into the warehouse is extremely long. This is evident especially in the unreserved cargo storage area which is essentially full, and the cargo cannot be unloaded unless other unreserved cargo is reserved and moved out. It takes a long time to unload cargo, sometimes taking all day and all night.
- 2) Export warehouse is divided into two parts, one is called the “RA3 area” and the other is called the “common area”. Only Biman Airlines, Etihad Airways, and Saudi Arabian Airlines are allowed in the RA3 area. In the common area, the cargo of over 30 airlines is handled in a narrow space. However, depending on the season and time, the common area is usually very congested which makes it hard to secure space for building up the ULD.

(3) Common Agenda

- 1) There are Manuals, however basic action for cargo handling such as not throwing or stamping on cargo are not complied with.
- 2) Forklifts and skid are not handled efficiently in an orderly manner like in Japan (There are forklifts, however the number of frequently used light weight forklifts is small and on the contrary, there are 8 heavy weight forklifts which is abnormal formation).
- 3) Cargo staff appear to have no knowledge in safety and quality. Cargo handling is shallow, and training is insufficient.
- 4) The location for the pallet and skid storage is not fixed, and the items are scattered inside and outside of the warehouse.
- 5) Lack of acknowledgement of the rapid growth of courier cargo and coping with the explosive diffusion of e-commerce. The courier cargo facility is poor and has no advantages in clearing speed over normal cargo.
- 6) There is no fixed storage facility for transit cargo.
- 7) There is no car parking lot in the cargo area.

5.5.2 Cause Analysis

Issues and Cause Analysis of cargo handling is shown in Table 5.5-1

Table 5.5-1 Issues and Cause Analysis of Cargo Handling

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
Human Factor	Frontline Work	Throw, stamp and lay on cargo	• Lack of basic training to cargo staff on site	3-1
		No volunteered work	• No incentives for volunteer work	3-2
	Export Handling	Build up work in RA3 is slow	• Lack of skilled staff for building up ULD	3-3
		Safety handling is not complied for high pallet B/U	• Infer lack of training for safety handling	3-4
		Some cargoes on ULD are crumbling because of loose build up	• Lack of basic training and awareness of safety	3-5
	Import Handling	Chaos situation that ULD, cargo and equipment left unattended in ramp area	• Unclear of ULD and cargo storage location	3-6
			• Unfamiliar with efficient work using light weight forklift and floor space is ill ordered.	3-7
	Customs Work	Takes time for Customs Clearance	• Shortage of Customs officer and insufficient knowledge in applicable HS code	3-8
			• Import settlement is done by only L/C and takes time to open account and is expensive	3-9
			• Import duty is high and takes time for negotiation due dependent on individual personnel	3-10
Organization	Staffers	Part-timer mill about	• High absence rate of "part-timer" which consists almost half of total Biman staffers is hard to keep everyone informed of handling	3-11
		Too many number of staff for the scale of operation	• Not proper assessment is being done for required number of actual working staff at each site	3-12
		No supervisory staff on site is observed	• Shortage of trained up instructors on site	3-13
	Accumulation of Knowledge	Specialized knowledge in cargo seems not being piled inside organization	• Role of teaching and accumulation of knowledge in organization is not done well	3-14
	Two-Tiered Organization	Unable to observe safety, quality and efficient based management	• Unless boss instructs, cargo staff is not immobile	3-15
		Reporting line does not work well in organization	• Communication centered to some particular persons	3-16
		Only a few managers handle most the matter on site	• On-site supervisory staff who plays a leading role and judge is not trained up	3-17
Facility/Equipment	Export	Common area in export warehouse is small and congested	• Common area where more than 30 airlines operate with hoary equipment in narrow space from where comparatively vacant RA3 area takes space disproportionately	3-18
			• Dependent on human labored work using hand trolley due to insufficient handling space	3-19
			• Detention of cargo in front and back of the scanning machine promotes more congestion	3-20

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
Facility/Equipment	Export	Sometimes it takes long time to unload cargo from truck due to congestion of unreserved cargo storage area	• Air cargoes are concentrated to bonded warehouse only inside the airport	3-21
			• Cargo cannot unload until stored unreserved cargo is booked and move, however those cargoes are for medium to small sized agent does not have power over carriers which prolongs detention period	3-22
			• Not enough space for trucks turn in unreserved cargo storage area	3-23
		No air-conditioning in the warehouse	• Facility is aged and not equipped	3-24
	Import	Bonded cargo, skids and ULDs are wide spread in front of Import Warehouse	• There is no designated storage area or full for ULD/skid/equipment and traffic line for forklifts are not secured	3-25
		Theft and loss of cargo occur	• Location control of cargo is unclear and cargo is overflowed to ramp where security is not enough	3-26
		Serious situation in cargo wet damages	• Cargoes unable to store inside the warehouse lie neglected in open air	3-27
		No efficient work using IT WMS	• Dependent on labor intensive work using hand trolley	3-28
	Storage for Special Shipment	Capacity is not enough for referring and special cargo storage	• It becomes small due to unexpected growth of cargo volume	3-29
	GSE in Warehouse	Shortage of light weight forklifts and floor is poor strength and rough	• Not assessed required number of GSE and poor maintenance of floor	3-30
	Aircraft Parking Spot	Loss of time and fuel consumption of GSE moving if the parking spot of cargo freighter is far away from cargo warehouse	• Lack of awareness of losing time and spare fuel consumption in transport of GSEs for assigning remote spot which influence OTP performance and cause of increasing malfunction of GSE	3-31
	Car Parking	There is no car parking around cargo area	• No space for car parking in cargo area	3-32
	Courier Facility	Courier facility is poor and no advantage in speed for processing Customs clearance to normal cargo	• No acknowledgement for courier cargo rapidly growing keeping pace with taking up E-commerce globally	3-33
Operation and Maintenance	GSEs in Warehouse	35% of GSEs in the warehouse is unserviceable	• Even though cargo staff was trained by GSE manufacturer, they inclined to take responsibility as his/her mistake liable to wait until manufacturer to repair takes long time	3-34
		Shortage of necessary wheeled vehicles	• Assessment of required number of GSEs and maintenance is not properly done	3-35
	Scanning Machine	Shortage of number of X-ray scanning machine in common area	• Maintenance of scanning machine is not properly done and not considered well of layout and practice	3-36
	Transit Cargo	There were transit cargoes on dolly in the ramp area	• No designated storage area for transit cargo	3-37
	Customs Office	Actual business hours are shorter than six hours	• Late open of office and long rest time	3-38

Source: JICA Study Team

5.6 Passenger Terminal Management

5.6.1 Issues

Issues regarding passenger terminal management are shown below:

- ➔ The survey focused on various aspects related to the management of passenger terminals.
- ➔ There was a lack of incentive for the airport to proactively manage tenants (and their sales) due to the underlying fact that operating charges in tenant contracts are based on fixed rents according to floor space.
- ➔ By switching the fixed rent to commission rent for sales, it is possible to make the sales improvement of the store the common interest of the airport and the tenants. With this, it is possible to establish the cycle of "store attraction → tenant management → sales promotion → attractive shop attraction".
- ➔ In terms of lease management, the inability of the Civil Aviation Authority of Bangladesh (CAAB) to collect facility usage charges from airlines for check-in counters is an issue.
- ➔ During the investigation to identify the problem, the management situation of the facility, which should be done orderly by the airport side, such as the check-in counter facility and the office room area is found to be undesirable.
- ➔ The first impression of the terminal services was that a certain level of cleanliness is maintained in the public passenger areas. However, even within the passenger terminal lobbies, there were inconceivable scenes in Japan, such as chairs and tables abandoned in less-visible areas and a cat found on the airside. Facilities such as information counters, smoking areas, and customer feedback boxes were limited compared to the scale of passenger terminals. The JCIA Study Team would like to confirm the situation on-site and to identify potential improvements.
- ➔ The JICA Study Team will explore both short-term improvement plans that can be implemented within existing terminal operations, as well as long-term strategies that treat the opening of Terminal 3 as an opportunity for adopting new systems following its demarcation from existing terminals which will be discussed later.

5.6.2 Cause Analysis

The issues and its cause regarding passenger terminal management are shown in Table 5.6-1.

Table 5.6-1 Cause Analysis Passenger Terminal Management

Major item	Middle item	Current Situation & Issues	Cause Analysis	Issue Number
Tenant Management				
Organizational structure	Job descriptions of each department	They play no part in leasing (attracting interest) and do not create any marketing materials for that purpose	• Because of fixed rent, the ability to attract attractive stores does not work	4-1
		Not working to improve product composition and attitude	• Because of fixed rent, I am not interested in sales of tenants • Regarding the product composition, the airport side thinks that it should not be brought out	4-2
		No sales promotion activities undertaken	• Because of the fixed rent, the airport side does not need to promote sales activities • Because it is not grasping sales, it is impossible to analyze the current situation and it is difficult to consider effective improvement measures	4-3
Organizational structure	personnel organization	There are no full-time staff stationed at the airport	• As fixed rent, there is no need to actively manage tenants	4-4
Facilities & Equipment	Current Situation of Facilities & Equipment	There are very limited number of restaurants	• Required confirmation	4-5
		Retail and duty-free shops are operated by local tenants only and there are no global brands	• Because of fixed rent, the ability to attract attractive stores does not work	4-6
Operation & Maintenance	Agreement	Contract format involves rents based on floor space	• Confirm whether there is a concept of commuting rent in Bangladesh	4-7
		No grasp of sales figures	• Because it is fixed rent, you do not need to grasp sales	4-8
Lease management				
Operation & Maintenance	Agreement	Check-in counter rents have not been collected from airlines	• Biman Airlines is a state-owned enterprise and the likelihood that the government has the same or higher voices as the CAAB within the government (similar cases are also found in other countries)	4-9
Operation & Maintenance	Current Situation of Operation	Even when counters are not in use, stanchions and class signage (SQ) remain set up in front of check-in counters	• CAAB's lack of facility management awareness • The fact that the counter loan fee is not taken also contributes to lack of consciousness	4-10
		The entire office area, including toilets, hallways and rooms, is so untidy	• CAAB's lack of facility management awareness • CAAB's lack of instruction • Confirm specification sheet for CAAB consignment company	4-11
		Materials are piled up in front of airline offices	• Lack of CAAB's facility management awareness • CAAB's lack of instruction	4-12
		Bulky refuse, unused chairs and desks are piled in hallway corners	• Lack of CAAB's facility management awareness • CAAB's lack of instruction	4-13

Major item	Middle item	Current Situation & Issues	Cause Analysis	Issue Number
Facilities & Equipment	Current Situation of Facilities & Equipment	The spaces in front of check-in counters are cramped and often become congested	<ul style="list-style-type: none"> ▪Partly narrowed by the chair installed by CAAB ▪Lack of CAAB's facility management awareness ▪The fact that the counter loan fee is not taken also contributes to lack of consciousness 	4-14
Terminal Services				
Facilities & Equipment	Current Situation of Facilities & Equipment	There are only few information counters	▪There is no possibility of customer satisfaction in the first place	4-15
		Only one smoking area within the airport (public area)	▪There is a possibility that there is no concept of customer satisfaction in the first place	4-16
		Small number of customer feedback' boxes with negative names	▪There is no possibility of customer satisfaction in the first place	4-17
		No management of access to office areas, allowing anyone to come and go	▪Confirm whether access to restricted area from office area is necessary	4-18
		Utilization of the multilevel car park is low, and the interior is dark	<ul style="list-style-type: none"> ▪Confirm the management status of lighting ▪Check the parking lot on the front of the terminal and the amount difference etc. 	4-19
		Terminal entrances are congested with people and baggage during peak hours, overflowing onto the road and posing a real danger of an accident resulting in death or injury.	▪Lack of awareness of service level improvement	4-20
		No drinking water available in gate lounges	▪Lack of awareness of service level improvement	4-21
Operation & Maintenance	Current Situation of Operation	Rubbish and unused carts, desks, chairs and stanchions are scattered	<ul style="list-style-type: none"> ▪Lack of CAAB's facility management awareness ▪CAAB's lack of instruction ▪Confirm the contents of consignment from CAAB to a cleaning contractor 	4-22
		Rubbish bins overflow with waste on the arrival lobby	<ul style="list-style-type: none"> ▪Lack of CAAB's facility management awareness ▪CAAB's lack of instruction ▪Confirm specification sheet from CAAB to cleaning contractor 	4-23
		Garbage is scattered in lost baggage storage room	<ul style="list-style-type: none"> ▪Lack of CAAB's facility management awareness ▪CAAB's lack of instruction ▪Confirm specification sheet from CAAB to cleaning contractor 	4-24
		Roof leaks where Terminals 1 and 2 joins.	▪Lack of awareness of service level improvement	4-25
		Too many animals and insects in the terminals (dogs, cats, mice and mosquitoes).	▪Lack of awareness of service level improvement	4-26

Source: JICA Study Team

5.7 Terminal Facility Maintenance and Management

5.7.1 Issues

The issues regarding terminal facilities maintenance and management are shown below;

- ➔ Although this was the first survey, the state of maintenance and management did not appear as bad as envisioned, as passenger areas seem to be thoroughly managed and maintained. The next survey will be conducted in June, following Ramadan. In addition to improvement suggestions, the JICA Study Team will survey identified areas that require further investigation. The survey will focus particularly on the state of the manuals (systematic maintenance of manuals), as well as determining whether maintenance and management are being conducted in a planned manner.
- ➔ Although there is awareness in improving passenger areas, including plans to install digital displays above all check-in counters next month, the cleaning and organization of other less-visible areas, such as machinery rooms, has been neglected and shows no indication of improvement.
- ➔ The terminals were extremely dirty five years ago, and passenger areas have greatly improved in the last 2 to 3 years (staff areas and other less-visible locations remain unclean).



Photo 5.7-1 Scheduled to install digital signage at all booths



Photo 5.7-2 Cleaning in the terminal

- ➔ Realistically, it is considered difficult to implement drastic improvements or adopt new systems at Terminals 1 and 2. It would be advisable to first introduce new systems or major improvements in the new Terminal 3 facility.
- ➔ Without determining the handling (demarcation) of Terminals 1 and 2 following the opening of Terminal 3, it is considered difficult to judge whether investing on the improvement of these two terminals is appropriate. A prompt decision in the handling (demarcation) of Terminals 1 and 2 following the opening of Terminal 3 will be important.
- ➔ The JICA Study Team would like to explore possible low-cost improvements to the present state of Terminals 1 and 2 in order to boost operating, maintenance, and management capabilities, such as reviewing the management of tools, supplies, and wiring and establishing a centralized maintenance management that negates individual differences in levels (creating maintenance check sheets, etc.).
- ➔ Normally, the airlines using Terminal 3 would be determined from the design stage. Basing construction on specifications which incorporate the requests of airlines that will actually use the terminal makes it possible to minimize reworking and additions. Discussions with the airlines that will actually use the terminal are indispensable. As such, the CAAB should first explain the details of the facility and begin discussions with the airlines.

- Terminal 3 should also have new equipment, a review of operating systems, and new manuals. Familiarization training and relocation before the start-up and commissioning will be required. There is also a need to confirm the degree of understanding and capability with respect to the start-up and commissioning work of the CAAB.

5.7.2 Cause Analysis

The issues and its cause regarding terminal facilities maintenance and management are shown in Table 5.7-1.

