

World Ocean Forum 2024

San Pedro Bay Ports Development and Operation in 2024

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San Pedro Bay Ports

PORT OF LONG BEACH

PORT OF LOS ANGELES

WORLD'S 9TH BUSIEST

PORT COMPLEX



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, AeroGRID, and the GIS User Community
Aerial Imagery: USDA (NAIP) July 2018

Recent Changes in the Industry

- 1960s – Containerization



- 1960 – 2005 Bigger and Mega Ships and Terminals



- 2005 – 2015 Green Port



- 2015 – 2024 Automation/Smart Port and AI Design and Operation



Automation

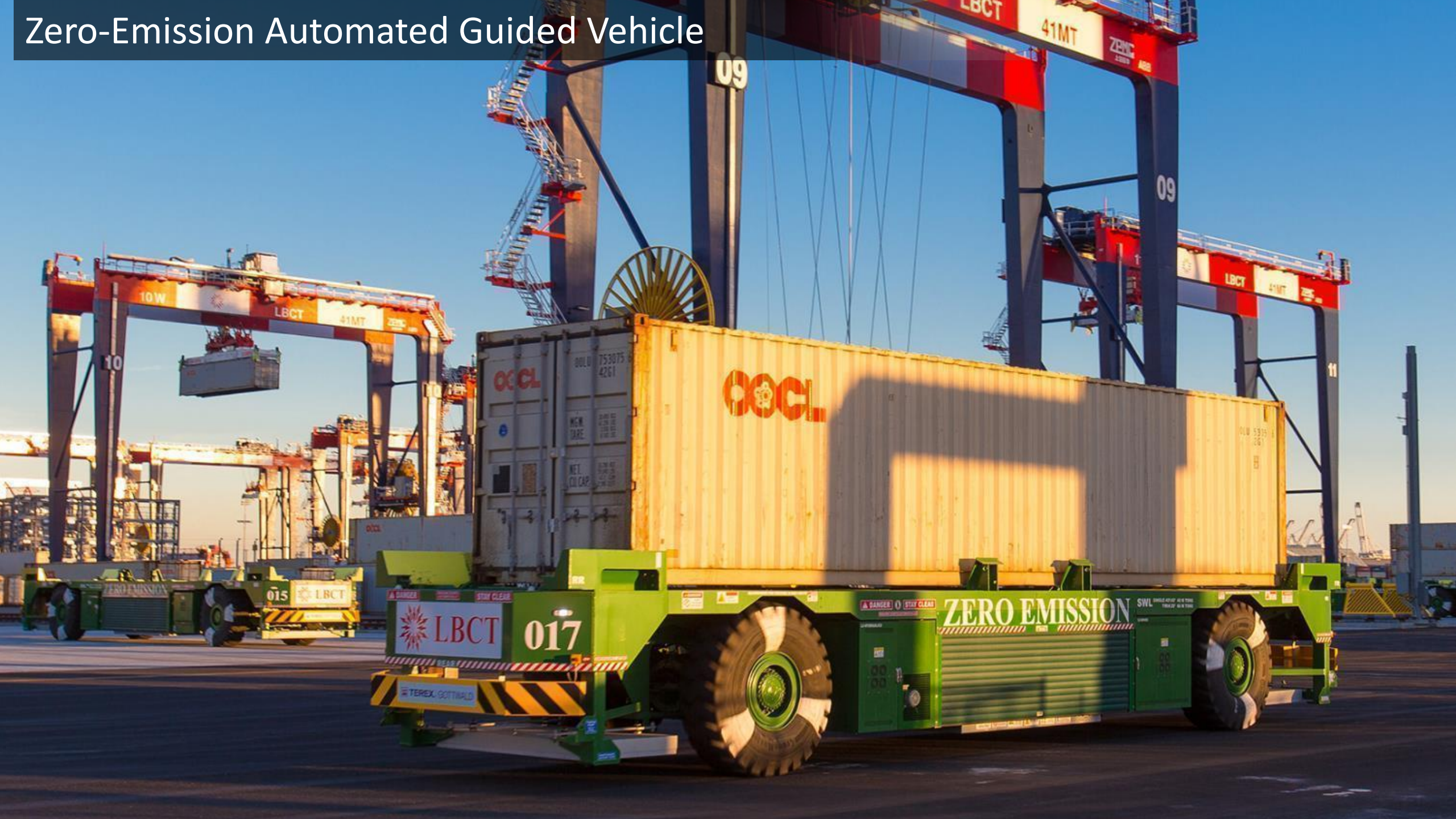
Port of Long Beach's 1st Automated Terminal Long Beach Container Terminal



