Integrated Platform for Port Logistics Information Share

CHAINPORTAL

recognized by the World Bank as
an excellent Port Community System

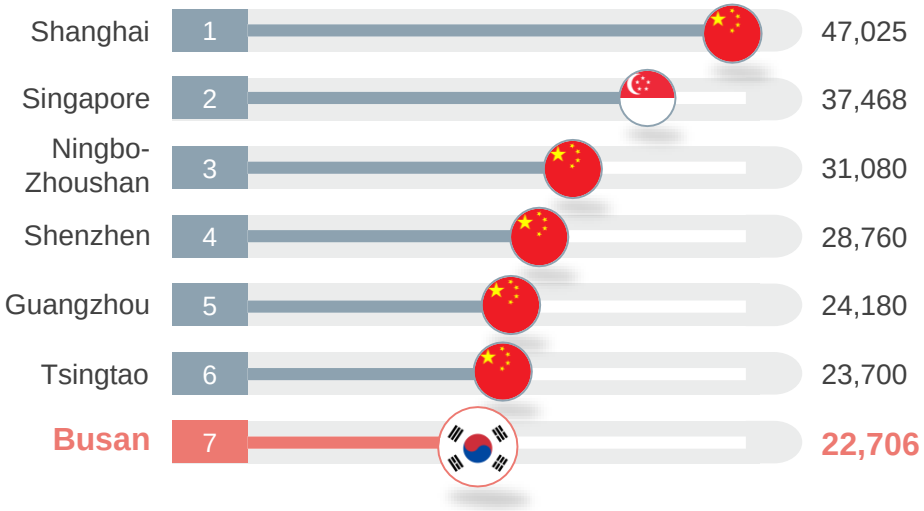
Busan Port's Competitiveness

Based on a network connecting more than 500 ports in over 150 countries around the world, Busan Port has grown to become the world's **second busiest transshipment hub** with an annual transshipment volume of 12.27 million TEUs and **the seventh largest container port** in the world handling 22.71 million TEUs.

In order to secure its global competitiveness, it is crucial for Busan Port to enhance transshipment competitiveness and improve port productivity.

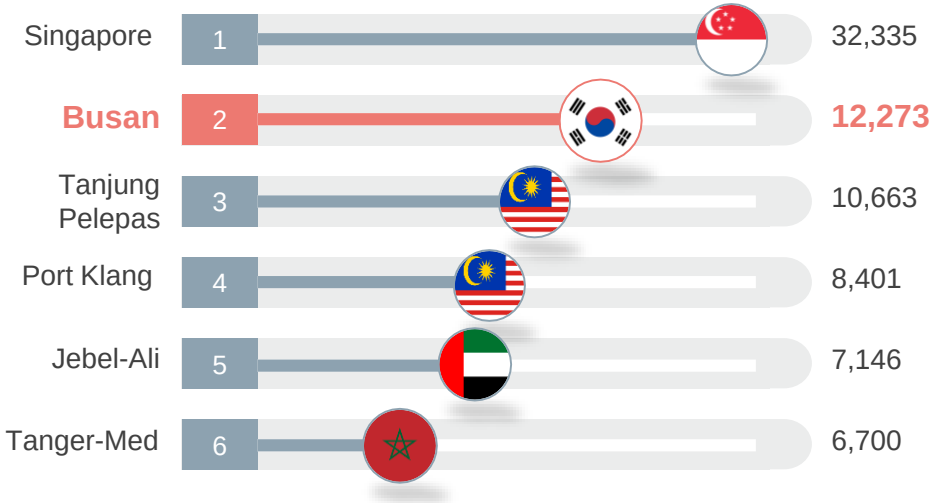
Ranking for global port container traffic 7th

(in thousand TEUs)



Ranking among the world's busiest transshipment ports 2nd

(in thousand TEUs)

