

ICN Baggage Handling System Optimization & Automation

ICAO AOPSG8



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WE CONNECT LIVES, CULTURES AND THE FUTURE

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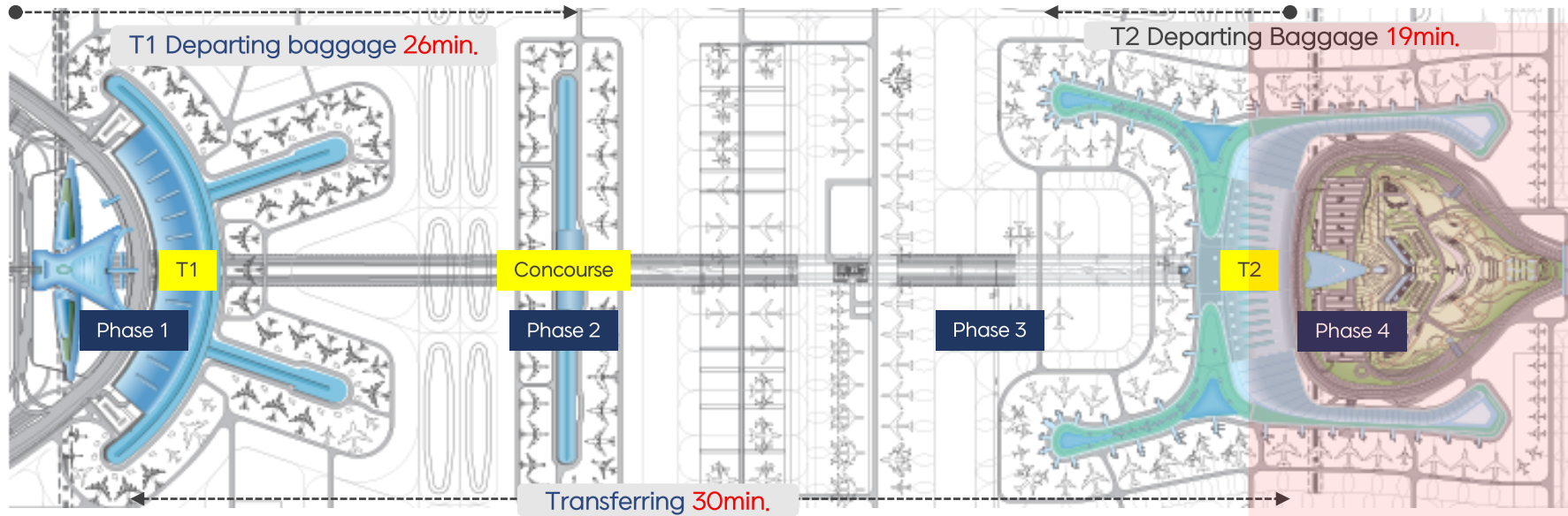
Terminal 1



01

ICN Baggage Handling System

ICN Baggage Handling System



Items	Phase 1	Phase 2	Phase 3	Phase 4	Total
Completion Year	2001	2008	2017	2024	-
Construction Price	116 million USD	259 million USD	157 million USD	266 million USD	798 million USD
Work Scope	T1 building	T1 building, Tunnel(T1↔Concourse) and Concourse	T2 building South wings, Tunnel(Concourse↔T2)	T2 building North wings	-
Baggage System	Belt Conveying System Tilt Tray Sorters	Belt Conveying System Individual Carrier System	Belt Conveying System Individual Carrier System, Tilt Tray Sorters	Belt Conveying System Individual Carrier System, Tilt Tray Sorters	-
Conveying Lane Stretch	21 km	67 km	53 km	43 km	184 km
Maximum Throughput	27,642 bph	21,930 bph	19,040 bph	21,760 bph	-