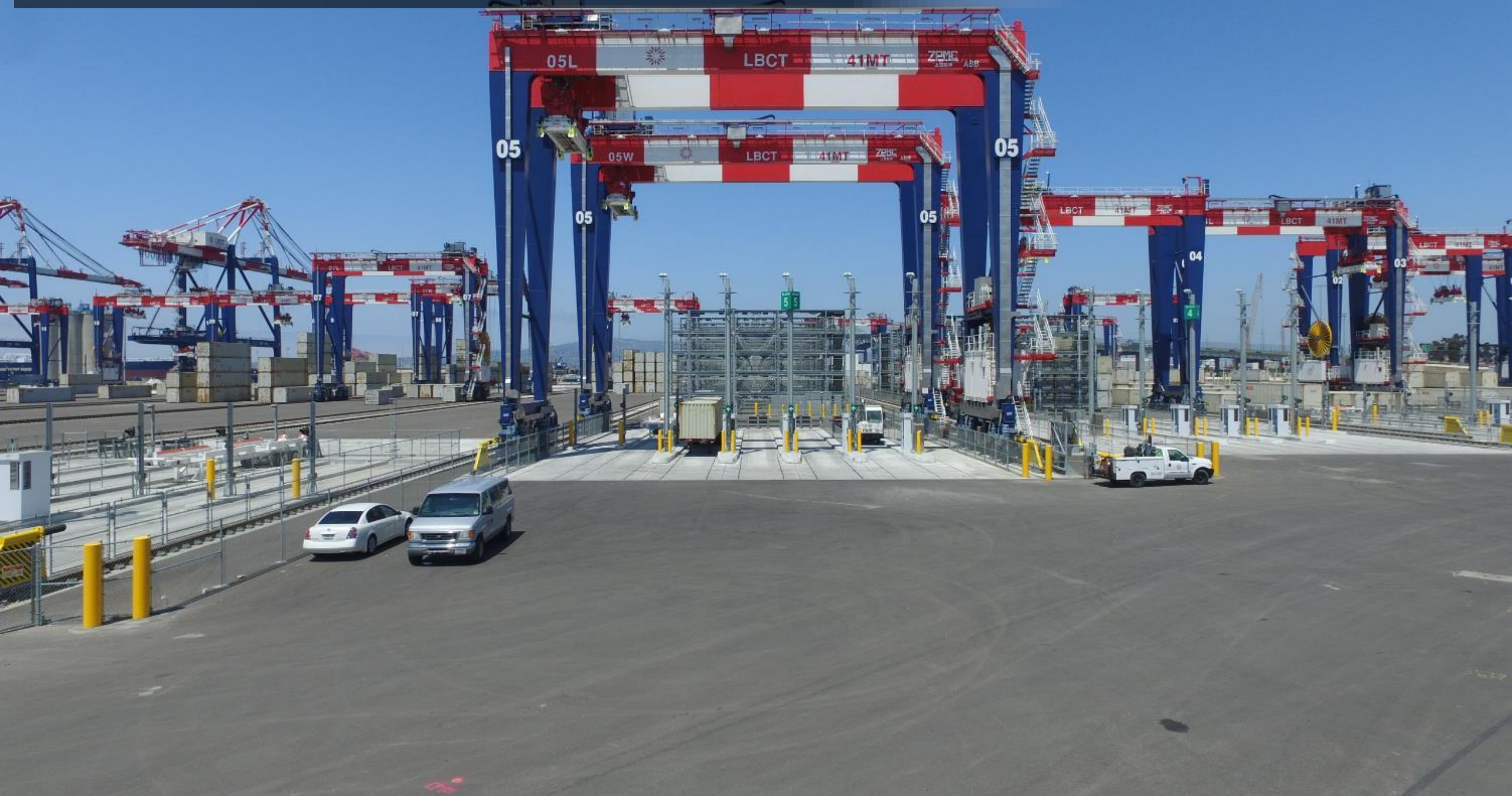
Semi-Automated Dual Trolleys Tandem Lift Shore to Ship (STS) Crane



