

# Leveraging digitalization and AI/ML for smarter terminal operations with next-gen optimization

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**Hong Kong, Kaleris**



# Our Industry is Growing



**120 million TEU**

of new terminal capacity added globally

**30%** increase in global container throughput in the last 10 years

**20%** Volume increase at major ports

**24%** increase in containerized imports in the US

## Barriers for expansion

- Land & location constraints
- High infrastructure costs
- Regulatory & environmental approvals
- Political & public opposition
- Logistics & infrastructure gaps
- Market uncertainty & trade volatility

While demand for container capacity is growing, the **barriers to building new terminals** remain high. The industry needs to focus on **efficiency gains, automation, and technology** to handle this growth

# Why Optimization, Why Now

## Meeting Terminal Challenges and Needs



### Infrastructure strain & capacity constraints

Need to handle increasing volumes



### Labor shortages & rising automation needs

Difficulty finding skilled digital and operational labor



### Environmental regulations

Rising compliance and green technology costs



### Supply chain disruptions

Unpredictability due to geopolitical tensions, pandemics, and climate-related events



### Customer expectations & competitiveness

Global terminal operators and shippers demand real-time visibility, reliability, and speed.



# Challenges without proper data & expert support

## Inefficient Resource Allocation

Poor KPI data leads to delays and higher costs

## Poor Customer Satisfaction

Untracked KPIs result in delays and dissatisfied customers

## Delayed Decision-Making

Without critical KPIs, teams struggle to make quick decisions

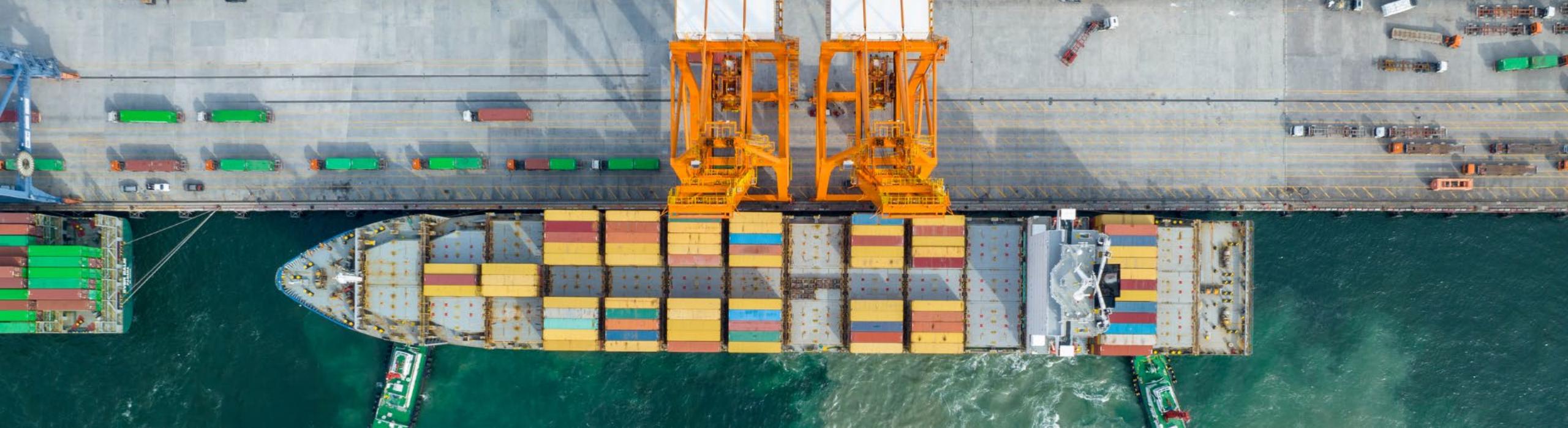
## Reduced Productivity

Lack of key metrics causes inefficiencies and missed SLAs

## Missed Revenue Opportunities

Absence of key data limits revenue potential





## Fewer Greenfield Sites

High costs, land constraints, long ramp-up times.

## More Brownfield Expansions

Innovation must happen in live terminals, increasing risk & complexity.

