I WANT TO SHARE WITH YOU...

- **OVERVIEW OF TIPC AND OUR PORTS**

- **TRENDS AND CHALLENGES OF OUR PORTS**

- **TIPC'S SMART PORT PROGRESS**

- **MUTUALISM OF PORT RELATED PARTIES**

A GLOBAL SHIPPING HUB LEVERAGING OUR EDGE, EMBRACING OUR DUTY

Taiwan

TIPC-PORTS OPERATION

✓ Oceanic container shipping port

✓ Home Port of International Cruise Lines

Taipei

Keelung

Suao ✓ Tourism and recreation port

✓ Energy and industrial development base

Taichung

Hualien

✓ Tourism and recreation port

Penghu

Budai

✓ Tourism and recreation port **Anping**

Kaohsiung

✓ **Intercontinental Transshipment hub**

● **7 International Commercial Ports**

● **2 Domestic Commercial Ports**
(Mandated by MPB)

CHALLENGES IN THE NEW ERA OF GLOBAL MARITIME INDUSTRY

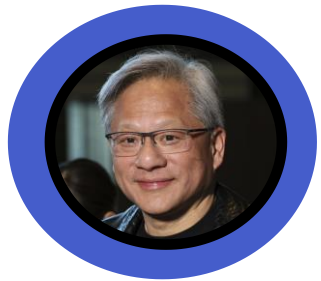| Port Labor Shortage	New Business Diversification	Emerging Technologies	Low Carbon and Decarbonization	Sustainability and Resilience
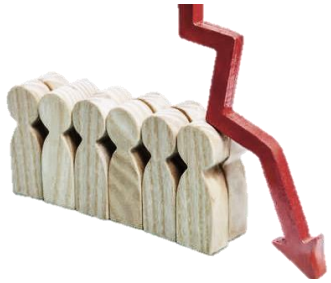
DIGITAL TRANSFORMATION USHERS IN A NEW ERA FOR MARITIME INDUSTRY

"Innovation is not about inventing something new, it's about improving what already exists."