Zero-Emission Automated Guided Vehicle

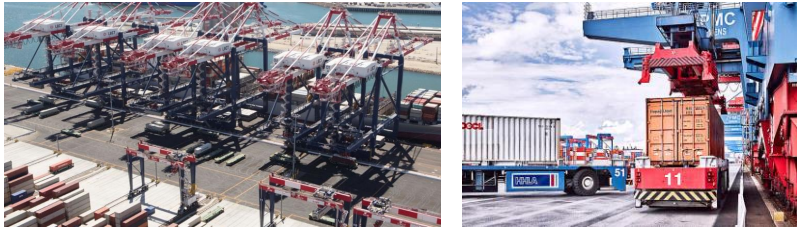


Electrified Rail Mounted Automated Stacking Crane (ASC)



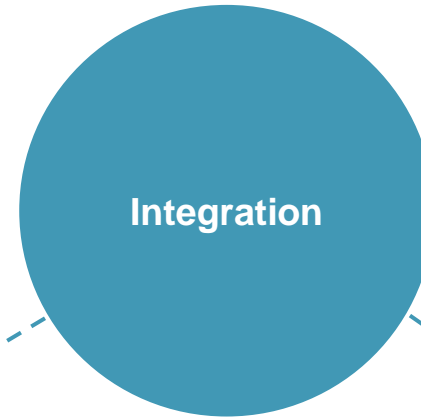
Integration

FULL AUTOMATION



Automation in ...

- › Waterside/Quayside Operations
- › Horizontal Transport
- › Yard Handling
- › Truck Interchange
- › Intermodal Operations



Operating System



Safety Systems



Autogate-Truck



Autogate-Train



Other OCR Technology

What is AI?

Artificial Intelligence (AI)

computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems.

Machine Learning (ML)

Algorithms learn from data to make predictions.



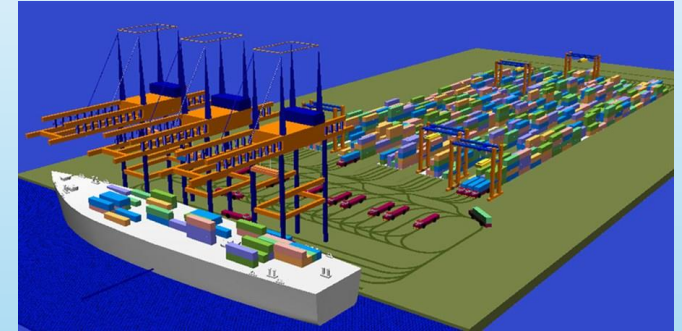
Advantages of AI

- **Efficiency:** Automates repetitive tasks.
- **Accuracy:** Reduces human errors.
- **Data Processing:** Handles vast amounts of data quickly.
- **24/7 Availability:** AI systems don't need breaks.

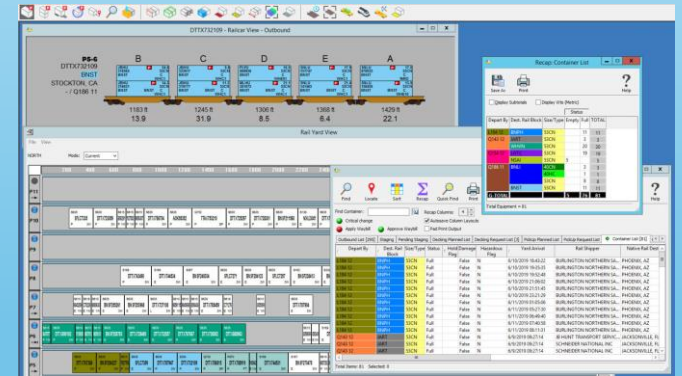


Simulation and Emulation

Simulation : The process of creating model or representation of a system to study or predict its behavior under various conditions.



Emulation : Creating a system that replicates the functionality of another system so that it behaves like the original.



Digital Twin : A digital replica or simulation of a physical object, system or process.