ICN Baggage Handling System

Operation Capacity

Unit : Bags Per Hour

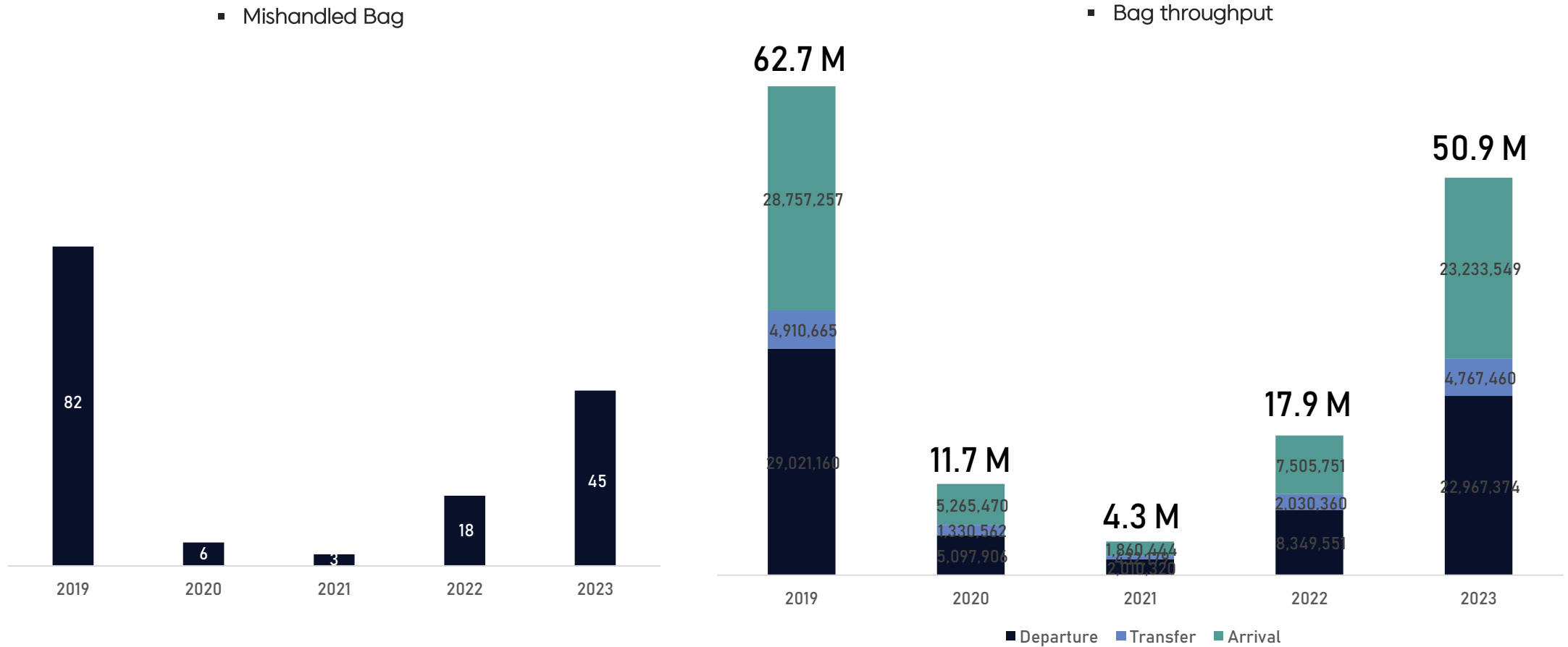
Items	T1 Phase 1	T1 & Concourse Phase 2	T2 Phase 3	T2 expansion Phase 4	Grand Total
Departure	7,140	5,100	5,250	5,610	23,100
Transfer	4,590	4,590	1,550	3,910	14,640
Arrival	15,912	12,240	12,240	12,240	52,632
Total	27,642	21,930	19,040	21,760	90,372

System Facilities

Items	T1 Phase 1	T1 & Concourse Phase 2	T2 Phase 3	T2 expansion Phase 4	Grand Total
Check-in Counters	263	114	220	148	745
Departure Makeups	50	34	34	54	172
Transfer Inductions	10	8	8	6	32
Reclaim Carousels	27	-	12	10	49
Arrival Inductions	30	22	22	22	96