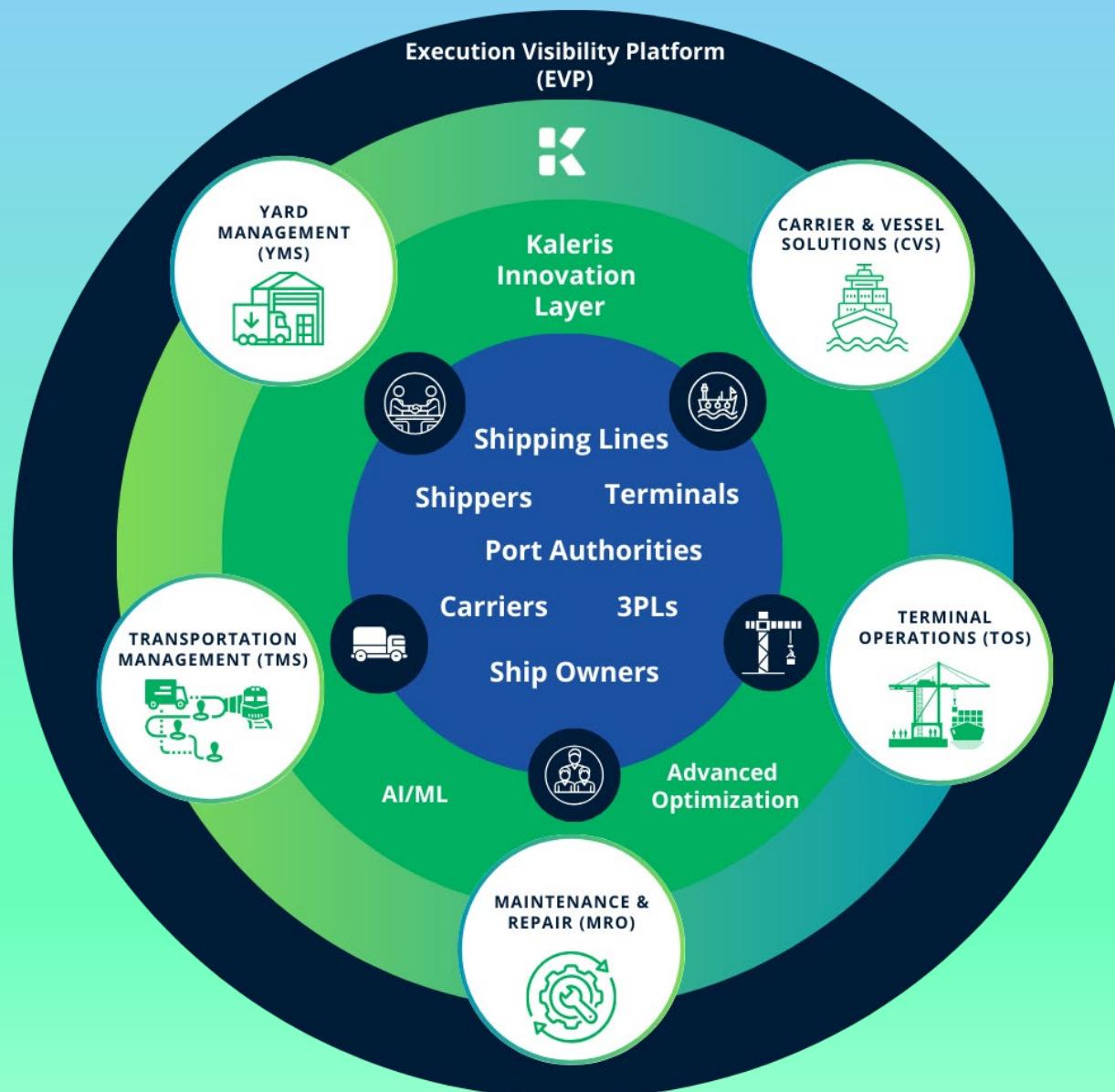
## New Innovation Mindset

No luxury of testing in new sites; must embrace agile, low-disruption solutions.