Table 5.7-1 Cause Analysis_ Terminal Facilities Maintenance and Management

Large Category	Sub Entry	Current Situation & Issues	Cause Analysis	Issue Number
Passenger Terminal (Facilities & Equipment)				
Facilities & Equipment	Current Situation of Facilities & Equipment	As there are no signs in the departure and arrival lobbies indicating their layouts, passengers do not know where things are located	<ul style="list-style-type: none"> ▪ Lack of consciousness toward improving service level ▪ Lack of facility maintenance at passenger level ▪ It seems that it is not a financial issue of CAAB (CAAB is not in financial trouble) 	5-1
		Departure lobby check-in counter signs not prominent. Passengers do not know which check-in counter to approach	<ul style="list-style-type: none"> ▪ Lack of consciousness toward improving service level ▪ Lack of facility maintenance at passenger level 	5-2
		Departure lobby FIDS screen is small and difficult to see	<ul style="list-style-type: none"> ▪ Lack of consciousness toward improving service level ▪ Lack of facility maintenance at passenger level 	5-3
		Inadequate information for transfers between domestic and international passenger terminals	<ul style="list-style-type: none"> ▪ Lack of consciousness toward improving service level ▪ Lack of facility maintenance at passenger level ▪ It seems that it is not a financial issue of CAAB (CAAB is not in financial trouble) 	5-4
Operation & Maintenance	Inspection status	A check of the passenger terminal electrical utility rooms revealed that they were littered with rubbish and wiring was disorganized (48 electrical rooms at HSIA)	<ul style="list-style-type: none"> ▪ Lack of facility management awareness 	5-5
		Tools, etc. in sorting areas are not managed properly and waste materials are also scattered around	<ul style="list-style-type: none"> ▪ Lack of facility management awareness ▪ CAAB's lack of instruction 	5-6
Operation & Maintenance	Current Situation of Facilities & Equipment	Exposed wiring in office area hallways	<ul style="list-style-type: none"> ▪ Lack of facility management awareness 	5-7
Passenger Terminal (Operation & Maintenance)				
Operation & Maintenance	Manual maintenance status	Maintenance check sheets for staff in charge of lighting are written by hand in notebooks, making it impossible to imagine that standardized maintenance and management are being performed	<ul style="list-style-type: none"> ▪ Inadequate manual and check sheet 	5-8

Large Category	Sub Entry	Current Situation & Issues	Cause Analysis	Issue Number
Facilities & Equipment	Storage status of spare parts	Spare fluorescent lights have been placed in the Combined Complain Center, with no indication of inventory management	<ul style="list-style-type: none"> Lack of facility management awareness 	5-9
Curbside				
Facilities & Equipment	Current Situation of Facilities & Equipment	No airline signage installed at departure curbside, so passengers do not know where to alight	<ul style="list-style-type: none"> Lack of consciousness toward improving service level Lack of facility maintenance at passenger level It seems that it is not a financial issue of CAAB (CAAB is not in financial trouble) 	5-10
		Taxis, buses and general vehicles intermingle at both the departure and arrival floors; in addition, no taxi pools exist, making the curbside seem congested and unmanaged	<ul style="list-style-type: none"> Lack of consciousness toward improving service level Lack of facility maintenance at passenger level 	5-11
		At the departure curbside, there are two steps leading from the road up the departure lobby	<ul style="list-style-type: none"> Lack of facility maintenance awareness at the passenger's eyes To UD (Universal Design), consciousness has not yet been fostered 	5-12
Operation & Maintenance	Inspection status	Rubbish is strewn throughout the cargo area as a whole	<ul style="list-style-type: none"> Lack of facility management awareness CAAB's lack of instruction The awareness of ES (Employee Satisfaction) has not yet been fostered 	5-13
		Toilets for the exclusive use of staff are extremely dirty	<ul style="list-style-type: none"> Lack of facility management awareness CAAB's lack of instruction Against ES (Employee Satisfaction). Consciousness has not yet been fostered 	5-14

Source: JICA Study Team

5.8 Departure and Arrival Immigration, Customs

5.8.1 Departure and Arrival Immigration

(1) Personnel

Personnel shortage is caused by working conditions including wage level. Position changing policy at immigration control office for fraud prevention hinders immigration inspection officer from acquiring skills required for immigration control work.

(2) Facility

The departure inspection area at the Immigration Hall is narrow and crowded. At the peak hour, passengers are forced to wait the outside the departure inspection area.

(3) Equipment

the Personal Computer used in immigration control office runs "Windows XP". As support for WindowsXP is terminated, security is vulnerable.

(4) Immigration

Inspecting Bangladeshi passengers with departure documents filled in incompletely, immigration officers have to spend extra time helping them filling in the cards.

5.8.2 Customs

Insufficient personnel in Customs because of Work Conditions including wages.

5.8.3 Cause Analysis

Issues and Cause Analysis of Customs is shown as Table 5.8-1

Table 5.8-1 Issues and Cause Analysis of Customs

Large Category	Sub Entry	Issues	Cause Analysis	Issues Number
Organization Structure	Personnel	Insufficient personnel in Immigration	<ul style="list-style-type: none"> Personnel structure Business contents of each department 	6-1
		Position changing policy at immigration control office for fraud prevention hinders immigration inspection officer from acquiring skills required for immigration control work.	<ul style="list-style-type: none"> Personnel structure Business contents of each department Lack of initiative 	6-2
		Insufficient personnel in Customs	<ul style="list-style-type: none"> Personnel structure Business contents of each department 	6-3
Human Error	<ul style="list-style-type: none"> Issues of Staff ability Staff allocation Communication issues 	There are many Bangladeshi passengers who have incomplete entry of departure documents in immigration control and it takes unnecessary time for the review.	<ul style="list-style-type: none"> Lack of education and training Work process unfinished / Work process not updated Inadequate understanding of instruction content Confirmation of departure documents is not carried out 	6-4
Facility and Equipment	Facility	The immigration area is narrow and crowded.	<ul style="list-style-type: none"> At the peak hour, passenger are overflowing at the immigration area. 	6-5
	Equipment	the Personal Computer used in immigration control office runs "Windows XP".	<ul style="list-style-type: none"> As support for Windows XP is terminated, security is vulnerable. 	6-6

Source: JICA Study Team

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Chapter 6 Proposing Improvement Plan

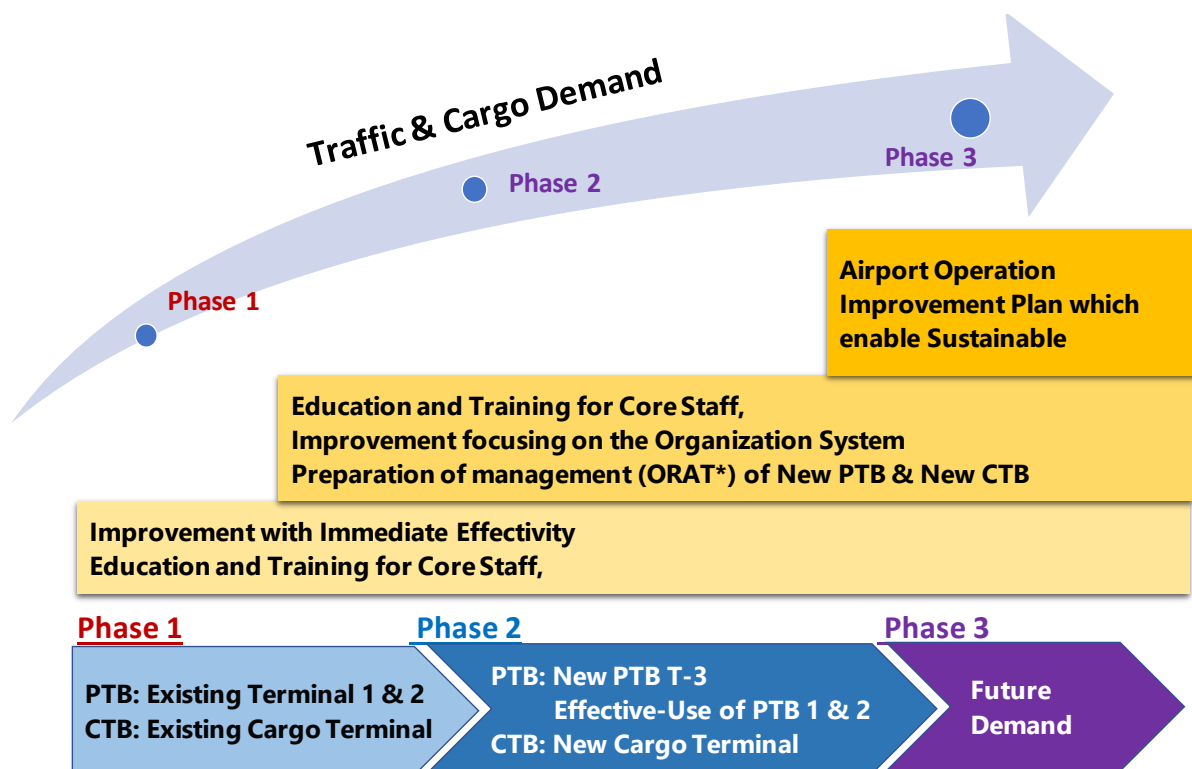
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CHAPTER 6 PROPOSING AN IMPROVEMENT PLAN

6.1 Outline

The improvement proposals will be given in this chapter regarding the result of the study and its consideration through 5 chapters. The phase planning concept of operation improvement is shown in Figure 6.1-1.

The improvement plan will be conducted step-by-step by deviding the plan into 3 phases regarding the targets. The phase 1 is targetting the exisiting facilities. Within the phase 1, priority improvement proposals are classified into phase1-1 and the improvement proposals with lower priority but still necessary for improving the airport operation is classified into phase1-2. Furthermore, the improvement proposals which need technical cooporation were considered in section 6.2.3 as a capacity building project. The phase 2 is targetting the passenger terminal 3 and new cargo terminal. Lastly, the phase 3 (future phase) is targetting improvement proposals regarding the operation organization which will be needed in stage when the new passenger terminla 3 and new cargo terminal starts operating.



Source: JICA Study Team

Figure 6.1-1 Phase Planning Concept of Operation Improvement

6.2 Operational Improvement of Existing Facilities (Phase 1)

6.2.1 Priority Improvement Proposal (Phase 1-1: PH1-1)

(1) Outline

Table 6.2-1 shows the list of priority improvement proposals (phase 1-1). The specific details are explained in the next section.

Table 6.2-1 Priority Improvement Proposals (Phase1-1)

	No	Title of the Improvement Proposal	Issue	Issue No
Passenger Service	PH1-1-P1	Reduce absenteeism for Biman Airlines Casual Staff and secure personnel for Hajj handling	Absenteeism in Casual Staff is causing many people shortages. In addition, during the Hajj period, a large number of temporary flights are handled, so that personnel shortage becomes more prominent.	1-3 1-5
	PH1-1-P2	Improve wheelchair handling at Remote Spot	In the case of Remote Spot, Ambulance Lift is not assigned, there are instances where the wheelchair is lifted and lowered stably with human power and there is not much danger.	1-11
	PH1-1-P3	Improvement of assignment method of check-in counters	Gate assignment is late and cannot be directed to passengers (gate cannot be guided at check-in). As a result, the gate opening is delayed, and the gate security check start is delayed.	1-18 1-19 2-16
	PH1-1-P4	Improvement of assignment method of check-in counters	Securing the check-in counter is a quick win, and each airline has suffered since it is in a normal state, such as "counter opening is delayed", "place is not fixed".	1-17
	PH1-1-P5	Improve maintenance and repair of check-in counters	Row C's CUTE (SITA) has not been repaired. As a result, it is monopolized by US-Bangla Airlines and Regent Airways brought in their own systems. Also, scratches have occurred at the check-in counters, and paint is peeling in some places.	1-20 1-25
Ramp Service	PH1-1-R1	Improvement of GSE failure ratio	Shortage of GSE equipment and high unserviceable ratio	2-4, 2-5, 2-6, 2-19
	PH1-1-R2	Improvement of ramp safety	Inappropriate GSE handling and maintenance at the ramp area	2-8, 2-9, 2-10, 2-11, 2-15, 2-20
	PH1-1-R3	Improvement of ramp service quality	Low quality by inappropriate handling	1-12, 1-14, 2-7, 2-12, 2-13, 2-21
	PH1-1-R4	Improvement of Biman Airlines handling structure by sufficient staffing	Lack of staffing is not only affecting Biman Airlines flight handling but also foreign customer airlines' flight handling.	1-1, 1-2, 1-6, 2-2, 2-4
	PH1-1-R5	Improvement of handling capability of Biman Airlines and OTP	Lack of staffing is not only affecting Biman Airlines flight handling but also foreign customer airlines' flight handling. Insufficient handling capability causes further delay and lowering OTP.	1-4, 1-7, 2-1, 2-3
	PH1-1-R6	Passenger Boarding Bridge (PBB) Operation Skill Improvement	There are variations in the operation skills of the PBB operator, which takes time.	2-14
Cargo Handling	PH1-1-C1	To decrease the number of accidents in Export and Import Warehouse (SAFETY)	Insufficient in basic training to cargo staff. There is no supervisory staff on site. Lack of awareness for safety handling complied with SOP.	3-1~5, 3-11~20, 3-25~28, 3-31, 3-35~37
	PH1-1-C2	To decrease the number of lost and damage of cargo in Import Warehouse (QUALITY)	Insufficient in basic training to cargo staff. There is no supervisory staff on site. Lack of awareness for safety handling complied with SOP.	3-1~7, 3-11~20, 3-25~28, 3-31, 3-34~37
	PH1-1-C3	To shorten the average required time from warehouse IN to OUT (EFFICIENCY)	Insufficient in basic training to cargo staff. There is no supervisory staff on site. Lack of awareness for safety handling complied with SOP.	3-1~7, 3-11~20, 3-22~28, 3-30~37
	PH1-1-C4	Improvement of Customs Clearance Processing Time	Shortage of frontline Customs officer Opening hours are usually late and long lunch rest	3-8~10, 3-38

Source: JICA Study Team

(2) Passenger Service

Regarding improvement proposals on passenger service, items with relatively high urgency (Phase 1-1) are summarized in Table 6.2-2~Table 6.2-6.

Table 6.2-2 Improvement Proposal-PH1-1-P1

Title	Reduce absenteeism for Biman Airlines Casual Staff and Secure Personnel for Hajj Handling
Issues	1-3, 1-5 Absenteeism in Casual Staff is causing many people shortages. In addition, during the Hajj period, a large number of temporary flights are handled, so that personnel shortage becomes more prominent.
Cause Analysis	<ul style="list-style-type: none"> • Personnel structure • Estimate necessary number of staff • Business contents of each department • Motivation of Staff • Form of employment, Moral, Wages • Biman Airlines has about 50 staff dedicated to handle the Hajj flight during the Hajj period, causing staffing shortage for other flight.
Objective	Implementation of stable handling
Allocated To	Biman Airlines
Method	<ul style="list-style-type: none"> • Determine and calculate the necessary number of staff required for handling • Review the scope of work of each department • Continued recruitment • Improve staff motivation and morality • Reconsider employment conditions and wages • Secure personnel during Hajj period

Source: JICA Study Team

Table 6.2-3 Improvement Proposal-PH1-1-P2

Title	Improve Wheelchair Handling at Remote Spot
Issues	1-11 In the case of remote spot, ambulance lift is not assigned, there are instances where the wheelchair is lifted and lowered stably with human power and there is not much danger.
Cause Analysis	<ul style="list-style-type: none"> • Personnel structure • Business contents of each department • Number of Ambulance Lift (2 units), how to assign
Objective	Always carry out handling using Ambulance Lift to prevent injury to passengers and staff.
Allocated To	Biman Airlines
Method	<ul style="list-style-type: none"> • Required personnel placement • Implementation of education and training that can comply with standards • Maintenance of manual / SOP • Thorough compliance with standards • Placement of required equipment (Ambulance Lift)

Source: JICA Study Team

Table 6.2-4 Improvement Proposal-PH1-1-P3

Title	Improvement of Assignment Method of Check-in Counters
Issues	1-18, 1-19, 2-16 Gate assignment is late and cannot be directed to passengers (gate cannot be guided at check-in). As a result, the gate opening is delayed, and the gate security check start is delayed.
Cause Analysis	<ul style="list-style-type: none"> • Discrepancy between actual work and manual • There is no accurate instruction • Inadequate understanding of instruction content • There is no basic assignment table. Although "first come, first serve" is the principle, there are many departure delays, with balls, the arrival flight gate assignment is delayed behind. • Gate Assignment is Slow
Objective	Gate assignment is done at an early stage, implementation of gate open and security check is also advanced, and OTP is improved.
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Creation of basic assignment table according to time table • Maintenance of manual/SOP • Review and review the scope of work of each department

Source: JICA Study Team

Table 6.2-5 Improvement Proposal-PH1-1-P4

Title	Improvement of Assignment Method of Check-in Counters
Issues	1-17 Securing the check-in counter is a quick win, and each airline has suffered since it is in a normal state, such as "counter opening is delayed", "place is not fixed. "
Cause Analysis	<ul style="list-style-type: none"> • Discrepancy between actual work and manual • There is no accurate instruction • Inadequate understanding of instruction content • There is no basic assignment table
Objective	Always allow scheduled opening of the check-in counter according to the assignment table
Allocated To	CAAB, AOC
Method	<ul style="list-style-type: none"> • Creation of basic assignment table according to time table • Outsource creation and daily operation to AOC. • Repair of incidental equipment • Maintenance of manual/SOP

Source: JICA Study Team

Table 6.2-6 Improvement Proposal-PH1-1-P5

Title	Improve Maintenance and Repair of Check-in Counters
Issues	1-20, 1-25 Row C's CUTE (SITA) has not been repaired. As a result, it is monopolized by US-Bangla Airlines and Regent Airways brought in their own systems. Also, scratches have occurred at the check-in counters, and paint is peeling in some places.
Cause Analysis	<ul style="list-style-type: none"> • Correspondence situation at the time of failure • Maintenance inspection is not carried out reliably • Current condition of Facility and Equipment • Update status of facility equipment
Objective	With repair of CUTE (SITA), the number of counter for each company is expanded, and convenience is improved. In addition, comfort is improved by maintenance and management of appropriate facilities.
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Formulation of terminal maintenance plan • CUTE (SITA) Immediate response at the occurrence of failure and improvement of repair technology • CUTE (SITA) Perform periodic maintenance inspection • Implementation of periodic maintenance inspection of facility • Maintenance of repair facilities / Maintenance of SOP

Source: JICA Study Team

(3) Ramp Service

Regarding improvement proposals on ramp service, items with relatively high urgency (Phase 1-1) are summarized in Table 6.2-7~Table 6.2-12.