1. Simulation of Terminal Layout
2. Real-Time Monitoring – Operation Efficiency
3. Fault Detection and Preventive Maintenance
4. Strategic Planning
5. Training
6. Enterprise integration

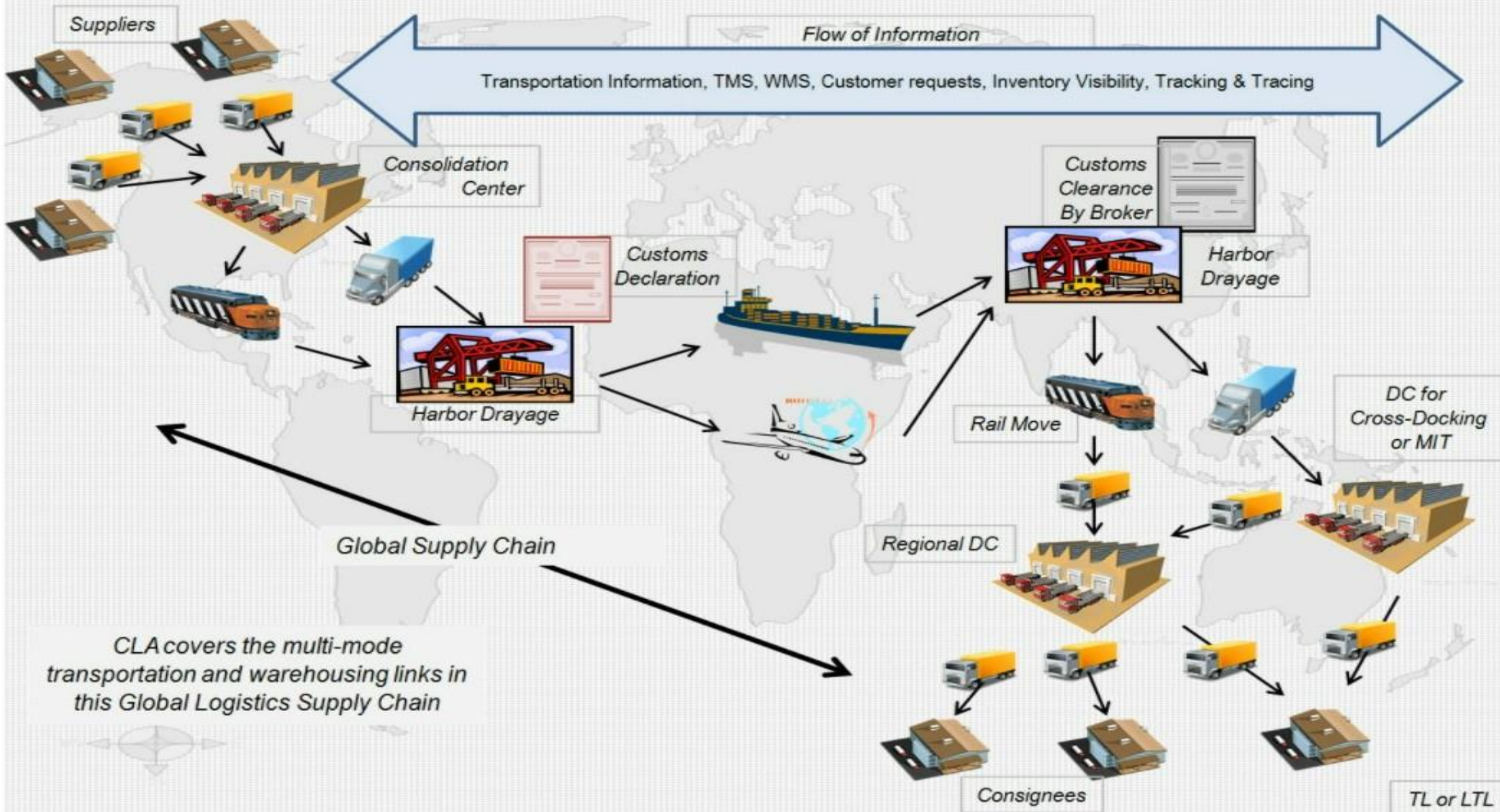


Challenges and Risks of Automation and AI

1. Labor
2. Data Security
3. Collaboration and Cooperation of Stakeholders
4. Regulations
5. Ethics
6. Data Management : Garbage in, garbage out
7. Energy Consumption and management