ICN Baggage Handling System

Performance

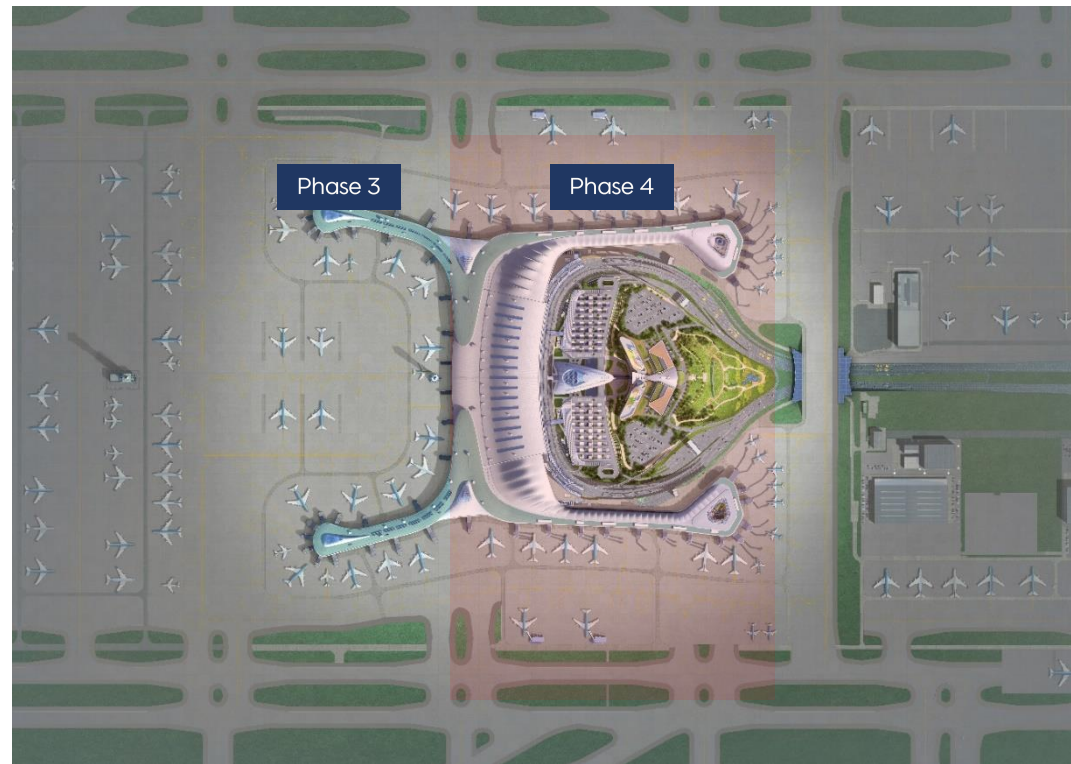


ICN Baggage Handling System

Challenge of Integration Phase3 & Phase4

Circumstance	Phase4 construction is about extending Terminal 2, which means current system also is necessary after completion
Goal	Conducting successfully Both operation of current system and integration of current and new systems by close coordination of construction and operation parts

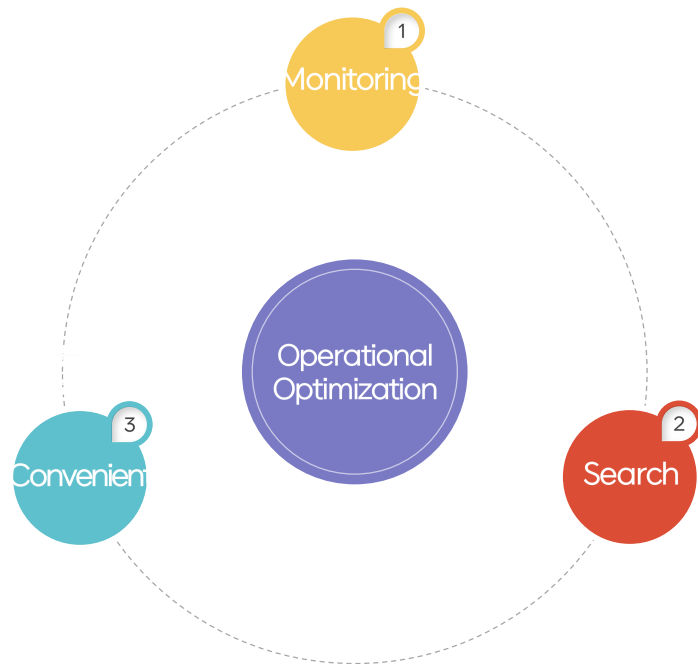
Day Time
- Phase3 Operation



Night Time
- Integration of
Phase3 and Phase4

02 Optimization

Optimization



01

Integrated System Monitoring

Intuitive and integrated information displaying

(Solution) baggage flow and traffic status, System loading and usages
(purpose) Surveillance, Status monitoring of system, Alarming