Table 6.2-7 Improvement Proposal-PH1-1-R1

Title	Improvement of GSE Failure Ratio
Issues	2-4, 2-5, 2-6, 2-19 Shortage of GSE equipment and high unserviceable ratio
Cause Analysis	<ul style="list-style-type: none"> • Personnel Structure • The scope of work of each department • Effect of equipment Shortage • Motivation and Morale of staff • Status of periodic inspection and daily inspection. • Update status of facility equipment
Objective	Proper Operation and maintenance of GSE
Allocated to	Biman Airlines
Method	<ul style="list-style-type: none"> • Continue recruitment • Estimate the staffing requirement for GSE maintenance • Review the scope of work of each department • Review necessary equipment and replenish it. • Maintain The GSE regularly in accordance the maintenance plan. • Improve staff motivation and morality

Source: JICA Study Team

Table 6.2-8 Improvement Proposal-PH1-1-R2

Title	Improvement of Ramp Safety
Issues	2-8, 2-9, 2-10, 2-11, 2-15, 2-20 Inappropriate GSE handling and maintenance at the ramp area
Cause Analysis	<ul style="list-style-type: none"> • Lack of education • Lack of dissemination of instruction and work knowledge to the staff • Discrepancy between actual work and work required by the manual • There is no Safety Management System. • There is no periodical cleaning because of no awareness of cleanness • Update status of facility equipment • Lack of management staff
Objective	Implementation of safe ramp handling
Allocated to	Biman Airlines
Method	<ul style="list-style-type: none"> • Implement education on safety and quality management • Review the handling manual • Build Safety Management System and build PDCA cycle. • Implement organizing ramp area and container yard for tidy equipment storage • Review required equipment and replenishment them regularly • Train the staff for future management position

Source: JICA Study Team

Table 6.2-9 Improvement Proposal-PH1-1-R3

Title	Improvement of Ramp Service Quality
Issues	1-12, 1-14, 2-7, 2-12, 2-13, 2-21 Low quality by inappropriate handling
Cause Analysis	<ul style="list-style-type: none"> • Lack of education • Lack of dissemination of instruction and work knowledge to employees • Discrepancy between actual work and work required under the manual • work process is not updated • Lack of equipment, facility and personnel • There is no Safety Management System
Objective	Implementation of high-quality ramp handling
Allocated to	Biman Airlines
Method	<ul style="list-style-type: none"> • Implement education on the ramp safety and service quality • Review the manual and work process • Build Safety Management System and build PDCA cycle. • Set up baggage cart management system(for collection and storage)

Source: JICA Study Team

Table 6.2-10 Improvement Proposal-PH1-1-R4

Title	Improvement of Biman Airlines Handling Structure by Sufficient Staffing
Issues	1-1, 1-2, 1-6, 2-3, 2-4 Lack of staffing is not only affecting Biman Airlines flight handling but also foreign customer airlines' flight handling.
Cause Analysis	<ul style="list-style-type: none"> • Personnel structure • Lack of personnel • estimate necessary personnel • Scope of works for each department • Manual and work process are not updated • The number of staff which provide for foreign customer airlines.
Objective	Implementation of appropriate handling by sufficient personnel
Allocated to	Biman Airlines
Method	<ul style="list-style-type: none"> • Continue recruitment • Determine and calculate the necessary number of staff • Review the scope of work of each department • Review the manual and work process • Calculate the staffing requirement for flight handling for foreign customer airlines and maintain the requirement

Source: JICA Study Team

Table 6.2-11 Improvement Proposal-PH1-1-R5

Title	Improvement of Handling Capability of Biman Airlines and OTP
Issues	1-4, 1-7, 2-1, 2-3 Lack of staffing is not only affecting Biman Airlines flight handling but also foreign customer airlines' flight handling. Insufficient handling capability causes further delay and lowering OTP.
Cause Analysis	<ul style="list-style-type: none"> • Personnel structure • Scope of work of each department • Lack of education • Personnel structure with present handling capability is not capable of handling flight during the peak hours. • The necessary staff are not provided for foreign customer airlines flight handling due to staffing shortage.
Objective	Improve ground handling capability which can handle flight during the peak hours and improve OTP
Allocated to	Biman Airlines
Method	<ul style="list-style-type: none"> • Continue recruitment • Determine and calculate the necessary number of staff • Review the scope of work of each department • Implement staff education • Review the manual and work process • Calculate the staffing requirement for foreign customer airlines' handling and maintain the required staffing.

Source: JICA Study Team

Table 6.2-12 Improvement Proposal-PH1-1-R6

Title	Passenger Boarding Bridge (PBB) Operation Skill Improvement
Issues	2-14 There are variations in the operation skills of the PBB operator, which takes time.
Cause Analysis	<ul style="list-style-type: none"> • Lack of education and training • There is no skill improvement measure
Objective	By improving PBB operation skill, contact risk with aircraft is reduced and safety is improved. Also, passenger's descent time is accelerated, and customer satisfaction is improved.
Allocated to	CAAB
Method	<ul style="list-style-type: none"> • Implementation of training on operation skills • Maintenance of manual / SOP

Source: JICA Study Team

(4) Cargo Handling

Regarding improvement proposals on cargo handling in present facilities, items with relatively high urgency (Phase 1) are summarized in Table 6.2-13 ~ Table 6.2-16. Items are thought to be improvement of safety, quality and efficiency in Export and Import Warehouse and the Customs clearing work.

1) Safety

To propose comprehensive measures to reduce the number of accidents in the Export and Import Warehouse because 74 times accidents occurred in the warehouse in the past five years (Source: Biman Airlines) and lack of consideration of safety handlings are observed during JICA survey.

2) Quality

To propose comprehensive measures such as to allocate instructors who pervade basic cargo handling rules to cargo staff because missing cargo is reported several times by Japanese forwarders in work area where is not organized for efficient work.

3) Efficiency

To propose comprehensive measures to improve work environment, education and training of cargo staff because the processing speed of cargo handlings are mostly late compare to Japan.

4) Required Time for Customs Clearance

To propose Customs office to develop and allocate necessary number of revenue officers appropriate to on-site workload and open office in conformity with officially announced office hours because those issues are pointed out by airport users

Table 6.2-13 Improvement Proposal-PH1-1-C1

Title	To Decrease the Number of Accidents in Export and Import Warehouse (SAFETY)
Issues	3-1~5, 3-11~20, 3-25~28, 3-31, 3-35~37 Insufficient in basic training to cargo staff. There is no supervisory staff on site. Lack of awareness for safety handling complied with SOP.
Cause Analysis	<ul style="list-style-type: none"> • Shortage of basic training to cargo staff on site • Safety is not properly secured when high-pallet is built up due to lack of knowledge in safety handling • A lot of part-timers to whom training is not sufficient • Frontline instructors are not trained up • Communication centered to some particular persons in which information and knowledge sharing is not enough • Unless boss instructs, cargo staff is not immobile • Handling in very congested Common area in Export Warehouse and Import Warehouse • The accident occurrence risk during transport of cargo increases if remote aircraft parking is assigned for cargo freighter • Scanning machines and equipment are not maintained properly which accelerates congestion and be a cause of accidents • Transit cargo is left in the ramp because there is no designated storage area which has a problem of safety operation of the aircraft
Objective	• Cargo stake holders share the awareness to enhance safety and build up a structure to implement the measures
Allocated to	Object: Biman Airlines Cargo Terminal Meeting Participant: CAAB, Biman Airlines (CEO & related department)
Method	<ul style="list-style-type: none"> • To form Improvement Plan Project Team sharing the direction where everyone is going by breaking down the boundaries of organization and the hierarchy • To make the awareness of safety, quality and efficiency well known to cargo staff by upgrading the practical SOP on day to day basis • To draw up curriculum for basic practice that supervisor is able to instruct cargo staff according to Manuals • To push up the comprehensive handling level of cargo staff by the instruction of the supervisors who were educated it in Japan • To review cargo flow of Export and Import Warehouse and develop a routine of organized floor

Source: JICA Study Team

Table 6.2-14 Improvement Proposal-PH1-1-C2

Title	To Decrease the Number of Lost and Damage of Cargo in Import Warehouse (QUALITY)
Issues	3-1~7, 3-11~20, 3-25~28, 3-31, 3-34~37 Insufficient in basic training to cargo staff. There is no supervisory staff on site. Lack of awareness for quality control complied with SOP.
Cause Analysis	<ul style="list-style-type: none"> • Shortage of basic training to cargo staff on site • There is no designated storage area for ULD and cargo • A lot of part-timers to whom training is not sufficient • High skilled frontline instructors are not trained up • Communication centered to some particular persons in which information and knowledge sharing is not enough • Unless boss instructs, cargo staff is not immobile • Handling in very congested Common area in Export Warehouse and Import Warehouse • The accident occurrence risk during transport of cargo increases if remote aircraft parking is assigned for cargo freighter • Scanning machines and equipment are not maintained properly which accelerates congestion and be a cause of accidents • Transit cargo is left in the ramp because there is no designated storage area which has a problem of safety operation of the aircraft
Objective	• Cargo stake holders share the awareness to enhance safety and build up a structure to implement the measures
Allocated to	Object: Biman Airlines Cargo Terminal Meeting Participant: CAAB, Biman Airlines (CEO & related department)
Method	<ul style="list-style-type: none"> • To form Improvement Plan Project Team sharing the direction where everyone is going by breaking down the boundaries of organization and the hierarchy • To make the awareness of safety, quality and efficiency well known to cargo staff by upgrading the practical SOP on day to day basis • To draw up curriculum for basic practice that supervisor is able to instruct cargo staff according to Manuals • To push up the comprehensive handling level of cargo staff by the instruction of the supervisors who were educated it in Japan • To review and replenish the number and type of equipment and facility for efficient work • To review cargo flow of Export and Import Warehouse and develop a routine of organized floor

Source: JICA Study Team

Table 6.2-15 Improvement Proposal-PH1-1-C3

Title	To shorten the Average Required Time from Warehouse IN to OUT (EFFICIENCY)
Issues	3-1~7, 3-11~20, 3-22~23, 3-25-28, 3-30~31, 3-34~37 Insufficient in basic training to cargo staff. There is no supervisory staff on site. Lack of awareness forefficient handling complied with SOP.
Cause Analysis	<ul style="list-style-type: none"> • Shortage of basic training to cargo staff on site • There is no designated storage area for ULD/cargo and floor is not organized for efficient work • A lot of part-timers to whom training is not sufficient • High skilled frontline instructors are not trained up • Communication centered to some particular persons in which information and knowledge sharing is not enough • Unless boss instructs, cargo staff is not immobile • Handling in very congested Common area in Export Warehouse and Import Warehouse • The accident occurrence risk during transport of cargo increases if remote aircraft parking is assigned for cargo freighter • Scanning machines and equipment are not maintained properly which accelerates congestion and be a cause of accidents • The number and type of necessary GSE for frontline job is not assessed properly • Transit cargo is left in the ramp because there is no designated storage area which has a problem of safety operation of the aircraft
Objective	• Cargo stake holders share the awareness to enhance safety and build up a structure to implement the measures
Allocated to	Object: Biman Airlines Cargo Terminal Meeting Participant: CAAB, Biman Airlines (CEO & related department)
Method	<ul style="list-style-type: none"> • To form Improvement Plan Project Team sharing the direction where everyone is going by breaking down the boundaries of organization and the hierarchy • To make the awareness of safety, quality and efficiency well known to cargo staff by upgrading the practical SOP on day to day basis • To draw up curriculum for basic practice that supervisor is able to instruct cargo staff according to Manuals • To push up the comprehensive handling level of cargo staff by the instruction of the supervisors who were educated it in Japan • to review and replenish the number and type of equipment and facility for efficient work • To review cargo flow of Export and Import Warehouse and develop a routine of organized floor

Source: JICA Study Team

Table 6.2-16 Improvement Proposal-PH1-1-C4

Title	Improve Required Time for Customs Clearance
Issue	3-8~10, 3-38 It takes a really long time for Customs clearance compare to other countries
Cause Analysis	<ul style="list-style-type: none"> • Shortage of training to Revenue Officers on site for the Customs work • Shortage of Customs officers on site • Customs opens around 10 am and takes long lunch break, consequently working hours are less than 6 hours
Objective	• Customs office improves capacity to clear Customs and facilitate cargo moving out of Import Warehouse and ease congestion there
Allocated to	Customs Officer
Method	<ul style="list-style-type: none"> • To cultivate Customs officers to be allocated to frontline • To allocate necessary number of Customs officers on site appropriate to real workload • To open and work Customs office in conformity to officialy announced office hours

Source: JICA Study Team

6.2.2 Other Proposal (Phase 1-2: PH1-2)

(1) Outline

Table 6.2-17 and Table 6.2-18 shows the list of improvement proposals (phase 1-2) with lower priority but still necessary for improving the existing operation. The specific details are explained in the next section.