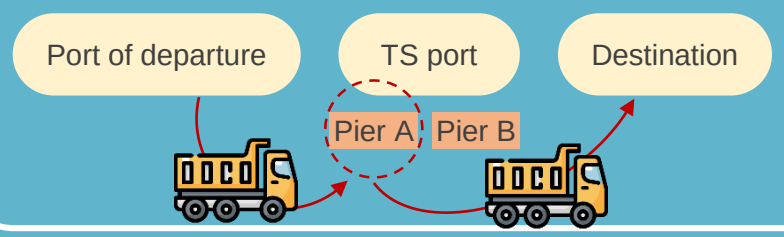


Trans Shipment

The process of moving cargo at a transshipment port if there is no direct route to a desired destination

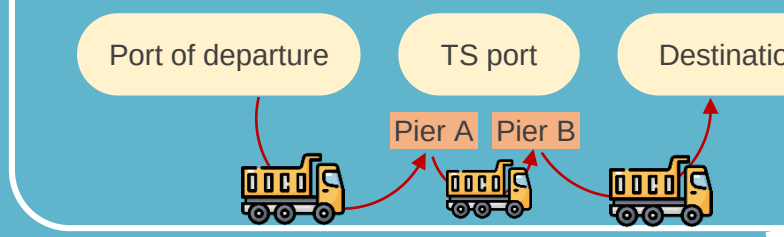
Intra-terminal transshipment

Transshipment within the same pier



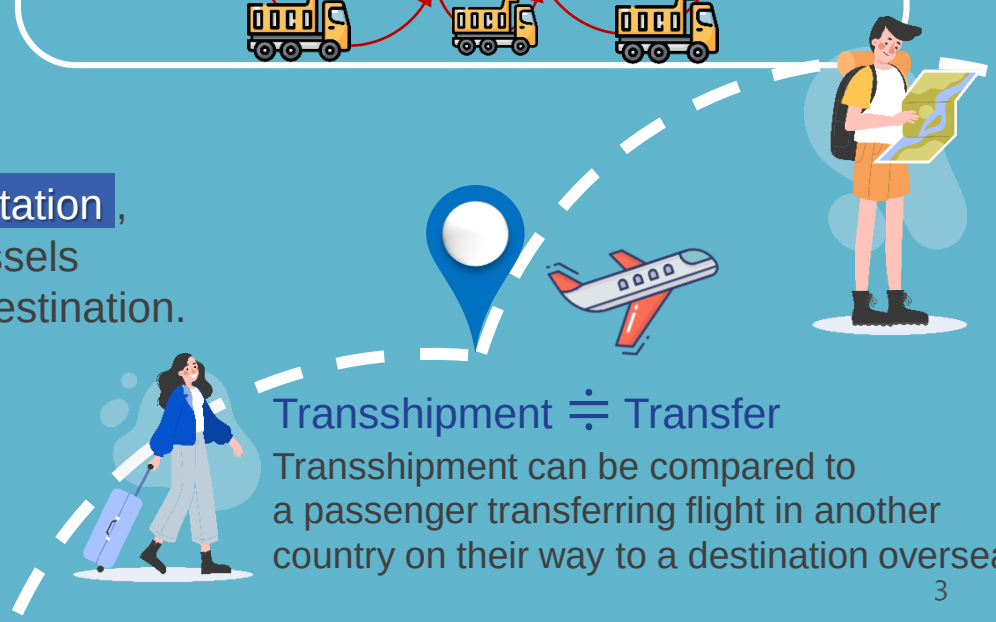
Inter-terminal transshipment

Off-loading and loading at different piers



What is ITT?

ITT refers to Inter-terminal transportation, where cargo is moved between vessels at a port of call that is not its final destination.



Transshipment ≒ Transfer

Transshipment can be compared to a passenger transferring flight in another country on their way to a destination oversea.

At Busan Port, ITT is inevitable

We must continue to develop its efficiency and convenience

Cause 1

Busan Port has nine terminals, each run independently by individual terminal operators.