NVIDIA Founder Jensen Huang

Source : National Archives Administration, NDC

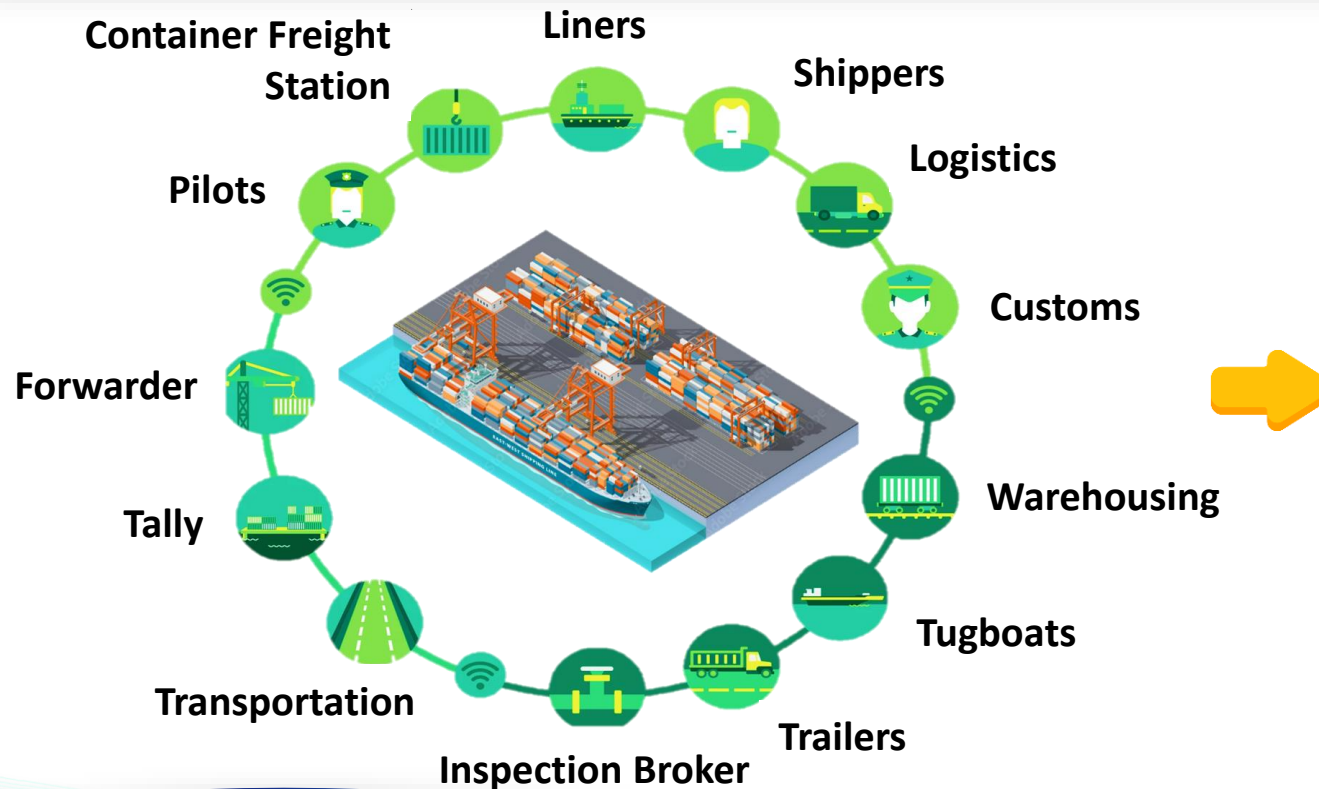# INNOVATIVE VITALITY DRIVEN BY SMART TECHNOLOGY

Port of Kaohsiung in the 1950s

Port of Kaohsiung Today

TIPC SMART PORT VISION

"We aim to build a smart port that prioritizes safety, efficiency, quality, and sustainability."