Table 6.2-17 Improvement Proposal Phase 1-2 (1/2)

	No	Title of the Improvement Proposal	Issue	Issue No
Passenger Service	PH1-2-P1	Congestion relaxation of terminal entrance security	Terminal entrance security is heavily congested since only 4 out of 6 places are open. Because the entrance for business class is also closed, priority service cannot be provided.	1-8 1-9
	PH1-2-P2	Improvement of Check-in Service of Biman Airlines	The following three points were seen as examples showing the low service level. Guide to passengers is hard to understand. Staff eat and drink at the counter. I have kept passengers waiting for a long time.	1-15 1-16
	PH1-2-P3	Congestion relaxation at check-in counter	There is not enough check-in counter, it is narrow and crowded. Especially the left side of Row D is narrow, passenger crowd is heavy. The display of the check-in counter is also difficult to understand.	1-22 1-23 1-24
	PH1-2-P4	Improvement of maintenance of Passenger Boarding Bridge (PBB)	Auto-adjustor function of PBB does not work properly. Because there is a hole in the PBB canopy, a lot of mosquitoes invade into the plane from there. There was a case that Malaysia Airlines flight was delayed 2 hours	2-17 2-18
	PH1-2-P5	Improvement of dealing with lost and found	When accident baggage occurs, PIRs are issued to passengers, but there are cases where they are not issued.	1-13
	PH1-2-P6	Improve response capability in case of BHS failure	In some cases, baggage belt halted for half a day due to BHS failure, handling baggage with human wave tactics.	1-21
	PH1-2-P7	Implement appropriate preparation of baggage cart on arrival turntable	A baggage cart is prepared in the vicinity of the arrival turntable, but an appropriate replenishment is not made, and the passenger is taking the cart pool. Also, it is difficult to understand the location of the cart pool.	1-10
Passenger Management	PH1-2-T1	Improvement of tenant management, organization and Work contents for each department	There are no leasing activities and no marketing data for that purpose. No encouragement for improvements to product lineup and customer relations, etc. No sales promotion activities undertaken. No full-time staff at the airport.	4-1 4-2 4-7 4-8
	PH1-2-T2	Increasing the number of restaurant	Not enough restaurants	4-3
	PH1-2-T3	Introducing global tenants	No global retail or duty-free tenants	4-4
	PH1-2-T4	Introducing the sales percentages system	Rents are set on the basis of floor space rather than sales volume	4-5
	PH1-2-T5	Introducing the management system of sales percentages	No knowledge of sales revenue	4-6
	PH1-2-T6	Ease the congestion of the space in front of the check-in counter	Congestion due to inadequate space in front of check-in counters	4-9 4-10
	PH1-2-T7	Arrange the space in front of the counters	Stanchions and seating class check-in displays are left in the spaces in front of the counters even when the counters are not in use.	4-10 4-11
	PH1-2-T8	Improve the cleaning of toilets	Cleaning is not done properly in toilets, corridors and offices	4-12
	PH1-2-T9	Arrange the space in front of the airlines office	Materials piled up in front of airline offices	4-13
	PH1-2-T10	Clean and arrange the office area	Discarded items and obsolete furniture piled up in corridor corners	4-14
	PH1-2-T11	Increase the number of information counter	Not enough information counters	4-15
	PH1-2-T12	Increase the number of smoking area	Only 1 smoking area	4-16
	PH1-2-T13	Increase the number of Ccomment box	Not enough customer feedback boxes and negative title given to boxes	4-17
	PH1-2-T14	Improve the access control	No control over entry and exit from office areas; anyone can gain access	4-18
	PH1-2-T15	Improve the confidence of car parking	Little use of multistory car park, interior dark	4-19
	PH1-2-T16	Improve the cleaning of terminal	Garbage and baggage carts abandoned in corners of the departure lobbies and in dead areas along passenger flow lines	4-22 4-23 4-24

Source: JICA Study Team

Table 6.2-18 Improvement Proposal Phase 1-2 (2/2)

	No	Title of the Improvement Proposal	Issue	Issue No
Terminal Facilities Maintenance	PH1-2-M1	Signage improvement (1)	No layout maps in departure or arrival lobbies so passengers don't know where anything is	5-1
	PH1-2-M2	Signage improvement (2)	Check-in counter signs in departure lobbies are difficult to understand and passengers do not know which check-in counter to go to	5-2 5-3
	PH1-2-M3	Improvement of curbside	Terminal entrances are congested with people and baggage during peak hours, overflowing onto the road and posing a real danger of an accident resulting in death or injury.	4-20
	PH1-2-M4	Improvement of transfer	Insufficient information on connections between domestic and international terminals	5-4
	PH1-2-M5	Improvement of electricity room	Wiring in the 48 electrical plant rooms in the passenger terminals is untidy and the rooms are littered with garbage	5-5
	PH1-2-M6	Improvement of environment at the office area	Wiring is exposed in office area corridors	5-6
	PH1-2-M7	Improvement of sorting area	Tools, etc. are not put away in the sorting areas and waste material also litter the areas	5-7 5-8
	PH1-2-M8	Improvement of signage at the curbside	There are no airline signs on the departure level curbside areas, so passengers don't know where to be dropped off	5-10
	PH1-2-M9	Improvement of traffic congestion at the curbside	Taxis, buses and private automobiles all use the same lanes on the departure and arrival levels and, in addition, there is no taxi pool. Therefore, curbside areas are congested and uncontrolled	5-11 4-20
	PH1-2-M10	Universal design at the curbside	At the departure curbside areas, passengers must negotiate two steps from the road to the departure lobby	5-12
	PH1-2-M11	Cleaving the cargo area	Garbage is scattered all over the cargo area	5-13
	PH1-2-M12	Cleaning the toilets at the office area	Toilets are used by staff only and are extremely dirty	5-14
	PH1-2-M13	Improvement of confidence at the gate lounge	No drinking water available in gate lounges	4-21
	PH1-2-M14	Repairing the roof for stopping the rain leak	Roof leaks where Terminals 1 and 2 joins.	4-25
	PH1-2-M15	Exterminating animals from the terminal building	Too many animals and insects in the terminals (dogs, cats, mice and mosquitoes).	4-26
	PH1-2-M16	Improvement of storage managing	Spare fluorescent lights have been placed in the Combined Complain Center, with no indication of inventory management	5-9
Immigration and Customs	PH1-2-Cu1	Improvement of personnel shortage in immigration	Personnel shortage in immigration	6-1
	PH1-2-Cu2	Expertise in immigration control work	Position changing policy at immigration control office for fraud prevention hinders immigration inspection officer from acquiring skills required for immigration control work.	6-2
	PH1-2-Cu3	Improvement of personnel shortage in Customs	Personnel shortage in Customs	6-3
	PH1-2-Cu4	Reduction of incomplete entry of departure documents	There are many Bangladeshi passengers who have incomplete entry of departure documents in immigration control and it takes unnecessary time for the review.	6-4
	PH1-2-Cu5	Congestion relief at departure immigration area	The departure immigration area is narrow and crowded.	6-5
	PH1-2-Cu6	Update PC	the Personal Computer used in immigration control office runs "Windows XP".	6-6

Source: JICA Study Team

(2) Passenger Service

Regarding improvement proposals on passenger service, items with relatively low urgency (Phase1-2) are summarized in Table 6.2-19 ~Table 6.2-25.

Table 6.2-19 Improvement Proposal-PH1-2-P1

Title	Congestion Relaxation of Terminal Entrance Security
Issues	1-8, 1-9 Terminal entrance Security is heavily congested since only 4 out of 6 places are open. Because the entrance for business class is also closed, Priority Service cannot be provided.
Cause Analysis	<ul style="list-style-type: none"> • Inspector staff shortage • Personnel structure • Business contents of each department
Objective	Improve convenience and comfort by alleviating congestion
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Eliminate personnel shortage of inspectors by adoption • Determine and calculate the necessary number of staff • Reconsider employment conditions and improve motivation of staff.

Source: JICA Study Team

Table 6.2-20 Improvement Proposal-PH1-2-P2

Title	Improvement of Check-in Service of Biman Airlines
Issues	1-15, 1-16 The following three points were seen as examples showing the low service level. Guide to passengers is hard to understand. Staff eat and drink at the counter. I have kept passengers waiting for a long time.
Cause Analysis	<ul style="list-style-type: none"> • Lack of education and training • Discrepancy between actual work and manual • Work process unfinished / Work process not updated • There is no support by staff • Motivation • Work environment • Moral issues
Objective	Provide high quality check-in service by staff's support to passengers and improve customer satisfaction.
Allocated to	Biman Airlines
Method	<ul style="list-style-type: none"> • Formulate quality standards and conduct education and training based on that • Perform periodic quality checks and manage quality • Place staff to support passengers • Maintenance of manual / SOP • Show flight name / destination • Improve the motivation and morality of staff through reconsideration of employment conditions

Source: JICA Study Team

Table 6.2-21 Improvement Proposal-PH1-2-P3

Title	Congestion Relaxation at Check-in Counter
Issues	1-22, 1-23, 1-24 There is not enough check-in counter, it is narrow and crowded. Especially the left side of Row D is narrow, passenger crowd is heavy. The display of the check-in counter is also difficult to understand.
Cause Analysis	<ul style="list-style-type: none"> • Facility current condition • The number of counters is insufficient and check-in is carried out with few counters. • The depot of the departure document is attached to the pillar adjacent to the check-in counter, causing passengers to stagnate and become a cause of congestion. • The cart has been left behind, it is in the way. • Depending on the airline company, it is not restricted to enter the check-in counter. • Preservation status of spare parts • There is not enough standing pole to set up the waiting queue for passengers. Also, used carts are left untouched and left untouched. • The airline's indication is a hanging signboard, most of the flight number / destination is not displayed.
Objective	Convenience and comfort are improved by alleviating congestion at the check-in counter
Allocated To	CAAB, AOC, Biman Airlines
Method	<ul style="list-style-type: none"> • Place personnel, control waiting queue of passengers and clean up used carts. • Restrict access to the vicinity of the counter at the office. • Maintenance of manual / SOP • Reconsider the entry place of departure documents. • Implement additional deployment of stance poles. • Display additional flight number / destination in the check-in counter display

Source: JICA Study Team

Table 6.2-22 Improvement Proposal-PH1-2-P4

Title	Passenger Boarding Bridge (PBB) Operation Skill Improvement
Issues	2-17, 2-18 There are variations in the operation skills of the PBB operator, which takes time.
Cause Analysis	<ul style="list-style-type: none"> • Lack of education and training • There is no skill improvement measure
Objective	By improving PBB operation skill, contact risk with aircraft is reduced and safety is improved. Also, passenger's descent time is accelerated, and customer satisfaction is improved.
Allocated to	CAAB
Method	<ul style="list-style-type: none"> • Implementation of training on operation skills • Maintenance of manual / SOP

Source: JICA Study Team

Table 6.2-23 Improvement Proposal-PH1-2-P5

Title	Improvement of Dealing with Lost and Found
Issues	1-13 When accident baggage occurs, PIRs are issued to passengers, but there are cases where they are not issued.
Cause Analysis	<ul style="list-style-type: none"> • Lack of education and training • Discrepancy between actual work and manual • Not being thoroughly informed to staff
Objective	Compliance with the manual improves response capability and customer satisfaction.
Allocated to	Biman Airlines
Method	<ul style="list-style-type: none"> • Implementation of education and training that can comply with standards • Maintenance of manual / SOP • Thorough compliance with standards

Source: JICA Study Team

Table 6.2-24 Improvement Proposal-PH1-2-P6

Title	Improve Response Capability in case of BHS Failure
Issues	1-21 In some cases, BAG BELT halted for half a day due to BHS failure, handling baggage with human wave tactics.
Cause Analysis	<ul style="list-style-type: none"> • Correspondence situation at the time of failure of BHS • Maintenance inspection of BHS is not carried out reliably
Objective	Implementation of smooth baggage handling
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Rapid response at the occurrence of BHS failure and improvement of repair technology • Conduct periodic maintenance and inspection of BHS

Source: JICA Study Team

Table 6.2-25 Improvement Proposal-PH1-2-P7

Title	Implement Appropriate Preparation of Baggage Cart on Arrival Turntable
Issues	1-10 A Baggage cart is prepared in the vicinity of the arrival turntable, but an appropriate replenishment is not made, and the passenger is taking the cart pool. Also, it is difficult to understand the location of the cart pool.
Cause Analysis	<ul style="list-style-type: none"> • Personnel structure • Business contents of each department • Cart replenishment system, cart pool location guidance
Objective	Improve convenience and comfort by proper preparation of the cart
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Determine the necessary number of staff and calculate • Prepare necessary personnel structure • Review scope of work • Carry out cart pool guidance

Source: JICA Study Team

(3) Passenger Terminal Maintenance and Management

Regarding improvement proposals on passenger terminal maintenance and management, items with relatively low urgency (Phase1-2) are summarized in Table 6.2-26 ~ Table 6.2-41.

Table 6.2-26 Improvement Proposal-PH1-2-T1

Title		Improvement of Tenant Management, Organization and Work Contents for each Department
Issue -1	Issue	4-1 There are no leasing activities and no marketing data for that purpose
	Factor Analysis	<ul style="list-style-type: none"> • No motivation to attract interesting shops due to fixed rent system • Tenant selection is by public tender
	Objective	Attract and select interesting tenants
Issue -2	Issue	4-7 No encouragement for improvements to product lineup and customer relations, etc.
	Factor Analysis	<ul style="list-style-type: none"> • No interest in tenant sales due to fixed rent system • Thinking is that airports should not get involved in product line up
	Objective	Improve customer satisfaction by improving tenant revenue and customer relations
Issue -3	Issue	4-8 No sales promotion activities undertaken
	Factor Analysis	<ul style="list-style-type: none"> • Airport operator does not feel the need to promote sales due to fixed rent system • No knowledge of sales revenue so unable to analyze trends or consider effective improvement strategies
	Objective	Improve tenant sales through sales promotion campaigns
Issue -4	Issue	4-2 No full-time staff at the airport
	Factor Analysis	<ul style="list-style-type: none"> • Airport operator does not feel the need to proactively manage tenants due to the fixed rent system
	Objective	Improve day-to-day communications with tenants
Allocated To		CAAB
Method		<ul style="list-style-type: none"> • Convert fixed rent system to sales-based system so improved retail revenue leads to improved revenue for the airport company • Consolidate the organizational framework and build a system that can accommodate the full cycle including attracting and managing tenants and promoting sales

Source: JICA Study Team

Table 6.2-27 Improvement Proposal-PH1-2-T2

Title		Increasing the Number of Restaurant
Issue	4-3	Not enough restaurants
Factor Analysis		<ul style="list-style-type: none"> • Insufficient space inside the terminals
Objective		Increase revenue
Allocated To		CAAB
Method		<ul style="list-style-type: none"> • No improvement strategies due to CAAB decision to not provide new tenant space • More shops will come on line when Terminal 3 is commissioned

Source: JICA Study Team

Table 6.2-28 Improvement Proposal-PH1-2-T3

Title		Introducing Global Tenants
Issue	4-4	No global retail or duty-free tenants
Factor Analysis		No motivation to attract interesting shops due to fixed rent system
Objective		Introduce global tenants that offer shopping confidence and improve sales and customer satisfaction
Allocated To		CAAB
Method		<ul style="list-style-type: none"> • Convert fixed rent system to sales-based system so improved retail revenue leads to improved revenue for the airport company • Consolidate the organizational framework and build a system that can accommodate the full cycle including attracting and managing tenants and promoting sales

Source: JICA Study Team

Table 6.2-29 Improvement Proposal-PH1-2-T4

Title	Introducing the Sales Percentages System
Issue	4-5 Rents are set on the basis of floor space rather than sales volume
Factor Analysis	No POS (sales management system) or system of revenue management by CAAB staff Even in Dhaka City, fixed rent leases are increased every year
Objective	Change lease conditions to increase revenue
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Convert fixed rent system to sales-based system so improved retail revenue leads to improved revenue for the airport company • Consolidate the organizational framework and build a system that can accommodate the full cycle including attracting and managing tenants and promoting sales

Source: JICA Study Team

Table 6.2-30 Improvement Proposal-PH1-2-T5

Title	Introducing the Management System of Sales Percentages
Issue	4-6 No knowledge of sales revenue
Factor Analysis	• No need to know sales revenue because of fixed rent system
Objective	Understanding revenue trends will enable CAAB to make decision on renewing leases and encourage tenant replacement
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Introduce POS (sales management system) (if not possible, obtain daily and monthly reports from tenants) • Convert fixed rent system to sales-based system so improved retail revenue leads to improved revenue for the airport company • Consolidate the organizational framework and build a system that can accommodate the full cycle including attracting and managing tenants and promoting sales

Source: JICA Study Team

Table 6.2-31 Improvement Proposal-PH1-2-T6

Title	Ease the Congestion of the Space in Front of the Check-in Counter
Issue	4-, 4-10 Congestion due to inadequate space in front of check-in counters
Factor Analysis	<ul style="list-style-type: none"> • Chairs provided by CAAB contribute to crowding in some areas • Lack of facility management awareness in CAAB • Failure to obtain rental for counters also a factor in that lack of awareness
Objective	Maintain the terminal lobbies in an orderly condition to leave an impression with passengers
Allocated To	CAAB
Method	• Remove benches from spaces in front of counters

Source: JICA Study Team

Table 6.2-32 Improvement Proposal-PH1-2-T7

Title	Arrange the Space in Front of the Counters
Issue	4-10, 4-11 Stanchions and seating class check-in displays are left in the spaces in front of the counters even when the counters are not in use.
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness in CAAB • Failure to obtain rental for counters also a factor in that lack of awareness
Objective	Maintain the terminal lobbies in an orderly condition to leave an impression with passengers
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Collect counter rental to clarify that counters are facilities leased to the airlines by the CAAB • The CAAB can then exercise its authority to instruct the airlines and ensure total control of airline inventories