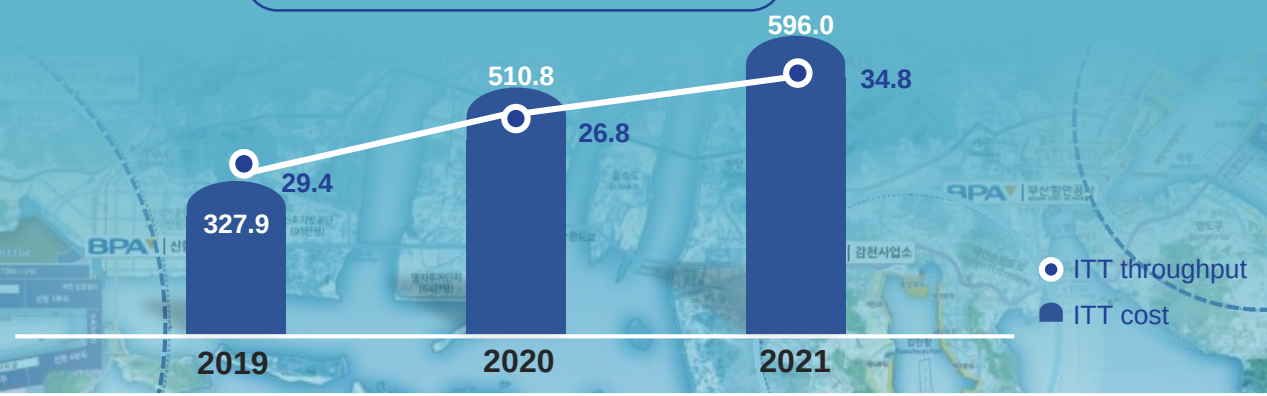
Cause 2

While alliances between container carriers exist to improve operation and cost efficiencies, container carriers will often utilize terminal outside of these alliances for their own service.

Growing need to reduce additional hours and cost arising from transshipment

ITT volume/cost at Busan Port

*in thousand TEUs/ USD million



An Integrated platform for the sharing of port logistics-related information, to enhance the competitiveness of Busan Port's transshipment and export/import