International Supply Chain



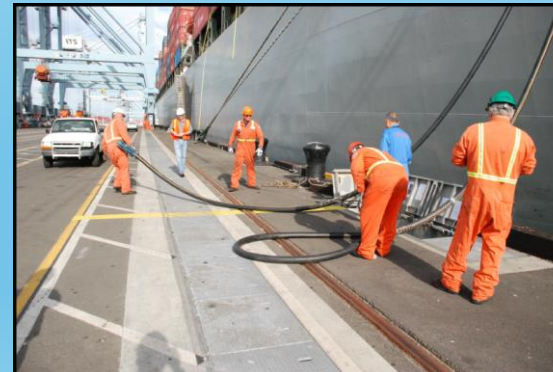
Opportunities and Future

1. Labor
2. Improving the efficiency and optimization
3. Collaboration and Cooperation of Humans and AI
4. Ethics – Responsible development



Sustainability and Renewable Energy

- Zero Emission – Terminal Equipment
- Heavily dependent upon the power suppliers
- Automation, AI, & Energy
- Alternative Energy Source
- Pier Wind at the Port of Long Beach



1,000 - 1,600 UNITS
25 GW
BY 2045



FLOATING TURBINE INTEGRATION



ASSEMBLE



LOADOUT ONTO SEMI SUB



Source: Repsol

FLOAT OFF



Source: Principle Power

WTG INTEGRATION

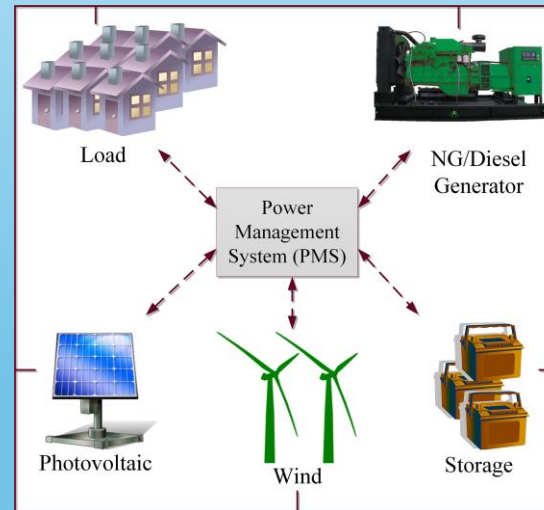
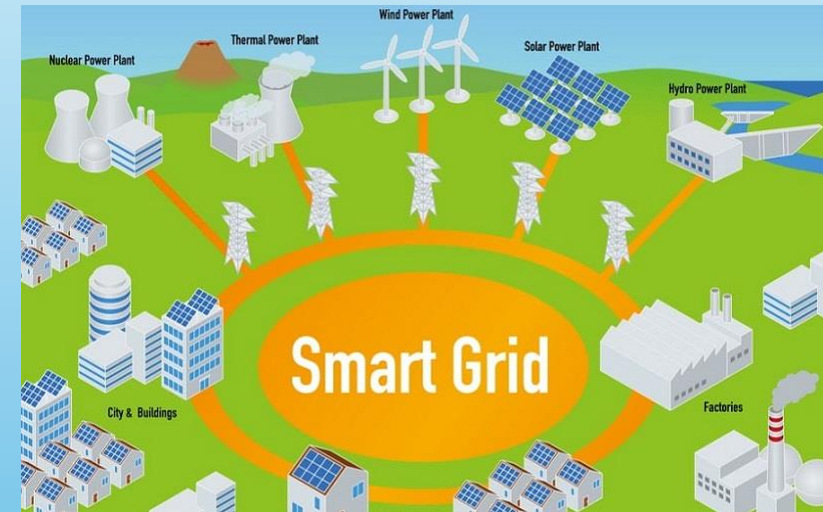


Source: Boskalis

TOW OUT TO INSTALLATION SITE

AI and Energy

1. Requires energy to operate
2. Tool to optimize and integrate the entire energy system
3. Need each other to be sustainable



Final Thoughts

- Automation and AI has unlimited potential
- Alternative energy source will play the critical role
- Requires careful consideration and regulations
- Balance and harmony on Human Side, AI, Automation, and Sustainability
- Tomorrow's leaders





Thank You!

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