02

Baggage Tracking and Searching

Searching bag data to figure out the trouble during baggage journey

(Solution) Bag Tracking searching System

(purpose) check out the bag tracking under trouble circumstances

03

Convenient process to figure out bag's position

Providing real-time based bag position in the system

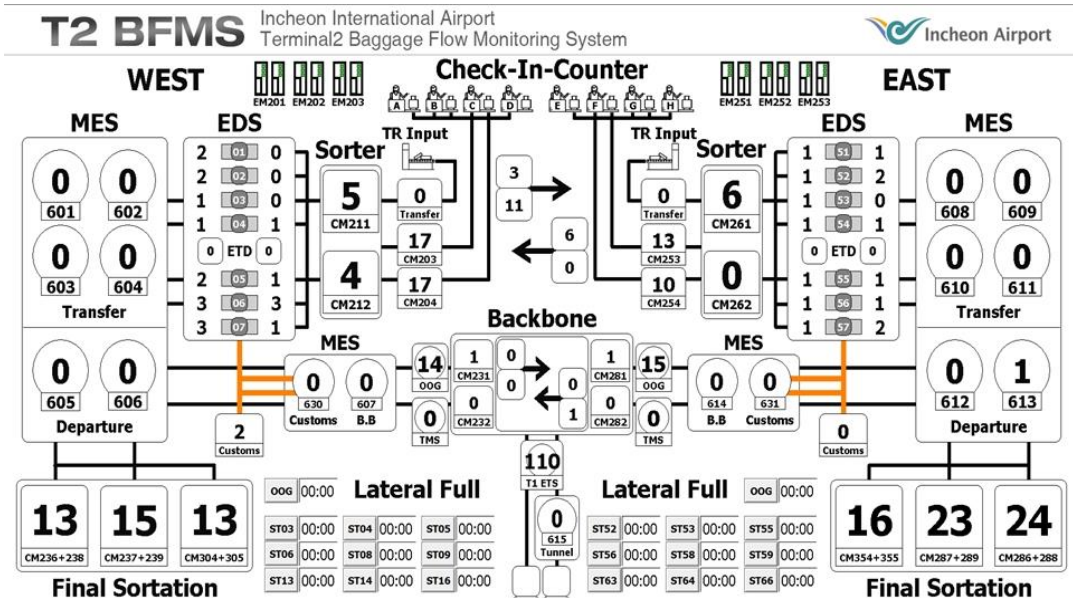
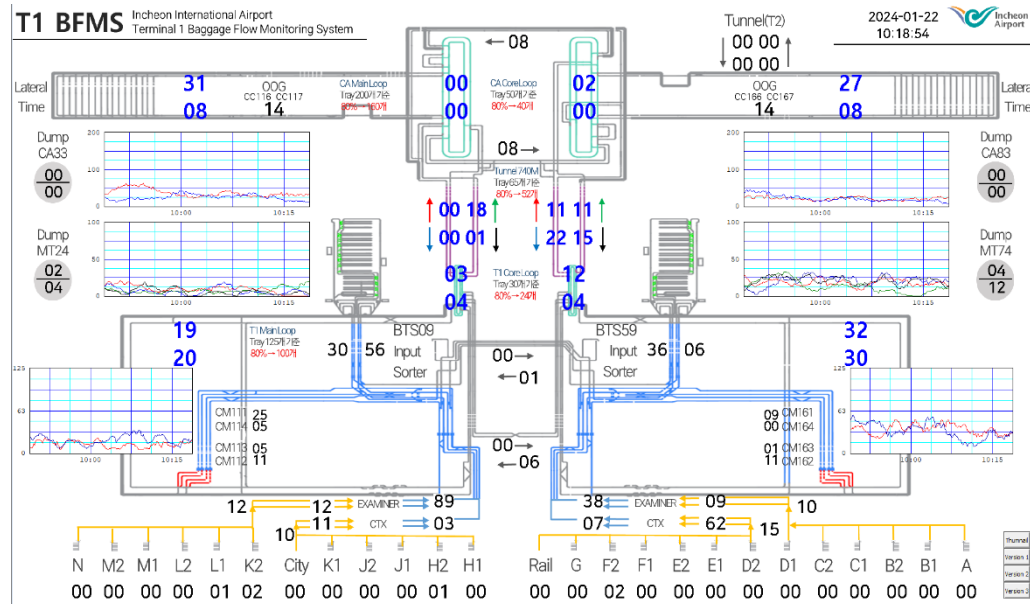
(Solution) Baggage Positioning System