CHAINPORTAL

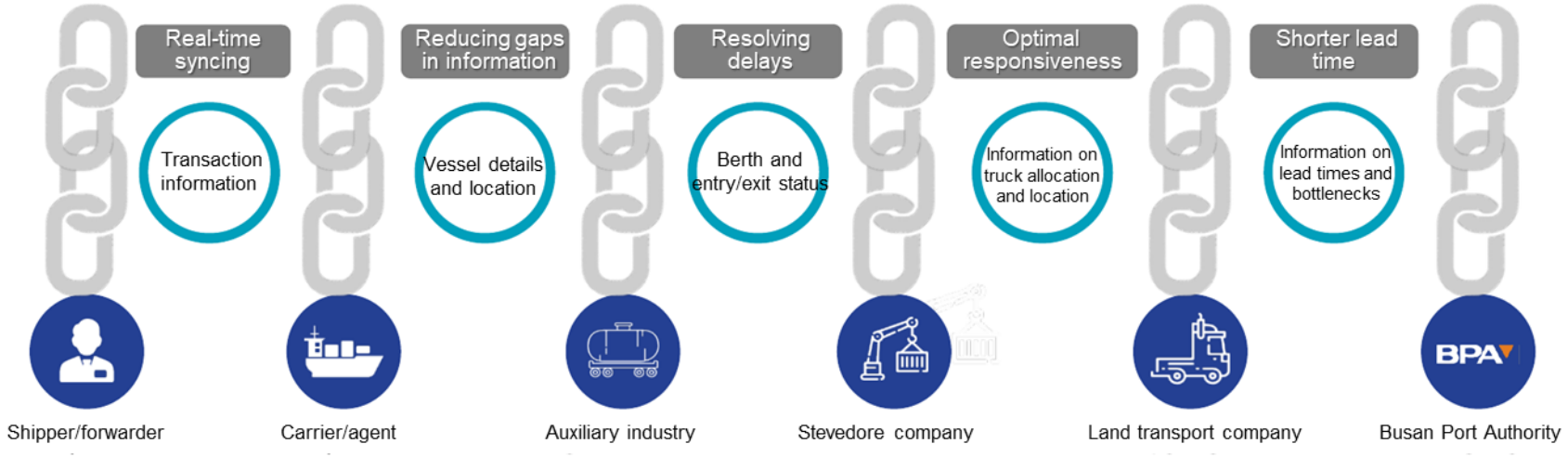
Project Overview

CHAINPORTAL

Integrated Platform for Port Logistics Information share

System overview	Blockchain-based real-time information sharing among port stakeholders to enhance port competitiveness and productivity
Major goals	• To increase work efficiency of port logistics companies through real-time information sharing • To raise port operation productivity • To support port logistics businesses in the private sector by disclosing port information
Strengths	• Higher security using blockchain technology • Efficient support for container transportation through group orders and TS monitoring

Integrated Chain Portal Platform



Key services

- Integrated Information System (IIS)
- Transshipment Shuttle System (TSS)
- Vehicle Booking System (VBS)

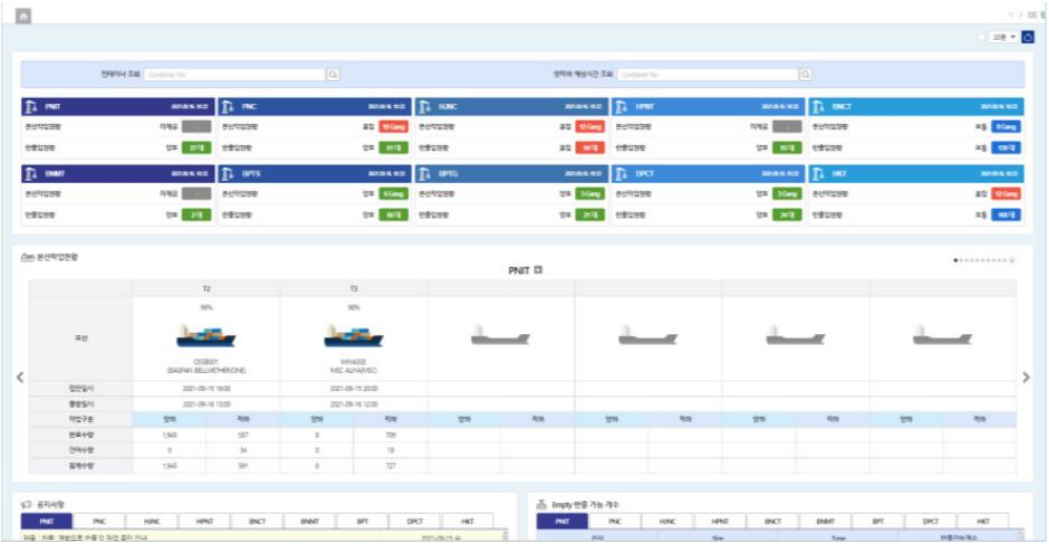
Additional services

- Port Administration Support System
- Busan Port Statistics
- Port Industrial Park System
- Disaster Safety System
- Communication/ Collaboration Service
- Busan Port Big Data Service

IIS, Integrated Information Service

Real-time monitoring of information regarding the New Port's six terminals and the North Port's three terminals

Integrated Information Service



Key items on the menu

Terminal congestion	Shipment cancellation list	Advance check-in /check-out inquiry
Berth allocation status	Entry progress, volume inquiry	Dangerous articles entry report inquiry
Stevedoring status	Past-due storage status	Trxn statement inquiry
Loading/discharging list	Container information inquiry	M.V. code
CLL yard comparison	Empty container statuses	CCTV traffic info.
Exclusion list	Container location inquiry	TS berth schedule monitoring
Inclusion list	Booking inquiry	