Source: JICA Study Team

Table 6.2-33 Improvement Proposal-PH1-2-T8

Title	Improve the Cleaning of Toilets
Issue	4-12 Cleaning is not done properly in toilets, corridors and offices
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness in CAAB • Inadequate CAAB instruction • Specification sheets for CAAB contractors need to be checked
Objective	Strive to improve employee satisfaction (ES) by improving hygiene in the environment
Allocated To	CAAB
Method	Review cleaning descriptions and frequency, etc. in specifications issued to contracts

Source: JICA Study Team

Table 6.2-34 Improvement Proposal-PH1-2-T9

Title	Arrange the Space in Front of the Airlines Office
Issue	4-13 Materials piled up in front of airline offices
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness in CAAB • Inadequate CAAB instruction
Objective	Ensure orderly office area
Allocated To	CAAB
Method	Ensure patrols by CAAB staff and instructions to all airlines and other tenants

Source: JICA Study Team

Table 6.2-35 Improvement Proposal-PH1-2-T10

Title	Clean and Arrange the Office Area
Issue	4-14 Discarded items and obsolete furniture piled up in corridor corners
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness in CAAB • Inadequate CAAB instruction
Objective	Improved employee satisfaction (ES) by ensuring orderly office areas and improving hygiene in the environment
Allocated To	CAAB
Method	Dispose of items immediately and, as a follow up measure, organize patrols by CAAB staff and instructions to all airlines and other tenants

Source: JICA Study Team

Table 6.2-36 Improvement Proposal-PH1-2-T11

Title	Increase the Number of Information Counter
Issue	4-15 Not enough information counters
Factor Analysis	<ul style="list-style-type: none"> • Probably no customer satisfaction concepts in the first place
Objective	Improve information to passengers by adding more information counters
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • On 2 at present but will be increased to 6

Source: JICA Study Team

Table 6.2-37 Improvement Proposal-PH1-2-T12

Title	Increase the Number of Smoking Area
Issue	4-16 Only 1 smoking area
Factor Analysis	<ul style="list-style-type: none"> • Probably no customer satisfaction concepts in the first place
Objective	Improve accessibility to smoking areas by adding more
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • More smoking areas will be added when Terminal 3 is commissioned

Source: JICA Study Team

Table 6.2-38 Improvement Proposal-PH1-2-T13

Title	Increase the Number of Comment Box
Issue	4-17 Not enough customer feedback boxes and negative title given to boxes
Factor Analysis	• Probably no customer satisfaction concepts in the first place
Objective	Collect constructive ideas other than passenger complaints
Allocated To	CAAB
Method	Change the title of the boxes (Example: Comments Box)

Source: JICA Study Team

Table 6.2-39 Improvement Proposal-PH1-2-T14

Title	Improve the Access Control
Issue	4-18 No control over entry and exit from office areas; anyone can gain access
Factor Analysis	• Need to check possibility of airside access from office areas
Objective	Improve security of office areas
Allocated To	CAAB
Method	• In view of the possibility of gaining access from the terminal lobbies via stairs, static guards are needed to control access

Source: JICA Study Team

Table 6.2-40 Improvement Proposal-PH1-2-T15

Title	Improve the Confidence of car Parking
Issue	4-19 Little use of multistory car park, interior dark
Factor Analysis	• Need to check lighting control situation • Need to check differences in parking fees with car parks in front of passenger terminals
Objective	Illuminate car park at all times and improve environment
Allocated To	CAAB
Method	• Check lighting control with contractor • Increase patrols and ensure thorough instructions

Source: JICA Study Team

Table 6.2-41 Improvement Proposal-PH1-2-T16

Title	Improve the Cleaning of Terminal
Issue-1	4-22 Garbage and baggage carts abandoned in corners of the departure lobbies and in dead areas along passenger flow lines
Issue-2	4-23 Garbage overflowing from garbage bins in departure lobbies
Issue-3	4-24 Garbage scattered in lost baggage rooms
Factor Analysis	• Lack of facility management awareness in CAAB • Inadequate CAAB instruction • Need to check details of CAAB agreements with cleaning contractors
Objective	Maintain the terminal lobbies in an orderly condition to leave an impression with passengers
Allocated To	CAAB
Method	Review cleaning descriptions and frequency, etc. in specifications issued to contracts

Source: JICA Study Team

(4) Terminal Facility Maintenance and Management

Regarding improvement proposals on terminal facility maintenance and management, items with relatively low urgency (Phase1-2) are summarized in Table 6.2-42~ Table 6.2-57.

Table 6.2-42 Improvement Proposal-PH1-2-M1

Title	Signage Improvement (1)
Issue	5-1 No layout maps in departure or arrival lobbies so passengers don't know where anything is
Factor Analysis	<ul style="list-style-type: none"> • Lack of awareness in terms of service level improvements • Facilities not laid out in line of passenger sight • No CAAB budgetary problems
Objective	Improve information signage
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Provide additional signage and improve • Create a customer satisfaction improvement framework and consider improvements to information displays • Provide guidelines for passenger information signage (defining text, multilingual signage, pictograms, and layout plans, etc.) (to be done in conjunction with the preparations for the commissioning of Terminal 3)

Source: JICA Study Team

Table 6.2-43 Improvement Proposal-PH1-2-M2

Title	Signage Improvement (2)
Issue	5-1, 5-3 Check-in counter signs in departure lobbies are difficult to understand and passengers do not know which check-in counter to go to
Factor Analysis	<ul style="list-style-type: none"> • Lack of awareness in terms of service level improvements • Facilities not laid out in line of passenger sight
Objective	Improve information signage
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • The CAAB is presently installing check-in counter information in curbside areas so this situation will need to be checked after completion.

Source: JICA Study Team

Table 6.2-44 Improvement Proposal-PH1-2-M3

Title	Improvement of Curbside
Issue	4-20 Terminal entrances are congested with people and baggage during peak hours, overflowing onto the road and posing a real danger of an accident resulting in death or injury.
Factor Analysis	<ul style="list-style-type: none"> • Facility status • Delays caused by people and baggage waiting at terminal entrances. Inadequate space. Large numbers of meeters and greeters.
Objective	Relieve congestion in the proximity of terminal entrances.
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Improve throughput at terminal entry security checkpoints (increase booth and staff numbers, etc.) • Expand the curbside areas (remove fences and create two vehicle lanes, etc.) • Consider the possibility of devoting one vehicle lane for use as a fare welling space after looking at congestion levels, including levels after the commissioning of Terminal 3

Source: JICA Study Team

Table 6.2-45 Improvement Proposal-PH1-2-M4

Title	Improvement of Transfer
Issue	5-4 Information on connecting between domestic and international flights is difficult to understand
Factor Analysis	<ul style="list-style-type: none"> • Facility equipment status • Inadequate information signage and displays
Objective	Improve information on connecting between domestic and international flights
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Provide additional signage and improve • Create a customer satisfaction improvement framework and consider improvements to information displays • Recruit and train more information staff, etc.

Source: JICA Study Team

Table 6.2-46 Improvement Proposal-PH1-2-M5

Title	Improvement of Electricity Room
Issue	5-5 Wiring in the 48 electrical plant rooms in the passenger terminals is untidy and the rooms are littered with garbage
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness
Objective	Improve facility maintenance management
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Improvements to equipment room management methods and facility maintenance manage will be introduced with the preparations for the commissioning of Terminal 3 and will also be introduced in existing terminals.

Source: JICA Study Team

Table 6.2-47 Improvement Proposal-PH1-2-M6

Title	Improvement of environment at the Office Area
Issue	5-6 Wiring is exposed in office area corridors
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness
Objective	Improve facility maintenance management
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Improve the environment in office areas. • The CAAB is improving its awareness of employee satisfaction and will upgrade staff areas.

Source: JICA Study Team

Table 6.2-48 Improvement Proposal-PH1-2-M7

Title	Improvement of Sorting Area
Issue	5-7, 5-8 Tools, etc. are not put away in the sorting areas and waste material also litter the areas
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness • Insufficient instructions from CAAB
Objective	Improve facility maintenance management
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Improvements to tool and waste management methods and facility maintenance management will be introduced with the preparations for the commissioning of Terminal 3 and will also be introduced in existing terminals.

Source: JICA Study Team

Table 6.2-49 Improvement Proposal-PH1-2-M8

Title	Improvement of Signage at their Curbside
Issue	5-10 There are no airline signs on the departure level curbside areas, so passengers don't know where to be dropped off
Factor Analysis	<ul style="list-style-type: none"> • Lack of awareness of service level improvement • Facilities not laid out in line of passenger sight • No CAAB budgetary problems
Objective	Improve information signage
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Provide additional signage and improve • Create a customer satisfaction improvement framework and consider improvements to information displays • Provide guidelines for passenger information signage (defining text, multilingual signage, pictograms, and layout plans, etc.) (to be done in conjunction with the preparations for the commissioning of Terminal 3)

Source: JICA Study Team

Table 6.2-50 Improvement Proposal-PH1-2-M9

Title	Improvement of Traffic Congestion at the Curbside
Issue	4-20, 5-11 Taxis, buses and private automobiles all use the same lanes on the departure and arrival levels and, in addition, there is no taxi pool. Therefore, curbside areas are congested and uncontrolled
Factor Analysis	<ul style="list-style-type: none"> • Lack of awareness in terms of service level improvements • Facilities not laid out in line of passenger sight
Objective	Relieve curbside congestion
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Expand the curbside areas (remove fences and create two vehicle lanes, etc.) • Consider the possibility of devoting one vehicle lane for use as a fare welling space after looking at congestion levels, including levels after the commissioning of Terminal 3.

Source: JICA Study Team

Table 6.2-51 Improvement Proposal-PH1-2-M10

Title	Universal Design at the Curbside
Issue	5-12 At the departure curbside areas, passengers must negotiate two steps from the road to the departure lobby
Factor Analysis	<ul style="list-style-type: none"> • Lack of awareness of need to place facilities in passenger line of sight • No development of awareness of Universal Design (UD)
Objective	Improve curbside facilities
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Improve curbside facilities (remove steps and make UD compatible) • Examine based on development cost and effect

Source: JICA Study Team

Table 6.2-52 Improvement Proposal-PH1-2-M11

Title	Cleaving the Cargo Area
Issue	5-13 Garbage is scattered all over the cargo area
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness • Insufficient instructions from CAAB • No development of awareness of employee satisfaction (ES)
Objective	Improve facility maintenance and management in the cargo area
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Review cleaning descriptions and frequency, etc. in specifications issued to contracts

Source: JICA Study Team

Table 6.2-53 Improvement Proposal-PH1-2-M12

Title	Cleaning the toilets at the Office Area
Issue	5-14 Toilets are used by staff only and are extremely dirty
Factor Analysis	<ul style="list-style-type: none"> • Lack of facility management awareness • Insufficient instructions from CAAB • No development of awareness of employee satisfaction (ES)
Objective	Improve staff toilets
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Review cleaning descriptions and frequency, etc. in specifications issued to contracts

Source: JICA Study Team

Table 6.2-54 Improvement Proposal-PH1-2-M13

Title	Improvement of Confidence at the Gate Lounge
Issue	4-21 No drinking water available in gate lounges
Factor Analysis	<ul style="list-style-type: none"> • Facility status (No shops or water fountains)
Objective	Provide advance information on equipment in gate lounges
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Information for passengers prior to gate security (provide signs, etc.) • This will be improved with the use of a centralized security screening format in Terminal 3

Source: JICA Study Team

Table 6.2-55 Improvement Proposal-PH1-2-M14

Title	Repairing the Roof for Stopping the Rain Leak
Issue	4-25 Roof leaks where Terminals 1 and 2 joins.
Factor Analysis	<ul style="list-style-type: none"> • Facility status • Facility replacement status (Maintenance and inspection not performed correctly.)
Objective	Improve facility maintenance management
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Undertake proper maintenance management • In addition, provide maintenance management frameworks for preventative maintenance, draft manuals and train staff, etc.

Source: JICA Study Team

Table 6.2-56 Improvement Proposal-PH1-2-M15

Title	Exterminating Animals from the Terminal Building
Issue	4-26 Too many animals and insects in the terminals (dogs, cats, mice and mosquitoes).
Factor Analysis	<ul style="list-style-type: none"> • Facility status • Facility replacement status (No hygiene management improvement strategies.)
Objective	Improve safety and hygiene management in the terminals
Allocated To	CAAB
Method	<ul style="list-style-type: none"> • Capture and remove animals, pests and insects in the terminals, clean and carry out eradication controls regularly to exercise proper maintenance management • Review maintenance management systems and manuals as necessary and train staff, etc.

Source: JICA Study Team

Table 6.2-57 Improvement Proposal-PH1-2-M16

Title	Improvement of Storage Managing
Issue	5-9 Spare fluorescent lights have been placed in the Combined Complain Center, with no indication of inventory management
Factor Analysis	•Lack of facility management awareness
Objective	Improve the facility management
Allocated To	CAAB
Method	• Conduct ah

Source: JICA Study Team

(5) Departure/Arrival Immigration and Customs

Regarding the improvement proposal on departure/arrival and customs service, items with relatively low urgency (Phase 1-2) are summarized in Table 6.2-58~Table 6.2-63.

Table 6.2-58 Improvement Proposal-PH1-1-Cu1

Title	Improvement of Personnel shortage in Immigration
Issues	6-1 Personnel shortage in immigration
Cause Analysis	• Personnel structure • Business contents of each department • Wages, Conditions
Objective	Implementation of stable handling
Allocated To	Immigration
Method	• Determine and calculate the necessary number of staff • Review and review the scope of work of each department • Continued recruitment • Improve staff motivation and morality • Reconsider employment form and wages

Source: JICA Study Team

Table 6.2-59 Improvement Proposal-PH1-1-Cu2

Title	Expertise in Immigration Control Work
Issues	6-2 Position changing policy at immigration control office for fraud prevention hinders immigration inspection officer from acquiring skills required for immigration control work.
Cause Analysis	• Personnel structure • Business contents of each department • Wages, Conditions • Lack of initiative • Moral
Objective	Implementation of smooth immigration examination by extending the assignment period of immigration officers
Allocated To	Immigration
Method	• Review and review the scope of work of each department • Improve staff motivation and morality • Reconsider wages and conditions

Source: JICA Study Team

Table 6.2-60 Improvement Proposal-PH1-1-Cu3

Title	Improvement of Personnel Shortage in Customs
Issues	6-3 Personnel shortage in Customs
Cause Analysis	<ul style="list-style-type: none"> • Personnel structure • Business contents of each department • Wages, Conditions
Objective	Implementation of smooth customs inspection with stable personnel structure
Allocated To	Customs
Method	<ul style="list-style-type: none"> • Determine and calculate the necessary number of staff • Review and review the scope of work of each department • Continued recruitment • Improve staff motivation and morality • Reconsider employment form and wages

Source: JICA Study Team

Table 6.2-61 Improvement Proposal-PH1-1-Cu4

Title	Reduction of Incomplete Entry of Departure Documents
Issues	6-4 There are many Bangladeshi passengers who have incomplete entry of departure documents in immigration control and it takes unnecessary time for the review.
Cause Analysis	<ul style="list-style-type: none"> • Lack of education and training • Work process unfinished / Work process not updated • Inadequate understanding of instruction content • They have not confirmed departure documents at the entrance to the screening site.
Objective	By reducing the incompleteness of entry of departure documents, the time to exit for departure is shortened, congestion is alleviated, convenience and comfort are improved.
Allocated To	Immigration
Method	<ul style="list-style-type: none"> • Confirmation of departure documents will be carried out. • An example of entry is posted.

Source: JICA Study Team

Table 6.2-62 Improvement Proposal-PH1-1-Cu5

Title	Congestion Relief at Departure Immigration Area
Issues	6-5 The departure immigration area is narrow and crowded.
Cause Analysis	<ul style="list-style-type: none"> • Facility current condition • At the peak time, there is a state that cannot enter the departure immigration area. • Personnel structure
Objective	Convenience and comfort are improved by alleviating congestion at the departure immigration area.
Allocated To	Immigration
Method	<ul style="list-style-type: none"> • Determine and calculate the required number of officer • Increase use frequency of Immigration 2. • Provide support within the immigration area and guide the line smoothly. • Further train the officer and shorten the process time.