(purpose) convenient and efficient bag search process for ground handlers

Integrated System Monitoring

01

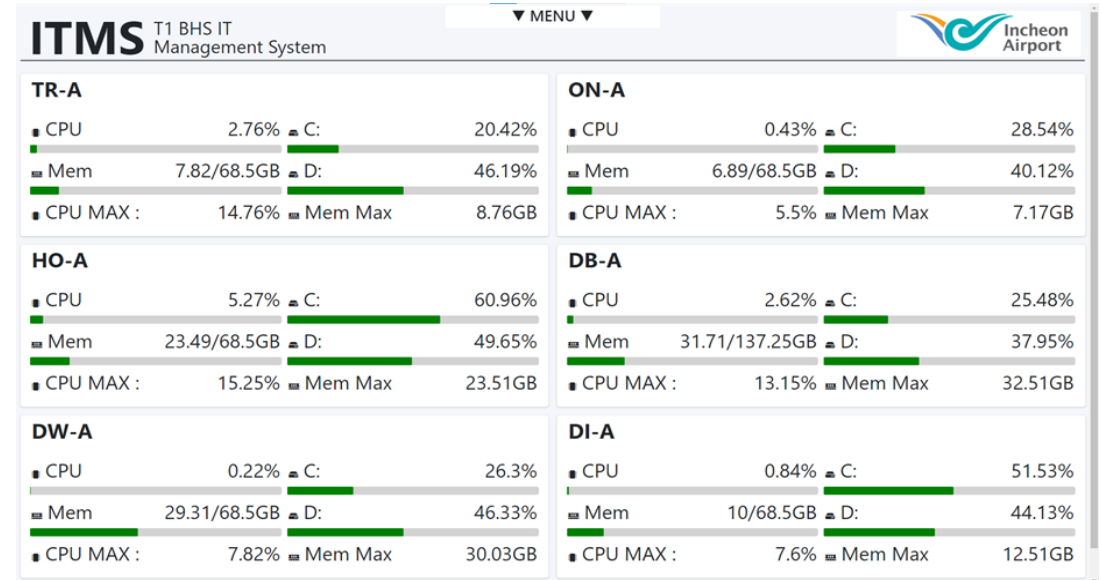
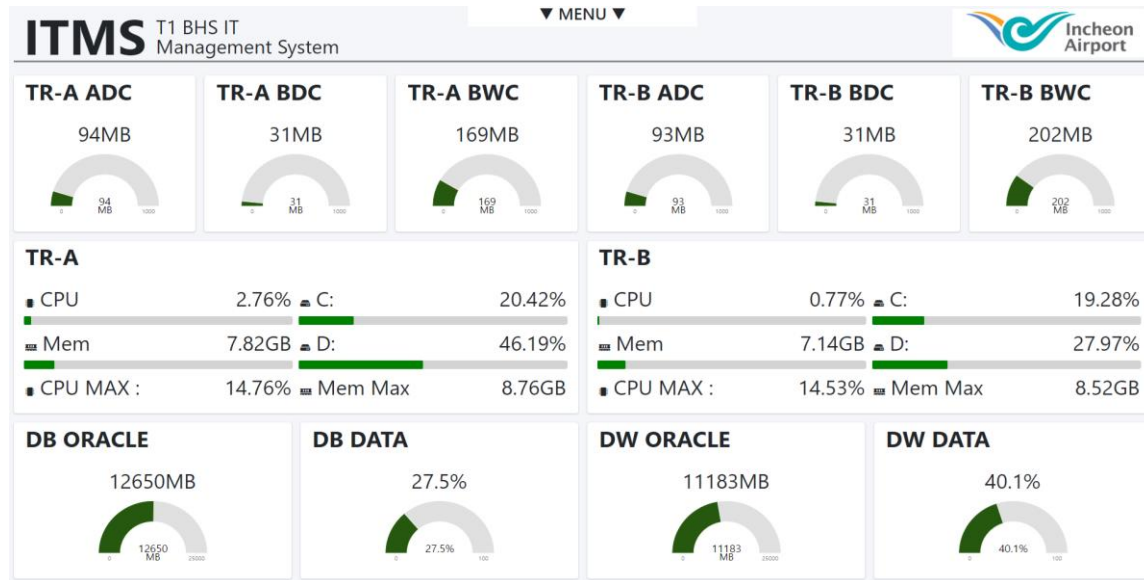
Baggage Flow Monitoring System(BFMS)



- (Background) Emergency response is essential when there is a sudden increase in the inflow of baggage or an abnormal flow situation, necessitating real-time monitoring of the overall baggage flow conditions.
- (Solutions) Monitoring solution providing real-time information on baggage flow and load within the primary main conveyor lines of BHS
- (Implications) Constant monitoring of baggage flow at crucial conveyors enables proactive and rapid response to events
Rapid identification of peak-time load distributions allows for smooth luggage handling and prevents delays in processing.

Integrated System Monitoring

02 Integrated Total Monitoring System(ITMS)



Monitoring

Real-time server status based monitoring as to detect immediate errors or malfunctions

Alert function

Alarms displayed when the load exceeds the setup capacity

Baggage Tracking and Searching

01 Baggage Tracking System(BTS) – Fallen Baggage & problem baggage

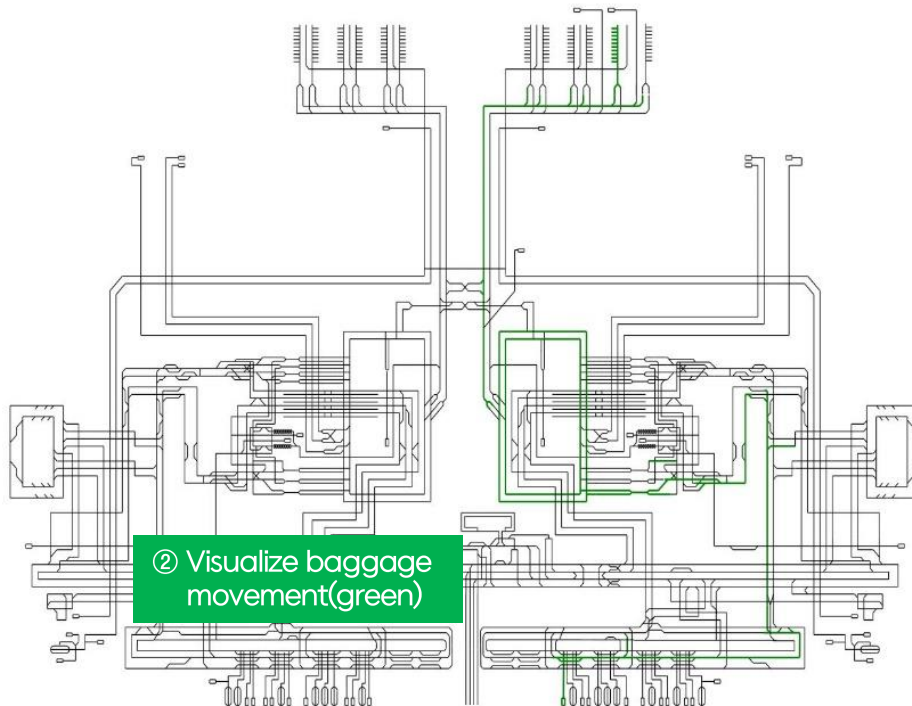
Background

Required the needs for finding the baggage location when occurred in problems or lost