IIS deployment (target terminals)

New Port: PSA PNIT, Pusan Newport Company, 한진부산컨테이너터미널 HANJIN BUSAN NEWPORT CO., HPNT, BNCT, BNMT

North Port: HUTCHISON PORTS BUSAN, BPT 부산항터미널주식회사 감만터미널, BPT 부산항터미널주식회사 신선대터미널, Dongwon 동원부산컨테이너터미널

Open API

▶ Local citizens can access information on a public data platform run by the Ministry of the Interior and Safety.

TSS, Transshipment Shuttle System

The World's first Transshipment Shuttle System (TSS)

for low-cost, high-efficiency transport of transshipment cargo between piers at Busan Port

Maximizing efficiency of transshipment cargo transportation, via the advance linking of terminal and forwarder information and enabling group orders

Reduced working time & **Higher backhaul transport rate**

process

1. Forwarder: Transmission of truck allocation information (group)
2. Platform: Sending truck allocation information to terminal
3. Truck: Arrival at Terminal A
4. Terminal A: Loading onto most suitable container
5. Truck: Arrival at Terminal B
6. Terminal B: Unloading onto most suitable container
7. Platform: Automatic allocation of next task
8. Terminal B: Loading onto most suitable container

Key features

Group orders
Group multiple containers and trucks, and transmit information directly

Automatic truck allocation
Transmits following order via mobile app upon the completion of cargo transport

Priority adjustment
Easily-adjustable group order priority

*Group order feature enables users to group multiple trucks and multiple containers, and matches trucks with the most suitable container upon its arrival at a terminal, enabling swift check-out

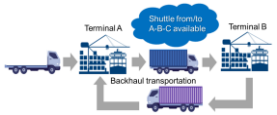
System effect

Minimizing re-working

AS-IS	TO-BE
Re-working inevitable due to individual order	Grouping of orders, allocating cargoes from the top