Source: JICA Study Team

Table 6.2-63 Improvement Proposal-PH1-1-Cu6

Title	Update Computer
Issues	6-6 the Personal Computer used in immigration control office runs "Windows XP".
Cause Analysis	<ul style="list-style-type: none"> • As support for Windows XP is terminated, security is vulnerable.
Objective	By introducing a new PC (OS), aim to shorten the process time and keep high security level.
Allocated To	Immigration
Method	<ul style="list-style-type: none"> • Securing budget

Source: JICA Study Team

6.2.3 Concept of Capacity Building Project

(1) About Capacity Building Project

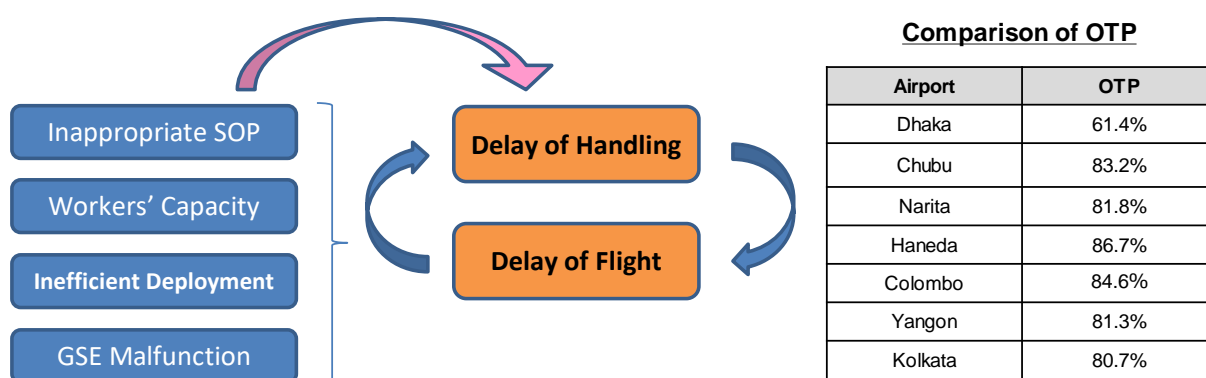
The supporting concept of capacity building project focuses on the major issues of ramp service (operation of GSE, maintenance of GSE) and cargo handling, are explained in the next section. Regarding the priority improvement proposals (Phase 1-2) introduced in section 6.2.1, ramp service and cargo handling were chosen since their priority are high and technical support are required.

1) Ramp Service (GSE Operation)

Regarding the On-time Performance (OTP) record, HSIA is about 60%, which is considerably lower than that of the same size airports and Japanese airports, whose record is about 80%.

The main cause of low OTP is inadequate SOP/manual, GSE shortage, inefficient allocation of GSE and frequent GSE failures.

Delays in ground handling in ramp service cause delays in other flights and thus fall into a vicious cycle that delay causes further delay.



Source: JICA Study Team

Figure 6.2-1 Issues and its Cause Regarding Ramp Service

2) Ramp Service (GSE Maintenance)

The GSE failure rate at HSIA is about 35% of the total, which is high compared to other airports. The main cause of the high GSE failure rate is as below.

- As the purchase procedure at Biman Airlines of the necessary parts for repair takes six months to twelve months, the repair period has been prolonged.
- Staff's knowledge and skills are short due to lack of training.
- Personnel shortage at Management level is more prominent than worker level at Airport Service Division. 35 management levels are required, but currently there are only 5 management. It is not an organizational structure that can provide appropriate maintenance planning, necessary instruction and judgment, and education for worker.

Regarding improvement proposals about OPT and GSE maintenance are explained in section 6.2.3 "Concept of Capacity Building Project."

3) Cargo Handling

The priority improvement proposals (Phase 1-1) regarding cargo handling focuses on the processing speed and quality control of cargo handling.

a) The Processing Speed of Cargo Handling

The handling speed of import/export cargo in HSIA is relatively slow compared to that in Japan. This slow processing speed is considered as a bottleneck of cargo handling operation in HSIA.

b) Quality Control of Cargo Handling

There were 74 accidents in the past 5 years in Cargo Terminal (source: Biman Airlines) and frequent loss of cargoes during the handling process are reported. (source: Japanese forwarder) Therefore, it is estimated that the essential rule is not familiar to the ground handling staff and the adequate training is not being conducted.

(2) Workflow of Capacity Building Project

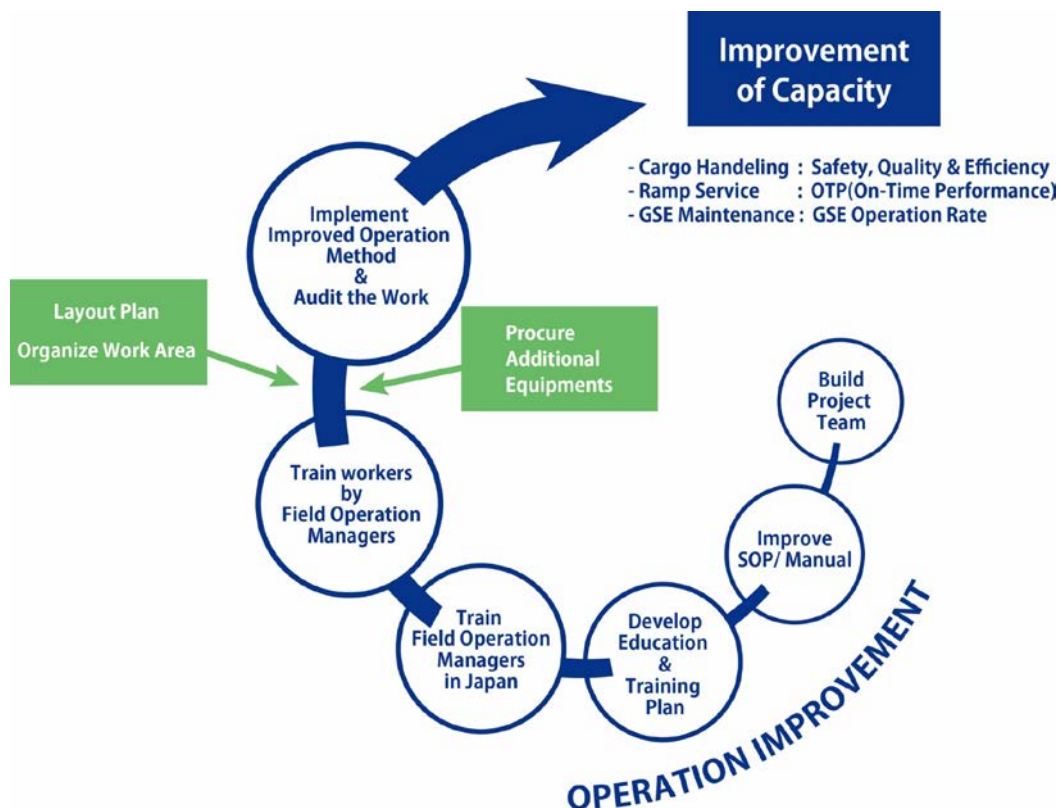
In response to the above issues, we propose an improvement plan in six steps. First of all, i) the improvement project team's composition and ii) revision of current SOP and manual up to the working level. After that, ii) education curriculum planning such as basic education and qualification management, and improve education and guidance system.

Partly in parallel, iii) training and lectures in Japan for site work managers and ensuring the direction for improved management by having the trainee to experience cutting-edge operations. After that, iv) implementation of what is learned by on-site work managers based on experience in Japan and SOP, manual and education curriculum created.

In parallel with this, v) planning the necessary equipment (implement equipment procurement as necessary), revision of the layout plan, implementation of the organized plan and implement it.

Based on the above, vi) carrying out with the improved operation policy in line with work. In addition, we aim to independently monitor the work for the purpose of continuous improvement, aim for a system that can be monitored and improved.

Figure 6.2-2 shows the workflow image for improving operations.



Source: JICA Study Team

Figure 6.2-2 Workflow of Operation Improvement

(3) Project Design Matrix (PDM) (Phase 1)

The simplified project design matrices are shown in Table 6.2-64 and Table 6.2-65. The specific activities regarding ramp service, GSE and cargo handling will be conducted in phase 1, will be introduced in the next section.

Table 6.2-64 Simplified Project Design Matrix (1/2)

Narrative of Summary	Objectively Verifiable Indicators
Overall Goal	Indicators of project goals
Ground Handling Capacity of Biman Bangladesh is improved	1 On Time Performance (OTP) will be improved 2 GSE serviceable ratio will be improved 3-1 Number of accident in cargo warehouse should be decreased (Safety). 3-2 Number of lost/damaged cargo should be decreased (Quality). 3-3 Processing Time for Import/Export will be shortened (Efficiency).
Output (main items to achieve the project goal)	Output indicators (results obtained as a result of each activity)
1. Ramp Service Capacity of Biman Airlines is improved	1-1 Project team has been built. 1-2 Modified SOP/work schedule for each equipment/manpower and equipment location plan/safety management plan/GSE inspection routine plan are executed. 1-3 Curriculum of basic education and guidance system have been formulated. Filed operation managers have been developed able to instruct employees. 1-4 Ramp service quality knowledge learned in Japan through management classes are shared with other management classes. 1-5 Over 80% of all employees will have taken the basic education. 1-6 Ramps and container yards are organized and arranged. 1-7 Necessary equipment is reviewed and replenished. 1-8-1 Over 70% of flight handling is completed before the time indicated in the ramp work table, excluding flights with inevitable reason. 1-8-2 Daily routine inspection methods for GSE are formulated. More than 80% of the inspections are implemented based on these methods.
2. GSE Maintenance Capacity of Biman Airlines is improved	2-1 Project team constitution is improved. 2-2 Maintenance plan, inspection item, maintenance record management analysis method and maintenance method for GSE are formulated. 2-3-1 Curriculum of basic education and guidance system have been formulated. Filed operation managers have been developed able to instruct employees. 2-3-2 Qualification management plan is executed, and the number of qualified holders is increasing. 2-4 GSE maintenance technology mastered through OJT in Japan through management classes are shared with other management classes. 2-5 Daily inspection methods for GSE are formulated. More than 80% of the inspections are implemented based on these methods. 2-6 GSE hanger are organized and arranged. 2-7 Necessary equipment is reviewed and replenished. 2-8 The GSE has been regularly maintenance according to the plan. Maintenance time is reduced by 20% and the quality is maintained.
3. Cargo Handling Capacity of Biman Airlines is improved	3-1 Project team for improvement plan has been set up. 3-2 Modified version of SOP has been prepared and the consciousness of safety/quality/efficiency has been pervading to cargo staff. 3-3 Curriculum of basic training system has been formulated and frontline instructors have been to cargo staff. 3-4 Instructors who were trained in overseas share experience and knowledge with other cargo staff. 3-5 Handling layouts of export and import warehouse has been reviewed for moving cargo smoothly in the warehouse. 3-6 Facility and required number of equipment has been reviewed and replenished for efficient cargo handling. 3-7 Cargo has been handled according to manuals and external audit has been held regularly.

Source: JICA Study Team

Table 6.2-65 Simplified Project Design Matrix (2/2)

Activities (Activities by Biman Airlines to accomplish Outputs with cooperation of JICA Specialists)	Inputs
1 Improve Ramp Service Ability	Bangladesh side Inputs
1-1 Build a project team.	Counterpart
1-2 Improve SOP, work schedule, safety management and daily inspection plan.	• Project Director (CAAB/Biman Airlines Assumed)
1-3 Develop education curriculum and license management.	• Project Manager (CAAB/Biman Airlines Assumed)
1-4 Train filed operation managers in Japan.	• Cargo Handling Team (Biman Airlines Assumed)
1-5 Train workers by filed operation manager.	• Ramp Handling Team (Biman Airlines Assumed)
1-6 Organize ramp area and container yard.	• GSE Maintenance Management Team (Biman Airlines Assumed)
1-7 Procure additional ramp handling equipment.	
1-8 Improved implementation of ramp handing operations and audit work.	Equipment (to be discussed)
	• Passenger Step Car (Wide Body) • Delivery Car (Pick Up Track) • Flush Car (Lavatory Service Car) • Water Car • Baggage Cart • Belt Loader Car • Main Deck Loader (MDL) • Tow Tractor (TT) • Pallet Dolly
2 Improve GSE Maintenance Management Ability	
2-1 Build a project team.	Others
2-2 Improve maintenance plan, inspection item and analysis method of maintenance record.	• Project Office
2-3 Develop education curriculum and license management.	• Project Operating Cost
2-4 Train filed operation managers in Japan.	
2-5 Train workers by filed operation manager.	Japan side Inputs
2-6 Organize GSE hangar area.	Specialist
2-7 Procure additional GSE maintenance equipment and repair parts.	• Chief Advisor
2-8 Improved implementation of GSE maintenance operations and audit work.	• Import Air Cargo Specialist • Export Air Cargo Specialist
3 Improve Import and Export Air Cargo Handling Capacity	• Ramp Service Specialist (Safety & Quality)
3-1 Set up project teams.	• Ramp Service Specialist (Handling)
3-2 Modify simplified SOP (Standard Operating Procedure) for cargo handling.	• GSE Maintenance Management Specialist
3-3 Set up curriculum of basic training.	• Organization / Institution / Education
3-4 Train filed supervisors in Japan or other countries.	
3-5 Train cargo staff by filed supervisors.	Training in Japan
3-6 Handling layouts of export and import warehouse are reviewed.	• Air Cargo Handling Training
3-7 Cargo is handled according to manuals and external audit holds regularly.	• Ramp Service Training • GSE Maintenance Management Training

Source: JICA Study Team

(4) Ramp Service (GSE Operation)

1) Activity 1-1: Composition of the Improvement Project Team

As a member, clarify the member's responsibility by making the following as the core members and to be the person in-charge of each field subject to the T/C project. Progress management of the JICA T/C project as a whole and adjustment of the whole will be implemented.

*As the ramp service is performed by the GSE Department and the Airport Service Department of Biman Airlines, the project team members are to be appointed from both divisions.

- GM (Airport Services)
- DGM (Airport Services), DGM (Ground Handling), DGM (GSE Operation)
- Manager (Training & Quality), Manager (Baggage Services), Manager (Helper Management), Manager (Above Wing), Manager (Below Wing), Manager (GSE Operation)
- Instructor

2) Activity1-2: SOP for ramp service / work schedule table for each equipment / personnel / equipment allocation plan / safety management plan / GSE modify daily inspection plan

As for the documents to be prepared, SOP, work process chart, human resource, equipment distribution plan, safety management plan, and GSE daily inspection plan.

a) SOP

Biman Airlines produces SOPs on safety, quality, and work efficiency that workers should observe and are used as a teaching materials for basic education. Also, as to the changes of SOP, Biman Airlines is trying to thoroughly inform all workers.

b) Work schedule table

The work and time required for arrival and departure of the aircraft are clearly stated in the operation schedule table for each equipment until arrival and departure of the aircraft.

c) Staff and equipment allocation plan

Depending on the work schedule specified for each machine, the necessary personnel and equipment arrangement is planned per flight unit / daily unit / weekly unit / monthly unit / semi-annual unit (summer and winter time table) / year and determines the plan value necessary for the business management of the ramp service.

d) Safety management plan

Regarding safety, Biman Airlines built a Safety Management System (SMS) and PDCA cycle.

e) GSE Daily Inspection Report

"Inspection item", "Inspection method", "Implementor", "Timing of implementation", "Management method", and "Information sharing with the GSE department" are formulated.

3) Activity1-3: Develop curriculum and guidance system for basic education and qualification management

Regarding "Loading and Unloading", "Transportation", "build-up / returning of baggage", "operation and dismounting operation of the aircraft to and from the aircraft", "door operation", "basic operation", "GSE driving operation (apron and beside an aircraft)" and so on, to organize the curriculum to improve safety, quality, and work efficiency.

Moreover, training and institution of the instructor who carries out basic education will be developed. The instructor candidate is assumed to be a field work manager.