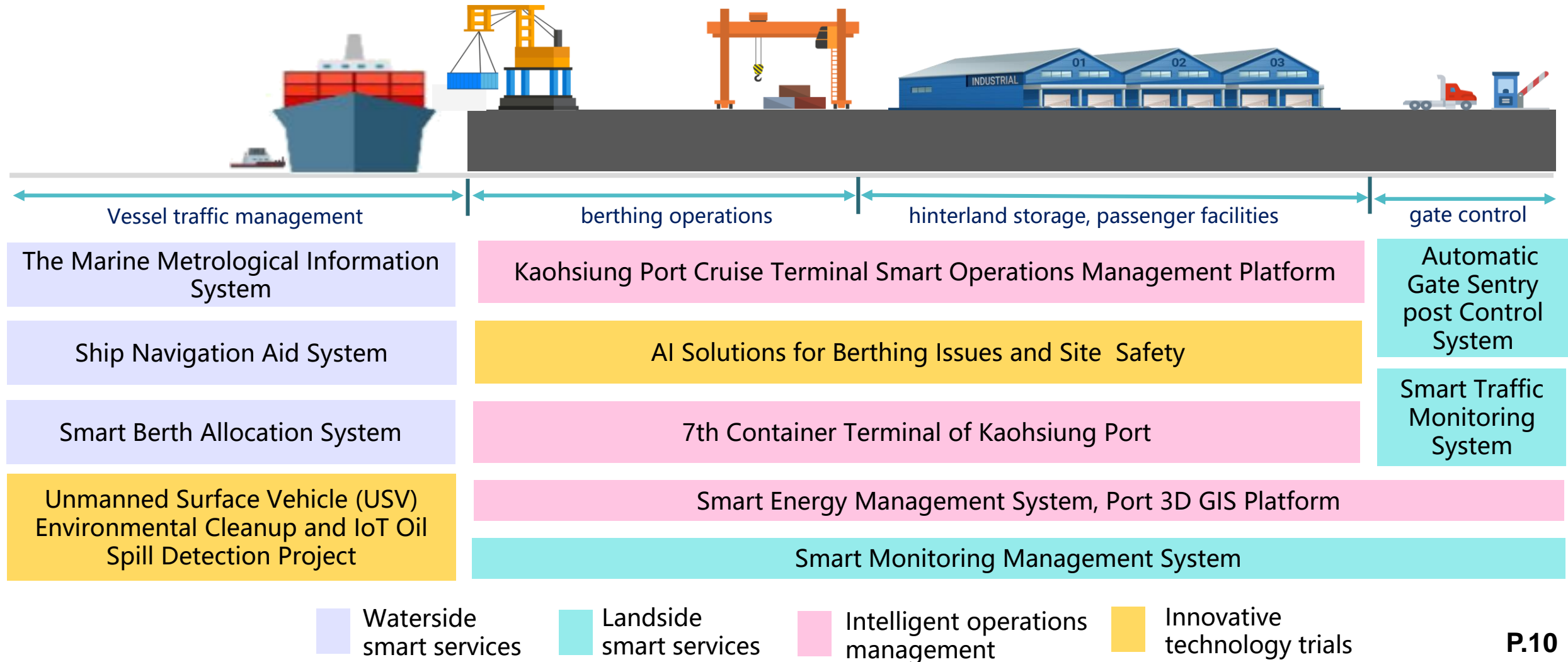

Container Freight Station
Liners
Shippers
Logistics
Pilots
Customs
Forwarder
Warehousing
Tally
Tugboats
Transportation
Trailers
Inspection Broker

WHO are we serving?

WHAT are we satisfying?

HOW can we satisfy their needs?

WHAT WE HAVE INTRODUCED IN PROMOTING SMART PORT DEVELOPMENT

Vessel traffic management	berthing operations	hinterland storage, passenger facilities	gate control

The Marine Metrological Information System	Kaohsiung Port Cruise Terminal Smart Operations Management Platform	Automatic Gate Sentry post Control System
Ship Navigation Aid System	AI Solutions for Berthing Issues and Site Safety	
Smart Berth Allocation System	7th Container Terminal of Kaohsiung Port	Smart Traffic Monitoring System
Unmanned Surface Vehicle (USV) Environmental Cleanup and IoT Oil Spill Detection Project	Smart Energy Management System, Port 3D GIS Platform	
	Smart Monitoring Management System	

Waterside smart services Landside smart services Intelligent operations management Innovative technology trials

THE MARINE METROLOGICAL INFORMATION SYSTEM

24/7 Marine Weather Monitoring, Intelligent Early Warning

- Monitor wind speed, waves, tide levels, ocean currents, visibility, etc. at port area.

- Use push notifications function for early warning to enhance port and vessel navigation safety.

- Provide real-time and accurate information to pilots, ships, agents, and VTS to assist decision-making and operations.

QR-CODE
for the website

SHIP NAVIGATION AID SYSTEM

Consolidate Ship Navigation Dynamics to Enhance Operational Safety

- Integrate ship AIS dynamics and radar data to analyze vessel trajectories.

- Use AI image recognition and algorithm for prediction of ship deviation and timeline of location.

- Provide real-time alarms of potential navigation incidents such as over speeding, collision and anchor dragging.

*Calculate 2022-2023 system statistics

30 Potential Maritime Incidents Prevented since 2022

SMART BERTH ALLOCATION SYSTEM

A One-Stop Smart Berth Status Information Dashboard

- Live display of berth availability and arrival /departure time of vessels.

- One-stop service by combining information of channel traffic control and important port activities.

- Online berth application function for ship agents, cutting annual CO_2 emissions by approximately 30 tons.