Higher backhaul transport

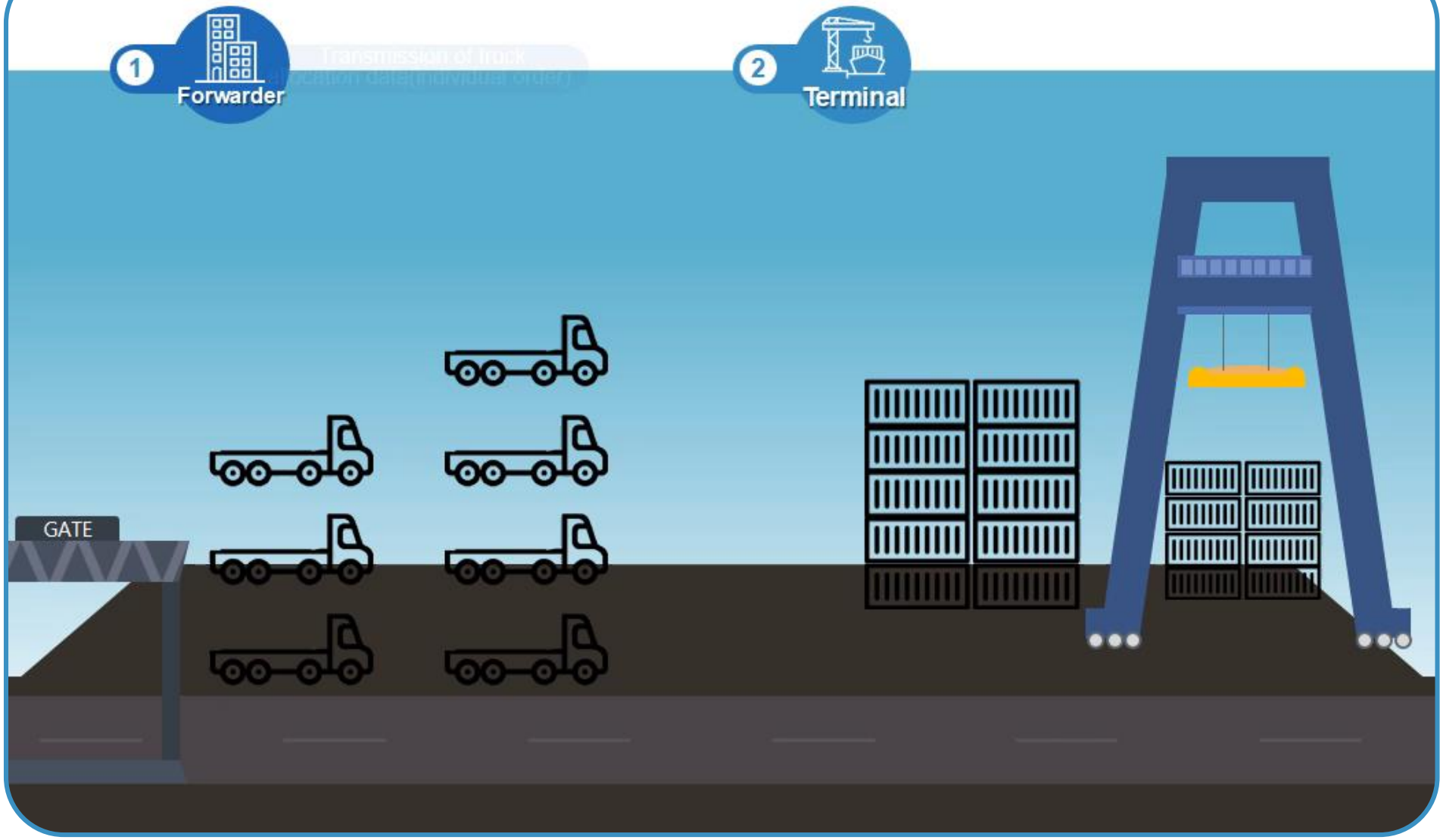
AS-IS	TO-BE
Manual truck allocation and one-way transport	Automated truck allocation and round transport (high backhaul rate)



(TSS, Transshipment Shuttle System)