Solution

Developing the tracking system that allows showing it's trace and visual information to find the location quickly

BTS Baggage Tracking System



① Entering the Tag numbers

01268207 검색 조회

DIS / GA0871 / 2023-01-23 오전 11:35:00

eventTime	NPIName	NPID	Trayid	CCTVName	DPName
1/23/2023 10:04:55 AM	CM253.BID51_B5001	4011	0	3438	SL1_East
1/23/2023 10:04:59 AM	CM253.BID51_B5001	40020	0		SL1_East
1/23/2023 10:06:07 AM	CM253.BID51_B5001	4017	0	3672	SL1_East
1/23/2023 10:06:13 AM	CM253.BID51_B5001	20001	0	3672	SL1_East
1/23/2023 10:09:23 AM	CM253.BID51_B5001	20001	0	3672	SL1_East
1/23/2023 10:09:23 AM	CM266.B5C57_B5017	4028	0		SL1_East
1/23/2023 10:09:23 AM	CM266.B5C57_B5017	4028	0		SL1_008
1/23/2023 10:09:28 AM	CM266.B5C57_B5017	4028	0		SL1_003
1/23/2023 10:09:42 AM	CM266.B5C57_B5017	4028	0		Customs_Passenger_E
1/23/2023 10:09:45 AM	CM266.B5C57_B5025	5108	0	3095/3090	Customs_Passenger_E
1/23/2023 10:09:51 AM	CM266.B5C57_B5025	5108	0	3095/3090	ST66
1/23/2023 10:10:30 AM	CM266.B5C57_B5030	20014	0	3152	ST66
1/23/2023 10:10:41 AM	CM266.B5C56_B5301	30032	0		ST66
1/23/2023 10:10:58 AM	CM273.B5C56_B5055	20035	0		ST66
1/23/2023 10:11:06 AM	CM273.B5C56_B5067	4039	0	3151	ST66
1/23/2023 10:11:11 AM	CM273.B5C56_B5067	4501	20380	3160	ST66
1/23/2023 10:11:33 AM	CM273.B5C56_B5067	20119	20380		ST66
1/23/2023 10:11:45 AM	CM273.B5C56_B5067	30146	20380		ST66
1/23/2023 10:12:00 AM	CM273.B5C56_B5067	20091	20380		ST66
1/23/2023 10:12:16 AM	CM273.B5C56_B5067	20151	20380		ST66
1/23/2023 10:12:32 AM	CM273.B5C56_B5067	20258	20380		ST66
1/23/2023 10:12:35 AM	CM286.BF551_H5009	20290	20380	3251	ST66
1/23/2023 10:13:21 AM	CM286.BF551_H5043	19143	20380		ST66
1/23/2023 10:13:21 AM	CM286.BF551_H5043	19143	20380		ST66
1/23/2023 10:13:22 AM	CM286.BF551_H5047	20263	20380		ST66

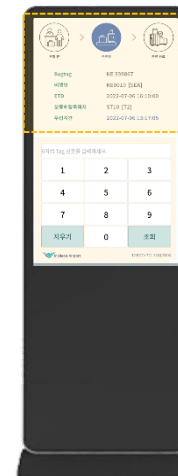
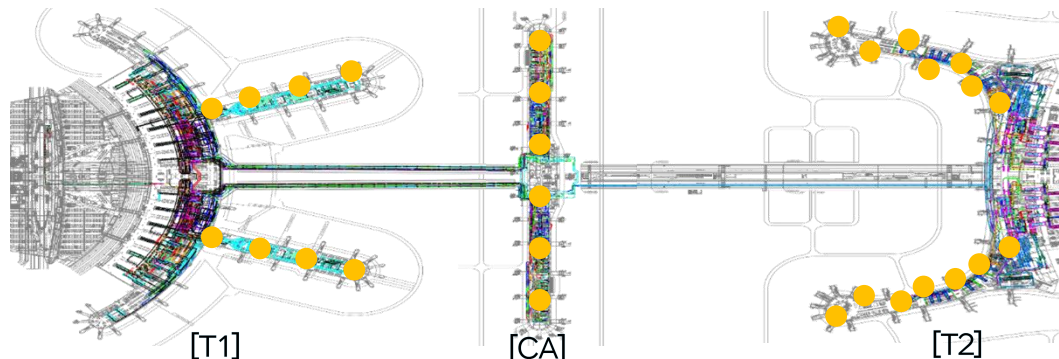
③ Combination of movement route & CCTV information → shortening the time required for CCTV inquiry