QR-CODE
for the website

P.13

AUTOMATIC GATE SENTRY POST CONTROL SYSTEM

Automated Vehicle/Personnel Access Control

- Verify and record vehicle/ individual access in/out port area and Provide quick entry/exit of container trucks.

- Real-time crosscheck with lists of stolen vehicles and fugitives through API connections with database in National Police Agency.

- Over 99% of success rate in AI recognition of vehicle types, helping vehicle diversion.
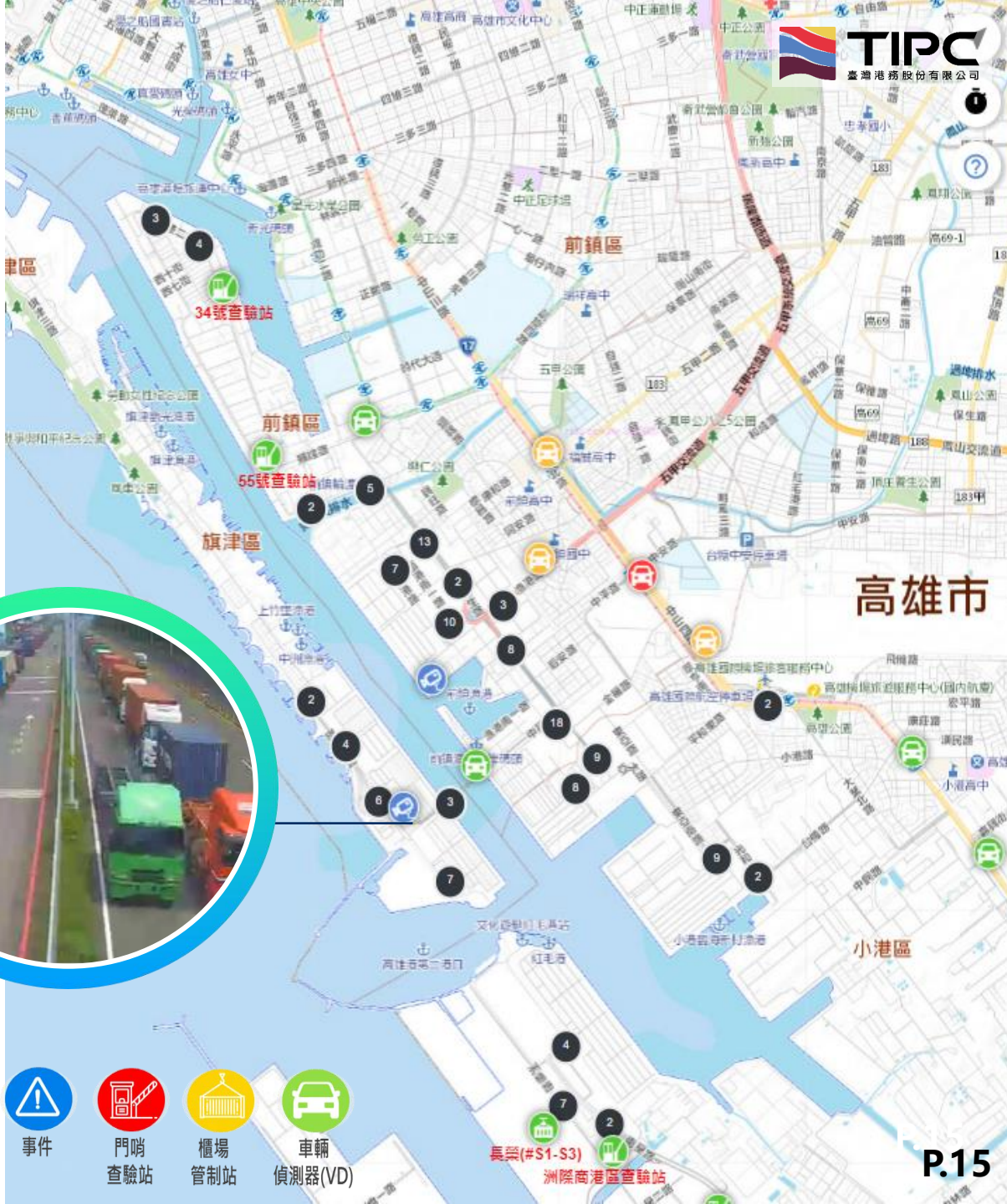
Vehicle clearance time reduced from 4 min to 10 sec