As-Is

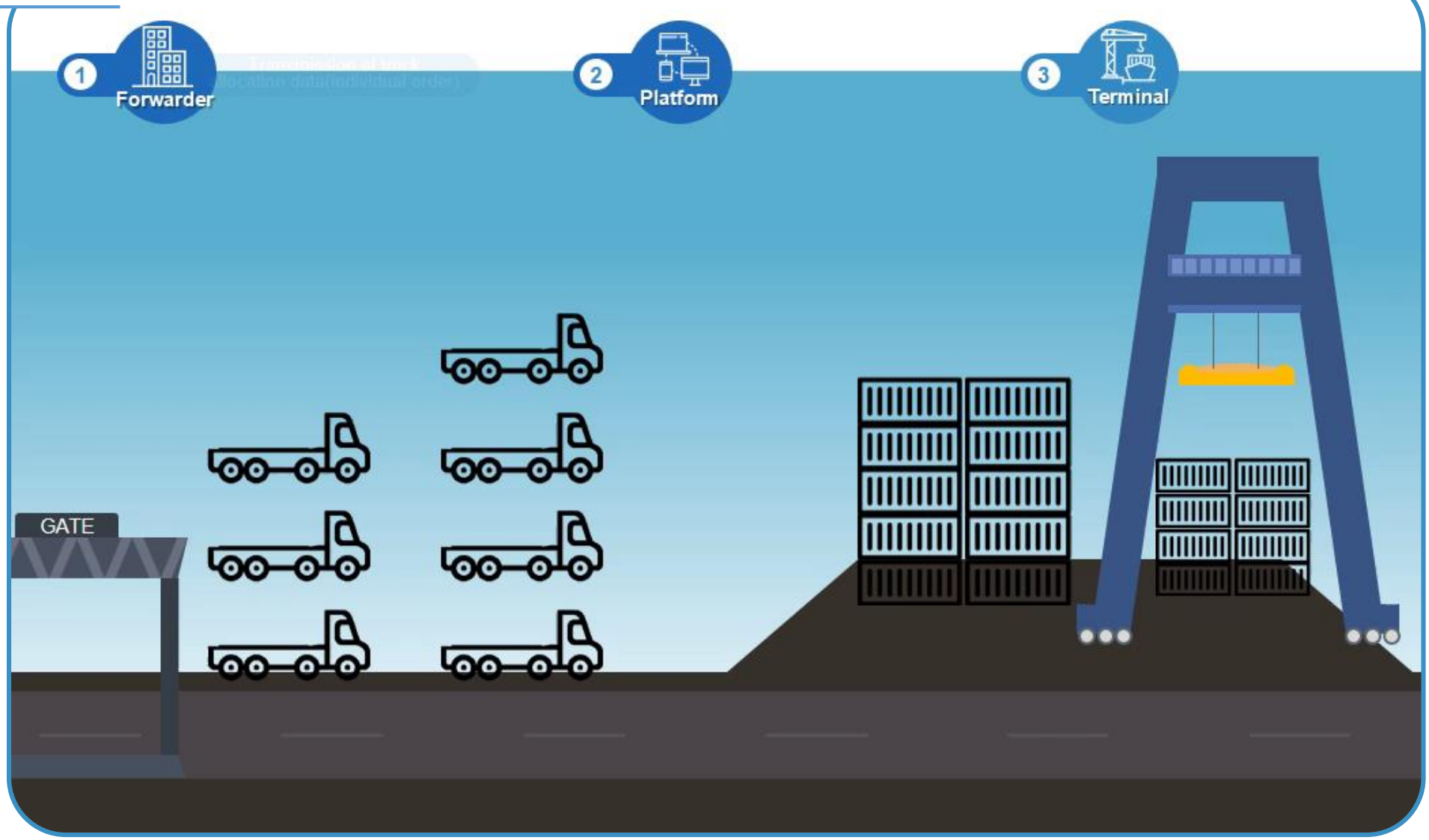
(This page will be submitted as a video)



(TSS, Transshipment Shuttle System)

Improvements

(This page will be submitted as a video)



Key Service 02

TSS, Transshipment Shuttle System

Achievemei **When using the group order function, truck waiting times decreased by 25%**

* (comparison in the same hour)
group order truck (19.1 min.), non-group order truck (25.7 min.)

[Pilot period]

Nov. 24, ~ Dec, 23, 2022
(30 days)

[Participants]

Three terminal operators
(Piers 1, 3, and 4 of the New Port)
Two forwarders (Lotte Global Logis & Hanjin)

[Cargo volume]

11,609 boxes (exceeding target)
(target volume) 9,866 boxes
(30% of the entire transshipment volume)

Expected benefits

Carrier

- More efficient transshipment
- Shorter pier-to-pier connection time

▼

Higher TS schedule reliability (higher service quality)

Terminal operators

- Minimum cargo re-working
- Higher yard productivity

▼

Increased unloading productivity (higher revenue & profit)

Forwarder

- More efficient truck allocation
- Higher backhaul transport rate

▼

Higher hourly throughput (higher revenue & profit)

Truck driver

- Shorter truck waiting time
- Higher backhaul transport rate

▼

Higher hourly throughput
Less energy-consuming for truck drivers

Attracting addition routes of global carriers and handling additional TS cargo by enhancing TS competitiveness