Convenient process to figure out bag's position

01 Baggage Positioning System(BPS)

Background	Increasing convenience for searing baggage in the system and efficiency in workload at BHS operations center by minimizing the call response task
Solution	Development the service that allows ground handlers to retrieve the real time based baggage tracking log from the baggage makeup hall
Installation	Total 35 units installed at baggage makeup hall



0180742890	Search	T2 BOC : 741-3101 T2 BMC : 741-3750
		
투입 전	EBS 저장	분류 완료
Bagtag	0180742890	
비행편	KE0011	
ETD	2022-03-23 20:30:00	
분류예정목적지	ST11	

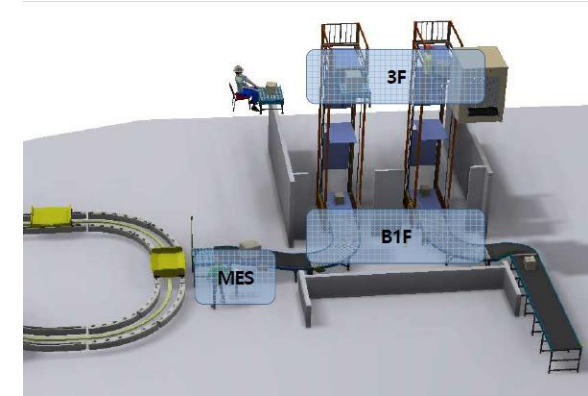
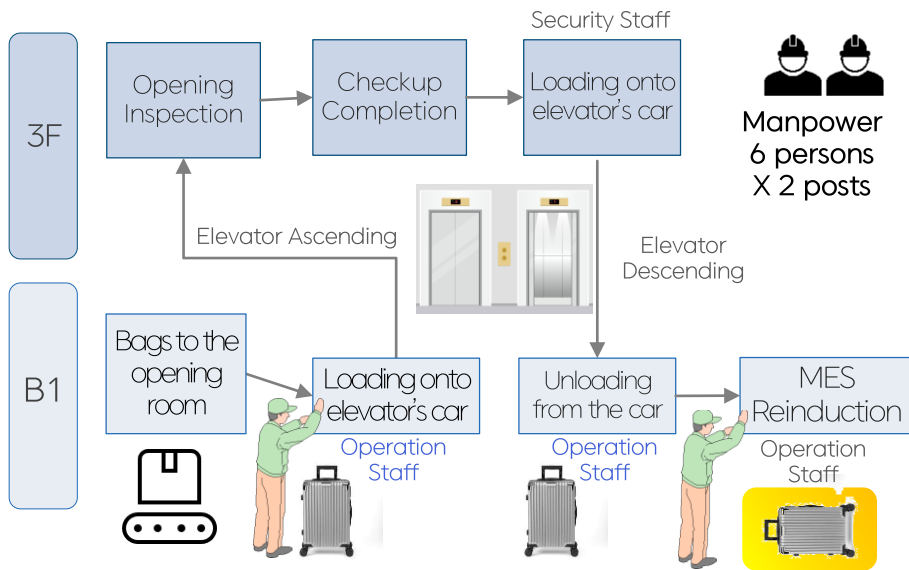
		
투입 전	분류중	분류 완료
Bagtag	KE 335801	
비행편	KE0023 [SFO]	
ETD	2022-07-06 16:00:00	
분류목적지	ST62 [T2]	
분류시간	2022-07-06 13:04:11	