SMART TRAFFIC MONITORING SYSTEM

Real-time Road Traffic Query

- Provide real-time road traffic information in port area and queue status of trucks at container terminals in Kaohsiung Port

- Visualize road traffic information for truck drivers better trip planning, preventing road congestion.

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for the website

CCTV   事件   門哨
              查驗站   櫃場
                        管制站   車輛
                                  偵測器(VD)

Port Operations Control Center

Man fell in

Trespass by vehicle

SMART MONITORING MANAGEMENT SYSTEM

Real-time Intelligent Monitoring and Alerting

- 932 CCTV camera (not included leased terminals and warehouses) images and Information at Kaohsiung Port sent to Port Operations Control Center for monitoring and necessary actions.

- AI image recognition cameras installed at high-risk areas to provide proactive warning to Control Center.

SMART ENERGY MANAGEMENT SYSTEM

Real-time Monitor Energy Efficiency

- Smart sensing equipment of water, electricity, lighting, temperature and monitoring platforms installed at all ports managed by TIPC.

- 24/7 monitoring and management of energy usage.

- Solar power storage system (7,000 KW of generation capacity and 2 MW of energy storage) installed at Kaohsiung Port 7th Container Terminal to achieve peak-shaving goal.

KAOHSIUNG PORT CRUISE TERMINAL SMART OPERATIONS MANAGEMENT PLATFORM

A Silver-label Intelligent Building Awarded by Taiwan's Ministry of Interior

- Customs clearance capacity up to 2,100 passengers per hour for homeport cruises and 3,500 for port-of-call cruises.

- Smart management of foot traffic, lighting, air conditioning, fire safety, and water supply/drainage; anomaly detection and alerts.

- Further integrates energy usage to become a smart sustainable building.

Automated Rail-Mounted Gantry Crane

25 row tandem lifting quay cranes

⚓ Annual Capacity up to 6.5 Million TEU

7th CONTAINER TERMINAL OF KAOHSIUNG PORT

The Most Advanced Container Terminal in Taiwan

- 2,430 meters of quay and 149 hectares of hinterland capable of accommodating 4 24,000-TEU class containerships at a time.

- Unmanned ship-to-shore crane operation at quay and automated cargo-handling operation at yard.

- Fully paperless for cargo pickup and delivery.

- Introduce independent 5G band and apply digital fence management system within the terminal premise.

17 PARTNERSHIPS FOR THE GOALS

INTRODUCE INNOVATION AND ENHANCE PARTNERSHIPS

Port related industries + **TIPC** + **ICT companies / Local governments**

DIGITAL TRANSFORMATION INCENTIVE

Fields and main topics of proposals

Cargo and terminal operations

- Operational automation
- Energy management
- Power supervision
- Facilities for clean trucks
- Smart cargo handing/delivery