Adding TS-related values

5% increase in TS cargo raises Busan Port's added value by **USD 66.5M per year**

Lower TS shuttle cost

50% increase in truck backhaul transport saves pier-to-pier shuffle costs by **USD11.2M per year**

VBS, Vehicle Booking System

Introducing **Korea's first** Vehicle Booking System (VBS)

to address bottlenecks at specific time and enhance efficiency by rearranging cargo in advance

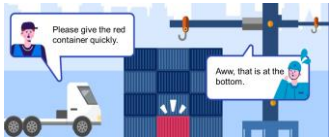
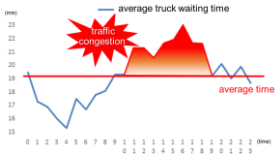
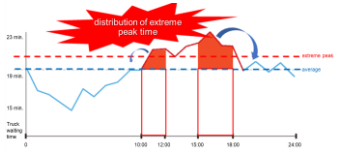
Based on a booking platform, encouraging trucks to check-in off-peak time, leading to

Higher operational efficiency & **Shorter truck waiting Time**

Work process

1. Terminal — Allocating cargo available for booking
2. Forwarder Truck — Booking arrival time
3. Terminal — Rearranging cargo
4. Terminal Truck — Working first on cargo arriving on time

Impact

	AS-IS	TO-BE
Minimizing re-working	inevitable re-work of cargo during the peak times	Rearranging cargo prior to booking means workload can be distributed
		
	(With no pre-booking) Re-working of cargo begins when trucks check into the terminal without booking.	(With pre-booking) Arranging of cargo according to sequence of orders using non-peak hours
Distributing peak times	Yard congested due to the concentration of trucks during the peak hours	Introduction of a slot system to distribute extreme peak time
		
	(Peak time) Check-in/check-out concentrated within weekday daytimes, limiting yard productivity and discharging from vessels	(Slot system) Distributing concentration by adjusting booking slots per hour (cap on the number of trucks)

Key Service 03

VBS, Vehicle Booking System

Achievements

System subscribers
(truck driver)

746pax → **2,919pax**
2021 2022

No. of operations via booking system

1,620 → **4,866**
2021 2022

Shorter truck waiting time within terminal

Down by 15.3%

no booking 25.4 min. / booking 21.5 min.

Expected benefits

Carrier
- Shorter loading time for import/export
- Higher productivity in loading

▼ **Better schedule reliability**

Terminal operator
- Distribution of the peak time
- Addressing yard congestion

▼ **Increase productivity in unloading and terminal operation**

Forwarder
- Shorter working periods
- More efficient truck allocation

▼ **Higher revenue & profit**

Truck driver
- Shorter truck waiting times
- Higher throughput

▼ **Higher profitability**

Raising global competitiveness by enhancing port productivity, and improving port environment by resolving congestion

Direct effects

Increase in terminal revenue

5% increase in productivity enabling higher throughput raises Busan Port's revenue by **USD 42M per year**

Higher income for forwarders, truck drivers

Shorter truck waiting time allowing one additional shuttle operation boosts per-truck income **by USD 24 /day**

Indirect effects

Resolving road congestion around the port area, reducing harmful substances in the city around the port, less road damage, etc.

Mid-to-long term roadmap for Busan Port's Chainportal

Phase 1
2019-2020

Laying the groundwork
for integrated platform for port logistics information

ITT transport system, information inquiry service, Open API, etc.

Phase 2
2021-2022

Creating
Integrated platform for port logistics information

Truck check-in/check-out booking system, Integrated mobile app, etc.

Phase 3
2023-2025

Disseminating
Integrated platform for port logistics information

Implementing in other ports in Korea.

Phase 4
2026-2028

Upgrading
integrated platform for port logistics information

Upgrading AI-powered features of the integrated platform for port logistics information

Busan Port will lead the new waves of
digitizing port logistics information in
line with the fourth industrial revolution.