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**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Port</th>
<th>Volume (in thousand TEUs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shanghai</td>
<td>47,025</td>
</tr>
<tr>
<td>2</td>
<td>Singapore</td>
<td>37,468</td>
</tr>
<tr>
<td>3</td>
<td>Ningbo-Zhoushan</td>
<td>31,080</td>
</tr>
<tr>
<td>4</td>
<td>Shenzhen</td>
<td>28,760</td>
</tr>
<tr>
<td>5</td>
<td>Guangzhou</td>
<td>24,180</td>
</tr>
<tr>
<td>6</td>
<td>Tsingtao</td>
<td>23,700</td>
</tr>
<tr>
<td>7</td>
<td>Busan</td>
<td>22,706</td>
</tr>
</tbody>
</table>

**Ranking among the world’s busiest transshipment ports 2nd**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Port</th>
<th>Volume (in thousand TEUs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Singapore</td>
<td>32,335</td>
</tr>
<tr>
<td>2</td>
<td>Busan</td>
<td>12,273</td>
</tr>
<tr>
<td>3</td>
<td>Tanjung Pelepas</td>
<td>10,663</td>
</tr>
<tr>
<td>4</td>
<td>Port Klang</td>
<td>8,401</td>
</tr>
<tr>
<td>5</td>
<td>Jebel-Ali</td>
<td>7,146</td>
</tr>
<tr>
<td>6</td>
<td>Tanger-Med</td>
<td>6,700</td>
</tr>
</tbody>
</table>
What is transshipment?

**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

Port of departure → TS port → Destination

**Inter-terminal transshipment**

Off-loading and loading at different piers

Port of departure → TS port → Destination

**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 overseas.
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

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

<table>
<thead>
<tr>
<th>Year</th>
<th>ITT Throughput (in thousand TEUs)</th>
<th>ITT Cost (USD million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>327.9</td>
<td>29.4</td>
</tr>
<tr>
<td>2020</td>
<td>510.8</td>
<td>26.8</td>
</tr>
<tr>
<td>2021</td>
<td>596.0</td>
<td>34.8</td>
</tr>
</tbody>
</table>
# Project Overview

## Integrated Platform for Port Logistics Information share

<table>
<thead>
<tr>
<th><strong>System overview</strong></th>
<th><strong>Major goals</strong></th>
<th><strong>Strengths</strong></th>
</tr>
</thead>
</table>
| Blockchain-based real-time information sharing among port stakeholders to enhance port competitiveness and productivity | • 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 | • Higher security using blockchain technology  
• Efficient support for container transportation through group orders and TS monitoring |

## Integrated Chain Portal Platform

![Diagram of Integrated Chain Portal Platform](image)

### 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
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**

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

**IIS deployment**

- New Port
- North Port

**Open API**

- Local citizens can access information on a public data platform run by the Ministry of the Interior and Safety.
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. **Transmission of truck allocation information (group)**
   - Forwarder

2. **Sending truck allocation information to terminal**
   - Platform

3. **Arrival at Terminal A**
   - Truck

4. **Loading onto most suitable container**
   - Terminal A

5. **Arrival at Terminal B**
   - Truck

6. **Unloading onto most suitable container**
   - Terminal B

7. **Automatic allocation of next task**
   - Platform

8. **Loading onto most suitable container**
   - Terminal B

**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**

- **AS-IS**
  - Re-working inevitable due to individual order

- **TO-BE**
  - Grouping of orders, allocating cargoes from the top

- **Higher backhaul transport**

**Comparison**

- **AS-IS**
  - Manual truck allocation and one-way transport

- **TO-BE**
  - Automated truck allocation and round transport (high backhaul rate)
Key Service 02
(TSS, Transshipment Shuttle System)

As-Is

1. Forwarder
2. Terminal

(This page will be submitted as a video)
Improvements

1. Forwarder
2. Platform
3. Terminal

Key Service 02
(TSS, Transshipment Shuttle System)

(This page will be submitted as a video)
Key Service 02

TSS, Transshipment Shuttle System

Achievements

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

- **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
  - Less energy-consuming for truck drivers
  - Higher hourly throughput

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 shuttle costs by **USD 11.2M per year**
**Korea’s first Vehicle Booking System (VBS)**

**Introducing** 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. Allocating cargo available for booking (Terminal)
2. Booking arrival time (Forwarder)
3. Rearranging cargo (Terminal)
4. Working first on cargo arriving on time (Terminal, Truck)

**Impact**

**AS-IS**
- inevitable re-work of cargo during the peak times
  - (With no pre-booking) Re-working of cargo begins when trucks check into the terminal without booking.

**TO-BE**
- Rearranging cargo prior to booking means workload can be distributed
  - (With pre-booking) Arranging of cargo according to sequence of orders using non-peak hours

**AS-IS**
- Yard congested due to the concentration of trucks during the peak hours

**TO-BE**
- Introduction of a slot system to distribute extreme peak time
  - (Slot system) Distributing concentration by adjusting booking slots per hour (cap on the number of trucks)

**Distribution peak times**

(Peak time) Check-in/check-out concentrated within weekday daytimes, limiting yard productivity and discharging from vessels
Key Service 03

VBS, Vehicle Booking System

Achievements

System subscribers (truck driver)
- 2021: 746pax
- 2022: 2,919pax

No. of operations via booking system
- 2021: 1,620
- 2022: 4,866

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

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

Forwarder
- Shorter working periods
- More efficient truck allocation

Truck driver
- Shorter truck waiting times
- Higher throughput

Better schedule reliability
Increase productivity in unloading and terminal operation
Higher revenue & profit
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.