ICT applications

- Blockchain
- Cyber security

Transportation and logistics

- Smart Warehousing
- Storage management
- Platform for carbon emission management
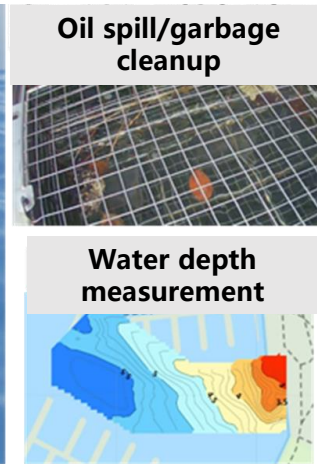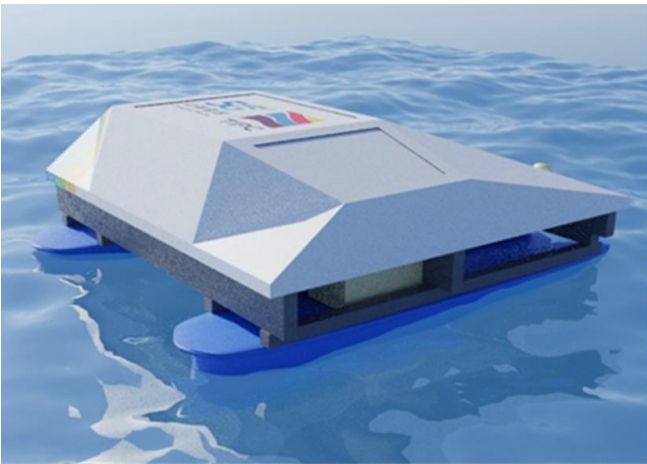
Passenger and yacht/ferry

- Berth management
- Ticketing system
- Energy management

UNMANNED SURFACE VEHICLE (USV) ENVIRONMENTAL CLEANUP AND IOT OIL SPILL DETECTION PROJECT

POS (Proof of Service) project in Kaohsiung and Anping Ports.

✦ Apply 5G communication to unmanned surface vehicles (USV) performing garbage and oil spill cleanup tasks by combining with related equipment to assist water environment management operations in the port area.


Oil spill/garbage cleanup

5G SMART PORT system

Water depth measurement

Water surface image monitoring
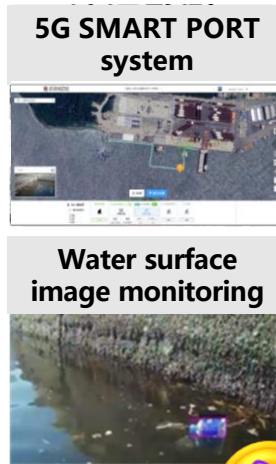
AI SOLUTIONS FOR BERTHING ISSUES AND SITE SAFETY

POC (Proof of Concept) project in Kaohsiung Port.

✦ Automatically detect during vessel berthing/unberthing; with AI to detect and record damage of quayside objects.

✦ Detect on-site workers wearing protective equipment (e.g. Helmet and reflective vests).