Furthermore, Biman Airlines will develop a curriculum for qualification and qualification maintenance training on "GSE driving operation qualification (for each GSE equipment)", "door operation (for each aircraft)" and will take charge of departments and methods responsible for education and training, qualification management, and maintain divisions and methods.

4) Activity 1-4: Staff of manager level attends lecture on ramp service in Japan

In the airport of Japan, staff of manager level receives the lecture of Japanese quality ramp service as the target and opportunity to observe and learn how the site is set up. Guidance and education to workers are carried out based on the results learned in Japan.

5) Activity 1-5: Manager staff gives basic education to workers

Manager staff who are trained as instructors will conduct basic education according to the curriculum of basic education.

6) Activity 1-6: Organize and arrange ramp area and container yard

The following items are checked items and periodically be checked:

a) Ramp area

- In order to prevent Foreign Object Damage (FOD) by a foreign object to the aircraft, FOD check is always carried out as preparation for ramp service work every time.
- Pick-up garbage and clean up the ramp area and organize and arrange it.
- Store the GSE and container and pallet in the designated place.
- Do not leave empty containers on the ramp directly on the ground.
- Do not leave inoperable GSE in the ramp area.

b) Container yard

- Remove the broken container, pallet, loading member (net, belt, etc.) and screen for disposal and/or repair.
- Implement classification of containers, pallets, and storage areas of loading equipment.
- Do not store the container and pallet directly on the ground and store it in a rack.
- Periodically carry out stocktaking and try to organize.

7) Activity 1-7: Ramp equipment plan modified and replenishment is done

Determining equipment plan necessary for the operation of the ramp service according to the plan of the airline and the aircraft planned for use. Furthermore, it compares with the current equipment plan and replenishes the shortfall.

8) Activity 1-8: Work process and audit according to each SOP / equipment / human resources / equipment placement plans / safety management plan / GSE daily inspection plans

Periodically conduct audits and verify that business operations and work flow are implemented with the plan. Establish divisions and methods in-charge of the Auditing Department.

(5) GSE (GSE Maintenance)

1) Activity 2-1: Composition of Improvement Project Team

As a member, clarify the responsibility system by making the following as the core members and to be the person in-charge of each field subject to the T/C project. Progress management of the entire JICA T/C project and implementation of overall adjustment.

- GM (GSE)

- DGM (Maintenance)
- Manager (Quality Control), Manager (Planning), Manager (Maintenance)
- Instructor

- 2) Activity 2-2: Maintenance and management plan concerning maintenance of GSE / inspection item / management maintenance record analysis method.

As for creating documents, maintenance plan, inspection item, and management maintenance record analysis method will be organized.

- a) Maintenance plan

Set the period of periodic inspection and inspection content for each GSE vehicle type, add maintenance plans for each type, and prepare maintenance plans for the entire GSE department. Then, allocate maintenance plan for each GSE vehicle and conduct specific management. In addition, according to the maintenance plan of the entire GSE department, necessary personnel and maintenance equipment are planned to be arranged on a daily basis, monthly basis, and year basis and plan values necessary for business operation of GSE maintenance.

- b) Inspection item

To set inspection items according to the period of periodic inspection and inspection content for each vehicle type.

- c) Management maintenance record analysis method

Maintenance record in the periodic inspection and maintenance record at failure shall be kept and data be collected. Analyze the accumulated data and set the "timing of parts replacement", "replenishment time of expendables (oil, etc.)" at an appropriate time. In addition to sharing daily inspection data from the ramp service division in order to create a system to prevent failures.

- 3) Activity 2-3: Organize curriculum and education structure for basic education and qualification management

Biman Airlines will develop a curriculum for basic education to improve work quality, work efficiency concerning vehicle maintenance technology, electrical engineering, electronics engineering, battery, engine, welding, painting, tire, air conditioner, and vehicle equipment. In addition, Biman Airlines will develop a curriculum for basic education to improve work quality and work efficiency concerning repair of ULD, dolly, baggage cart, etc.

Furthermore, training and institution of instructor, who carries out basic education, will be developed. Candidate instructor is a field work manager.

The curriculum of qualification and qualification maintenance training will be developed concerning vehicle maintenance technology, electrical engineering, electronics, batteries, engines, welding, painting, tires, air conditioning, and vehicle equipment.

Establish a curriculum for qualification and qualification maintenance training on repair of ULD, tori, and baggage cart. Develop departments and methods responsible for education and training and qualification management.

- 4) Activity 2-4: Staff of manager level acquire maintenance skills of GSE equipment through on-the-job (OJT) in Japan

In the airport of Japan, staff of manager level receives the lecture of the Japanese quality GSE equipment maintenance technology to be targeted from now and has the opportunity to observe and learn the site. This gives them the opportunity to learn Japanese quality GSE equipment maintenance technology directly. Education to workers is carried out based on the results learned in Japan.

5) Activity 2-5: Manager staff gives basic education to workers

Manager staff trained as instructors to conduct basic education according to the curriculum of basic education.

6) Activity 2-6: Organize and tidy up GSE hanger

Clean-up including pick-up garbage, organize, and tidy up. The GSE and ULD to be repaired shall be kept in the designated place. Furthermore, the division of each SHOP such as vehicle maintenance, electricity, electronics, battery, engine, welding, painting, tire, air conditioner, and vehicle equipment, is organized.

Organize the classification of storage location of stored parts. Also, keep regular inventory of stored parts and try to organize regularly. Furthermore, Biman Airlines will improve lighting and prepare working environment.

7) Activity 2-7: GSE maintenance equipment planning and repair parts deployment plan modified and replenishment is done

By the management analysis of maintenance records, Biman Airlines modifies the period of periodic inspection and the contents of inspection for each type of GSE vehicle. Also, compare the existing equipment plan and replenish the shortfall.

In addition, modify the parts, consumable deployment plans according to parts replacement timing, and replenishment time of expendables (oil, etc.).

8) Activity 2-8: Work process and audit according to GSE maintenance plan / inspection item / maintenance record management analysis method

Periodically conduct audits and verify that business operations and work flow are implemented according to the plan. Establish divisions and methods in-charge of the Auditing Department.

(6) Cargo Handling

1) Action Plan 3-1: Project team for improvement plan is set up

→ Steering Committee Member of Monthly Meeting

CAAB

Biman Airlines side: CEO, directors, CEO of Sales & Marketing, GM of BATC, GM of Cargo Terminal

Japan side: T/C member

→ Purpose of the meeting:

- 1) Total progress management of JICA T/C
- 2) Overall arrangement between sections
- 3) Conduct the best form of organization
- 4) Conduct important items raised by Task Force Team (TFT)

→ Task Force Team (TFT): Member of weekly meeting

Biman Airlines side: Manager and frontline instructors of export and import and GSE, in charge of BATC, AOC and BAFFA

Japan side: T/C member

Purpose of the meeting:

- 1) Report of accident, irregularity, and delay in handling of cargo
- 2) Conduct/execute of improving safety, quality control, and necessary training on-site
- 3) Foster awareness of governance, compliance, and quality improvement reported by internal and external audit

- 2) Action Plan 3-2: Modified SOP is prepared, and the consciousness of safety / quality / efficiency is pervaded to cargo staff

By reference to the SOP of Japanese airlines, safety/quality-focused visual SOP simply modified for Biman Airlines is carried by all the cargo staff.

After pervading visual SOP, phase-2 SOP is prepared and reporting lines of manager, shift in-charge, team leader and staff are to be set-up.

- 3) Action Plan 3-3: Curriculum of basic training is set up and instructors on site instruct cargo staff
As for export handling, basic course of building up ULD, must-do's for safety, forklift handling skill and efficiency of handling is set-up.

As for import handling, curriculums with regard to placing things in the right position in the warehouse and passage, method for storage and taking inventory, course of forklift handling skill, and regulations are set-up.

Diploma course for IATA dangerous goods handling is set up and necessary number of minted staff supervise handling on site.

- 4) Action Plan 3-4: On-site instructors who were trained in overseas share experience and knowledge with other cargo staff

Instructors who were trained in leading edge overseas instruct and educate cargo staff on site based on the knowledge and skill acquired in overseas. Instructors lead to reform staff consciousness.

- 5) Action Plan 3-5: Handling layouts of Export and Import Warehouse are reviewed to make cargo moving smooth in the warehouse

- a) In the Import Warehouse:

Regulation shall be set up as follows:

- Cargo shall not be stored direct on the ground, it shall be stored on skid
- Cargo shall be piled up straight;
- Decide the storage location of pallets and skids for not to be scattered around
- Store cargo at the same location for the same AWB
- Secure traffic line for light weight forklifts to move

Through inventory at slack season, storage situation is adhered to be much organized.

- b) In the Export Warehouse:

- The space for RA3 area and common area shall be balanced for their number of airlines and volume to handle and if necessary, it shall prompt airlines to remove from the common area to RA3 area.
- Pull cargo and things together in front of X-Ray and EDS scanning machines, around truck dock to deliver cargo smoothly.
- Improve efficiency in cargo handling to keep traffic line for hand-trolleys.
- Spacious racks which is used for holding skids shall be removed to Import Warehouse to secure space for building up ULDs.
- Check the date of entry for unreserved cargo stored in front of warehouse and conduct layout of storage to make efficient handling.

- 6) Action Plan 3-6: Facility and required number of equipment are reviewed and replenish for efficient cargo handling
- Review the number of heavy weight forklift over 8 tons.
 - From the viewpoint of familiarizing operation of light weight forklifts in Phase 2, the necessary number of light weight forklifts shall be conducted for replenishment.
 - Check actual available number of dollies and towing tractors for cargo use, and replenish if necessary.
 - Installation of local air conditioner for productive efficiency and prevent irregular handling shall be conducted.

- 7) Action Plan 3-7: Cargo is handled according to manuals and conducts external audit regularly

In addition to internal audit of Biman, annual external audit shall be done by a Japanese auditor to monitor the outcome whether or not original expectations are gained.

To audit accounting as a result of internal audit, safety and quality management with independency and objectivity, execution of work according to manuals, compliance, governance, and adaptedness of environmental standard.

6.3 Operational Readiness and Airport Transfer (ORAT) for Terminal 3 and New Cargo Building (Phase 2)

6.3.1 ORAT Necessity

(1) ORAT Necessity in Facility Expansion

ORAT refers to the series of preparatory activities related to startup, operation and relocation accompanying the construction of new airport facilities.

With the opening of Terminal 3 and the new cargo building, meticulous preparation, such as ensuring the operability of plant and systems and the relocation of staff as well as all other aspects of airport operations, is crucial to a smooth transfer from the existing facilities to the new ones, bearing in mind that the new facilities are three times the size of the existing ones and the new cargo building will be two to three times larger than the existing building.

(2) Need to Raise the Standard of Operational Technology

In terms of the operation of HSIA, two stages of improvement are needed. In Stage 1, the operation of existing facilities should be upgraded, and the handling capacity of the human element in the present demand climate and airport facilities should be raised to specific levels. In Stage 2 after those improvements have taken shape, they should be smoothly transferred to Terminal 3 and the new cargo building.

The process of improving the operations in stages is key to plans for relocation to Terminal 3 and the new cargo building, and ORAT comes into play in Stage 2.

6.3.2 ORAT Description

(1) Prerequisites for Implementation of ORAT

To ensure a smooth, problem-free commissioning of Terminal 3 and the new cargo building, the preparation of organization and manuals, staff training, and coordination with the airlines, CIQ and other stakeholders should be undertaken as a preliminary step to an extent that is required and is sufficient. This series of startup and commissioning activities and generally be only possible when prerequisites a) to e) below have been satisfied.

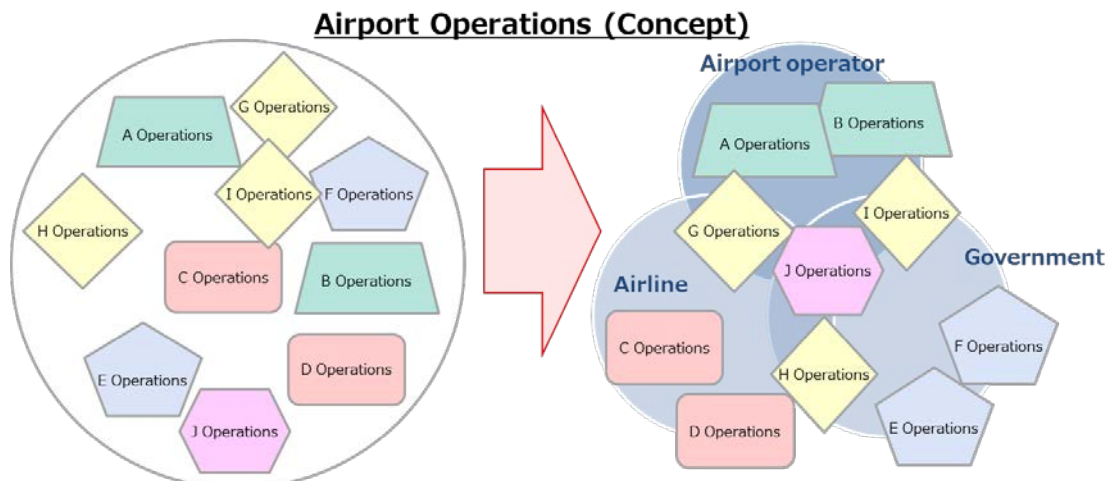
- a) Forecast project completion
- b) Forecast completion of essential associated facilities
- c) Decide the uses of the new facilities and the existing facilities
- d) Clearly define the scope operational responsibilities of the airport operator, airlines and government (CIQ, ATC, etc.)
- e) Establish a budget for the startup

Clearly defining the scope operational responsibilities of the airport operator, airlines and government (CIQ, ATC, etc.) is the most important of all of these.

But to define the scope of responsibilities, we should first decide what the responsibilities of the individual stakeholders are and avoid any leak in the work required for the startup of the new facility.

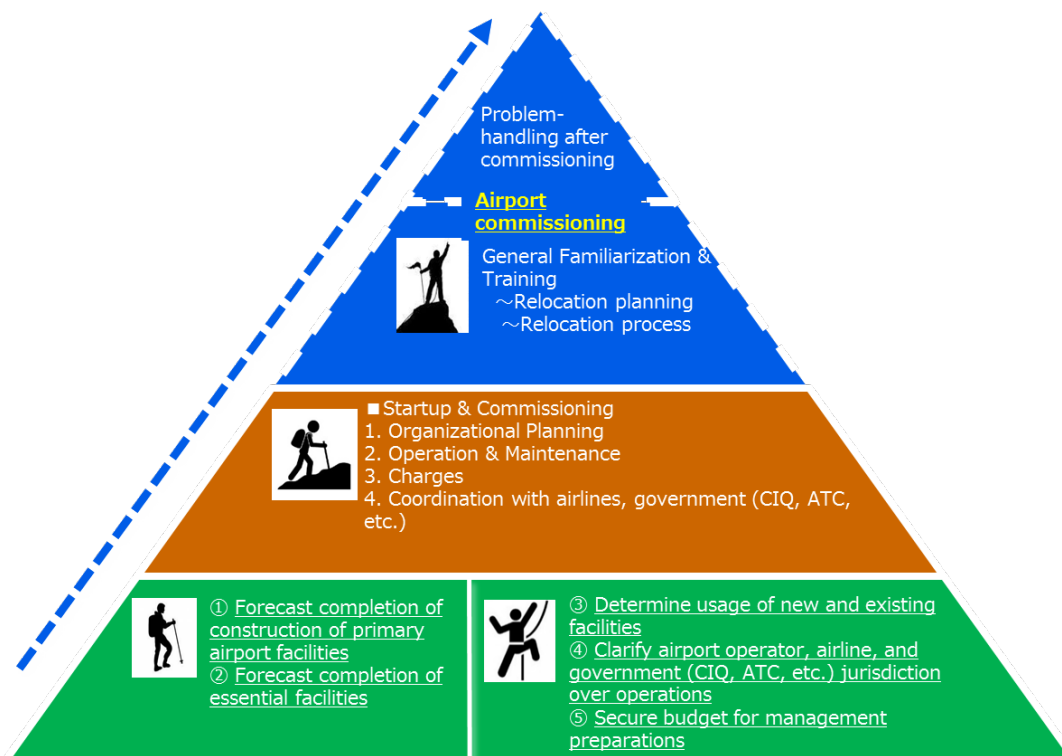
When that is done, the airlines and government (CIQ, ATC, etc.) need to remain in step with the airport operator, moving forward steadily with the preparations that are within their scope of responsibilities and for which they bear the costs. (Figure 6.3-2)

The fields where support can be provided is in the organization of the aforementioned prerequisites, recruitment of staff for creating organizations and frameworks, liaising with local consultants, etc. and introducing the essential management systems. Personnel to actually operate Terminal 3 and the new cargo building and the creation of an organization at the first opportunity are particularly important.