03

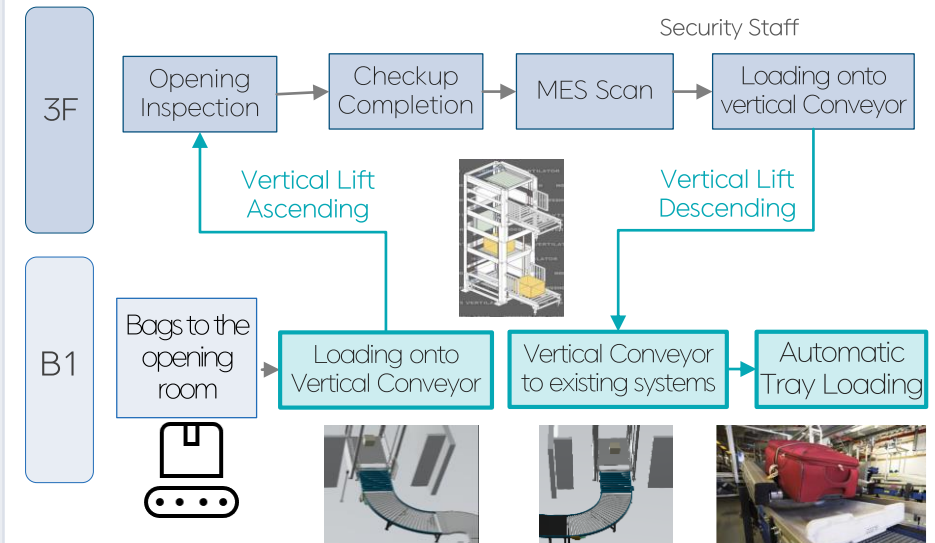
Automation

T2 Baggage Opening Inspection Process

+ AS-IS Lifting to Baggage Opening Inspection by elevator

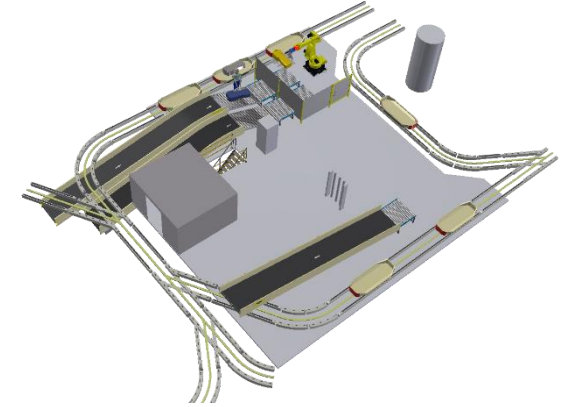
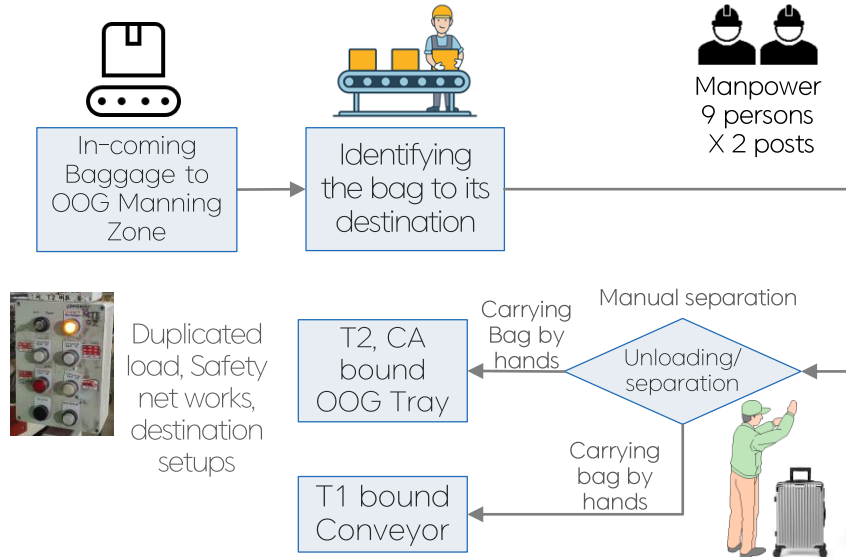


+ TO-BE Lifting automation by vertical Conveyors

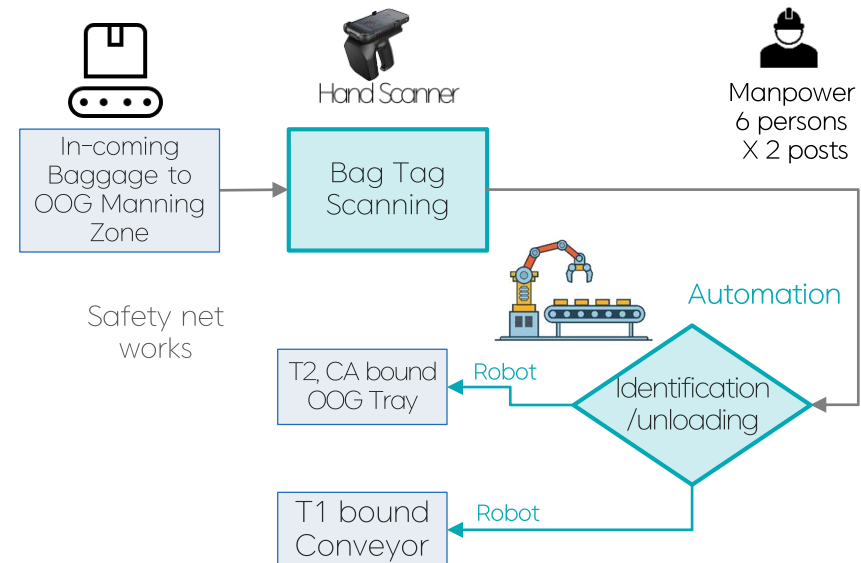


T1 OOG Baggage Handling

+ AS-IS Manual identifying handling process



+ TO-BE Automatic robot handling process





THANK YOU

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