Helmet detection

Helmet detection

Panoramic camera

UAV

Bollard

Wheel chock

UAV
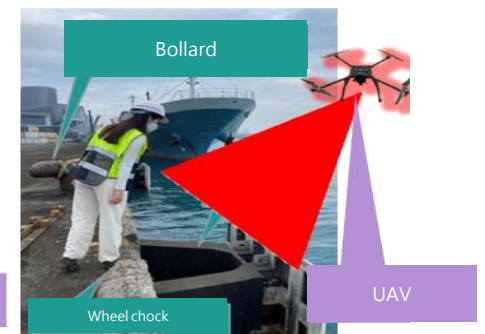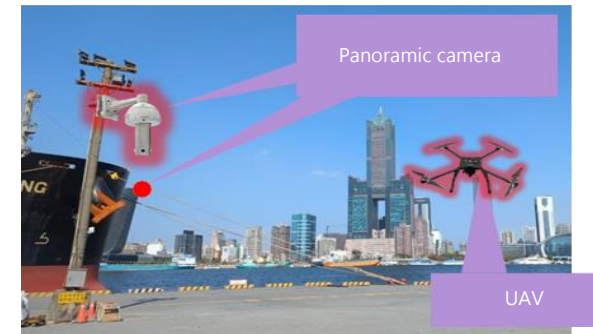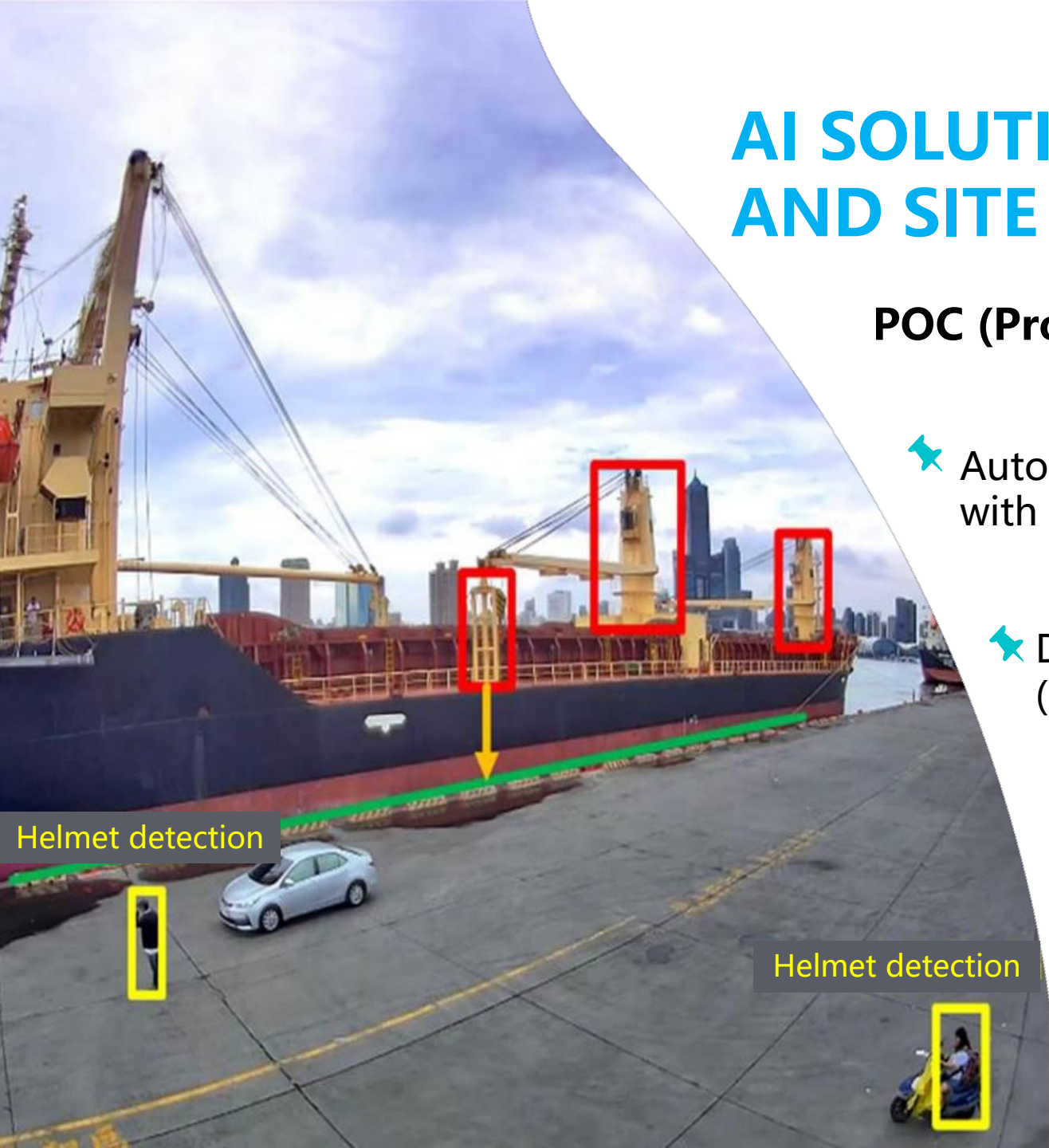
TIPC TWIN TRANSITION

Act NOW for a sustainable future

Sustainable Development

Digital Transformation