Source: JICA Study Team

Figure 6.3-1 Prerequisite (Clarifying the Responsibility of the Operations)



Source: JICA Study Team

Figure 6.3-2 Startup and Commission Activity

(2) ORAT Description

ORAT can be broadly divided into 1) Organizational planning, 2) Operations and maintenance (preparation of manuals, etc.), 3) Setting and notification of charges, 4) Coordination with airlines and government (CIQ, ATC, etc.), 5) General familiarization and training, 6) Planning and implementation of relocation, and 7) Problem handlings after commissioning.

In commissioning an airport, it is particularly important to ensure that there is nothing to impede the operation of the airport and that the transfer to the new facility is smooth and ensures customer trust and convenience. For that reason, conscientious preparation ahead of the event is crucial.

The expansion project involving Terminal 3 and the new cargo building at HSIA occupies an extensive area with new systems being adopted. Consequently, more staff will be needed and training will be required on the technology related to the operation of the new systems. In addition to the airport itself, consideration should also be given to access, electricity and other utilities and the relocation of services.

(3) Case Studies of Passenger Terminals at Other Airports

1) Narita International Airport

In commissioning terminal 3 at Narita International Airport, the details were decided by first listening to the needs of the airlines, CIQ and other stakeholders two years ahead. Therefore, the transition to a smooth operation was successful. Consequently, there were no major obstacles during the startup and commissioning. Users made the transition smoothly to terminal 3 and this has contributed to growth in passenger traffic at Narita Airport.

Also, before the introduction of new equipment or undertake relocation at Narita International Airport, the first check with stakeholders (CIQ, airlines, ground handling companies, etc.) to ascertain service levels under real operational conditions was conducted. When replacing baggage handling equipment in the existing terminals, etc., airport employees simulate the role of passengers and work with the ground handling companies testing systems with large numbers of dummy luggage to train and familiarize operations staff. The error incidence response drills with simulated errors or malfunctions that may occur under real operational conditions, designate a backup system and ensure beforehand that transport personnel for checked baggage are present.

Also, when they installed the new security equipments and scanners, etc. or relocating to different terminals and there are changes in usage and handling methods, stakeholders (CIQ, airlines, ground handling companies, etc.) are advised in advance and training is conducted based on manuals.

In relation to usage charges as well, the charges and their collection methods are discussed with relevant parties before work begins and they are taken into consideration in the chain of relocation planning activities so that our investment in the planning and construction of the particular project can be fully recovered.

2) Noi Bai International Airport

There was also a technical assistance for the startup and commissioning of a new passenger terminal at Noi Bai International Airport in Vietnam. The experts were sent to Vietnam to assist with the preparation of manuals and provide technical support. Their staff were invited to Narita International Airport for training using case studies of operations at Narita.

3) Mumbai Airport

Another example is the relocation into Terminal 2 (approximately 440,000m²) at Mumbai Airport in India, working in conjunction with airlines and other stakeholders, training 2,000 key member in systems and procedures, explaining and rehearsing (96 times) facility and equipment procedures to 14,500 employees and introducing 57 new systems all between 2011 and the commencement of operations in February 2014.

(4) Consideration for Relocation of Cargo Facility

The handling procedure is 180 degrees different from current human labored work to automated new cargo terminal. It becomes essential to cultivate frontline instructors to perform safe and speedy handling conform to new facility.

In addition, since cargo cannot move by itself and speak like a passenger, accurate record keeping of cargo and its location shall be required. In preparation for malfunction or blackout of the system, setting up of emergency response team is essential to avoid chaos in case of erasing the data.

Scrupulous preparation and training for cargo ORAT is essential for everything works all right.

- 1) Preparation for Automated Warehouse
 - Plot relocation plan for prior notification and transfer of GSEs etc.
 - Level up cargo handling skill aware of safety, quality and efficiency in Phase 1
 - Conduct a study of WMS (Warehouse Management System) necessary for automated warehouse and have sufficient familiarization training by the manufacturer
- 2) Preparation of New SOP for New Cargo Terminal
 - Disseminate handling procedure including irregularity case to all cargo staff by New Manual and SOP according to cargo flow in New Cargo Terminal
 - Prepare Contingency Plan for the case New Cargo Terminal gets a confusing
- 3) Set up Clear Reporting Line in New Cargo Terminal
 - Give full recognition to the significance of reporting line with the allocation of frontline working group and a backup system
 - Preparation and execution of regular training curriculum for automated warehouse

6.3.3 ORAT Support Proposal

(1) ORAT Implementation Approach at HSIA

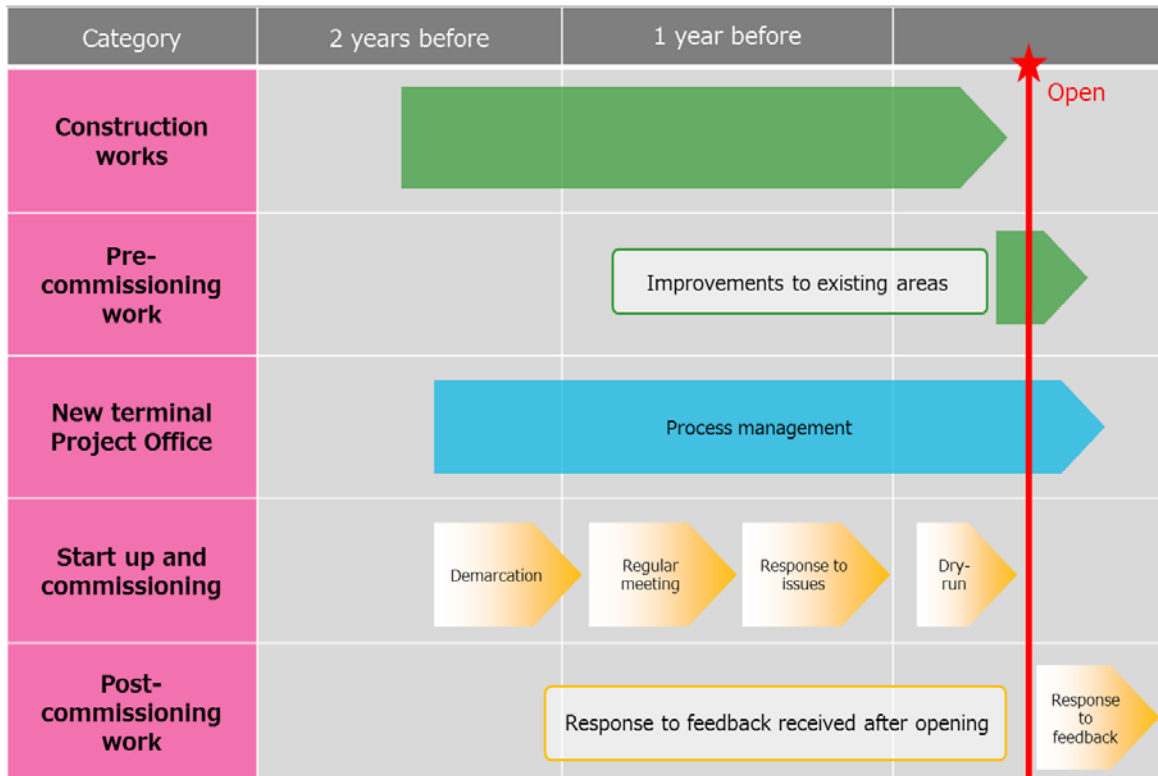
Assistance with the startup and commissioning of Terminal 3 and the new cargo building should adopt a phased approach for the relocation of existing equipment, the drafting of action plans for the commissioning of new facilities and the training of personnel. This is shown in Figure 6. 3-2 which shows the following: 1) Tenant management, 2) Customer satisfaction improvement, 3) Terminal facility maintenance and management, 4) Terminal relocation, 5) Aviation security and 5) Cargo.

When introducing new equipment in Terminal 3 in particular, operating systems will need to be reviewed and new manuals prepared. Since familiarization and training as well as relocation work will be needed before commissioning, the CAAB's level of understanding and its capacity for undertaking the startup and commissioning work should be confirmed.

The significant changes in the new cargo building systems will require extensive handling instructions for equipment from the manufacturers, the assignment of chief engineers for that equipment (to receive special training), classroom lectures on the operation of the new cargo building and work simulation training (at various levels), the placement of the necessary quantity of materials in the new building and preparation of inspection and maintenance frameworks, the drafting and distribution of new manuals and new SOPs based on the new work activity flows, fixed numbers of expected staff requirements for each section, including the service sector, the preparation of contingency plans in the event of a major failure or a delay in work procedures, and the appointment of a supervisor for the move and preparation of work plans.

(2) Envisaged ORAT Schedule for HSIA

The ORAT schedule should closely examine the schedule for the expansion project at HSIA and the facility and equipment details. Based on past precedents, ORAT activity, as shown in the draft schedule depicted in Figure 6. 3-3, will need to commence at least two years before commissioning.



Source: JICA Study Team

Figure 6.3-3 Road Map to Commissioning

6.4 Airport Operation Referring Future Demand

6.4.1 Operation System of Airport

The classification of owner and operator regarding airport operation in Japan is shown in Table 6.4-1. It shows that there are private sectors are involved in some parts. The privatization of airport operation is the world trend method to acquire safety, passenger comfortness, operation efficiency and increasing demand. Regarding the survey result that revealed the current situation of operation in HSIA, the operation organization should be considered step-by-step. Especially, the operation system of ground handling should be considered before the operation of passenger terminal 3 and new cargo terminal. In the future, not only the ground handling but also the operation system of whole airport should be take into consideration.

Table 6.4-1 Operation Demarcation of Japan Airport

Airport name	Narita Airport	Haneda Airport	Kansai Airport	Shizuoka Airport
Management method	Airport managed by private company	Airport managed by government	Airport managed by concession system	Airport managed by local government
Terminal Buildings	Owner: NAA Operator: NAA	Owner: JAT Operator: JAT	Owner: NKIAC Operator: KAP	Owner: Private company Operator: Private company
Cargo Facilities	Owner: NAA Operator: Third party	Owner: Third party Operator: Third party	Owner: NKIAC Operator: Third party	Owner: Third party Operator: Third party
Ground handling service	Owner: Third party Operator: Third party	Owner: Third party Operator: Third party	Owner: Third party Operator: Third party	Owner: Third party Operator: Third party
Basic Facilities (R/W, T/W, Apron)	Owner: NAA Operator: NAA	Owner: Government Operator: Government	Owner: NKIAC Operator: KAP	Owner: Local government Operator: Local government
Hydrant Fuel Supply Facilities	Owner: NAA Operator: NAA	Owner: Third party Operator: Third party	Owner: NKIAC Operator: KAP	—
NAVAIDS (Radio, Airfield Lighting)	Owner: NAA Operator: NAA	Owner: Government Operator: Government	(Radio) Owner: Government Operator: Government	Owner: Local government Operator: Local government
			(Airfield Lighting) Owner: KAP Operator: KAP	
Air Traffic Control	Owner: Government Operator: Government	Owner: Government Operator: Government	Owner: Government Operator: Government	Owner: Government Operator: Government

* NAA: Narita International Airport Corporation
 JAT: Japan Airport Terminal Co.Ltd
 NKIAC: New Kansai International Airport Company
 KAP: Kansai Airports
 Third party: Companies other than airport operator and government
 JAT: Japan Airport Terminal Co., Ltd.

Source: JICA Study Team

6.4.2 Multiple Ground Handling Firms Operate at the Airport

It is a custom in Bangladesh that airlines that commitioned Biman Airlines to ground handle their aircraft, to take responsibility of outsourcing . On theother hand, Biman Airlines is responsible for its operation. Also, airlines are demanding “safe handling”, “high quality handling” and “suitable cost” to their outsourcing ground handling company. It is common for international airport to let multiple private commaniest to compete each other fairly to satisfy the requests and earn good effect not only to the airline but also the airport operator and passenger.

In other airports, there are mulptle private ground handling companies operating. Few examples are shown in Table 6.4-2.

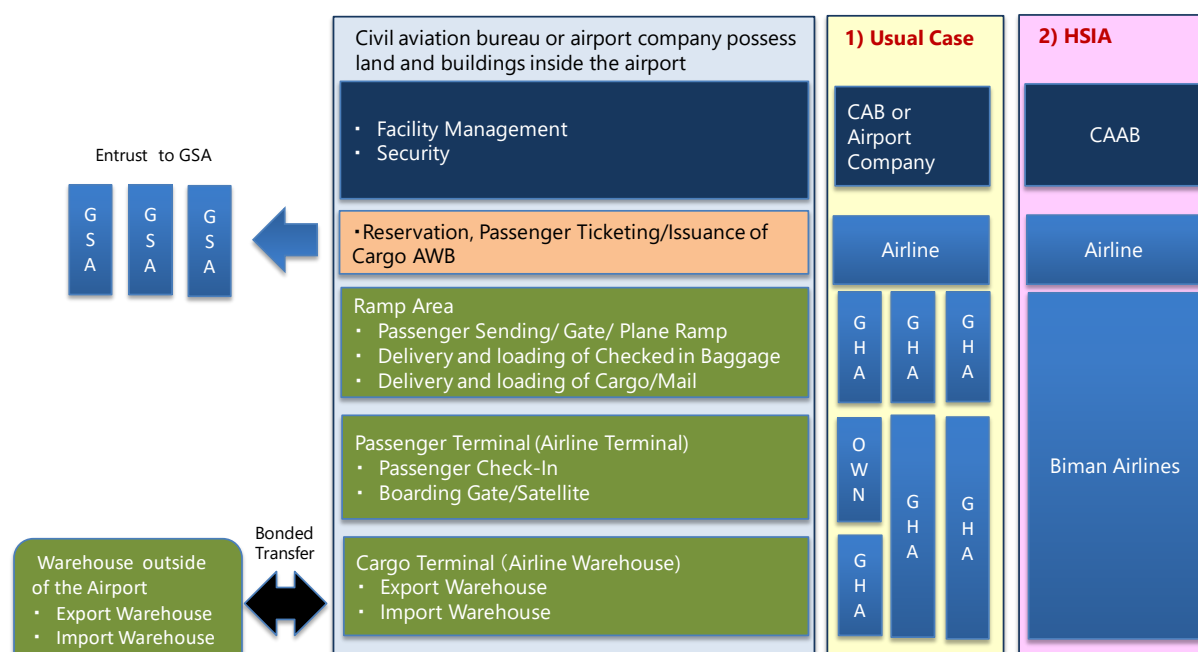
Table 6.4-2 Number of Private Ground Handling Company at the Other Airports

Airport	Suvarnabhumi Airport	Ninoy Aquino Airport	Narita Airport	Chubu Airport
Location	Bangkok	Manila	Narita	Nagoya
Ground Handling	2 leading private companies	4 leading private companies	3 leading private companies (including cooperative companies, it will be 60)	4 leading private companies
Cargo Terminal	2 leading private companies	3 leading private companies	4 leading private companies	4 leading private companies

Source: JICA Study Team

In most of the airports, airline can choose GHA (Ground Handling Agent), e.g., Chubu airport smaller than HSIA has four GHAs. GHA companies develop safety, quality and fare price through friendly competition. As a result, passengers and cargo users of the airport benefit comfort and friendliness and convenience which mechanism sharpens competitive edge of world airports.

However, in HSIA, this mechanism does not work and that becomes obstacle for growth. When Biman Airlines becomes competitive through JICA technical cooperation, it supposed to allow entry of GHA for the brilliant future growth of HSIA.



Source: JICA Study Team

Figure 6.4-1 Comparison of Ground Handling Operator