 **Innovation must adapt-modernize existing operations, take smart risks, and move fast without disruption**



# The Kaleris Execution advantage





## Execution Visibility Platform



### TOS

Terminal Operating Systems

- Container TOS
- Mixed + General Cargo TOS
- Cloud-Based TOS
- Inland Depots



### YMS

Yard Management System

- Enterprise Yard Visibility
- Tasking
- RTLS (Real-Time Location Systems)
- Kiosks, Driver's App



### TMS

Transportation Management System

#### Road

- Route & Dispatch Efficiency
- Fleet & Driver Management



#### Rail

- Rail Visibility
- Rail YMS & Transload
- Financials



### MRO

Maintenance + Repair System

- Intermodal & Railcar Asset Management
- Repair Management
- Billing & Invoicing

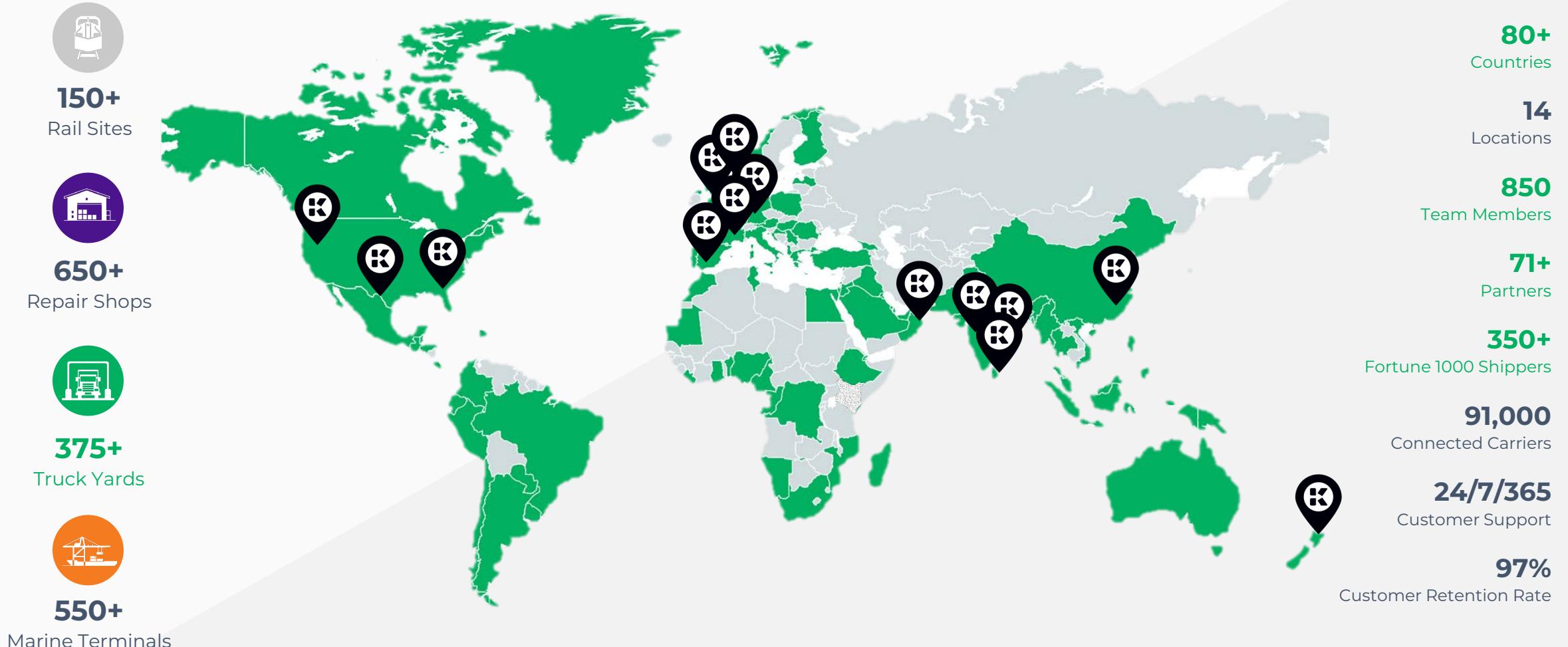


### CVS

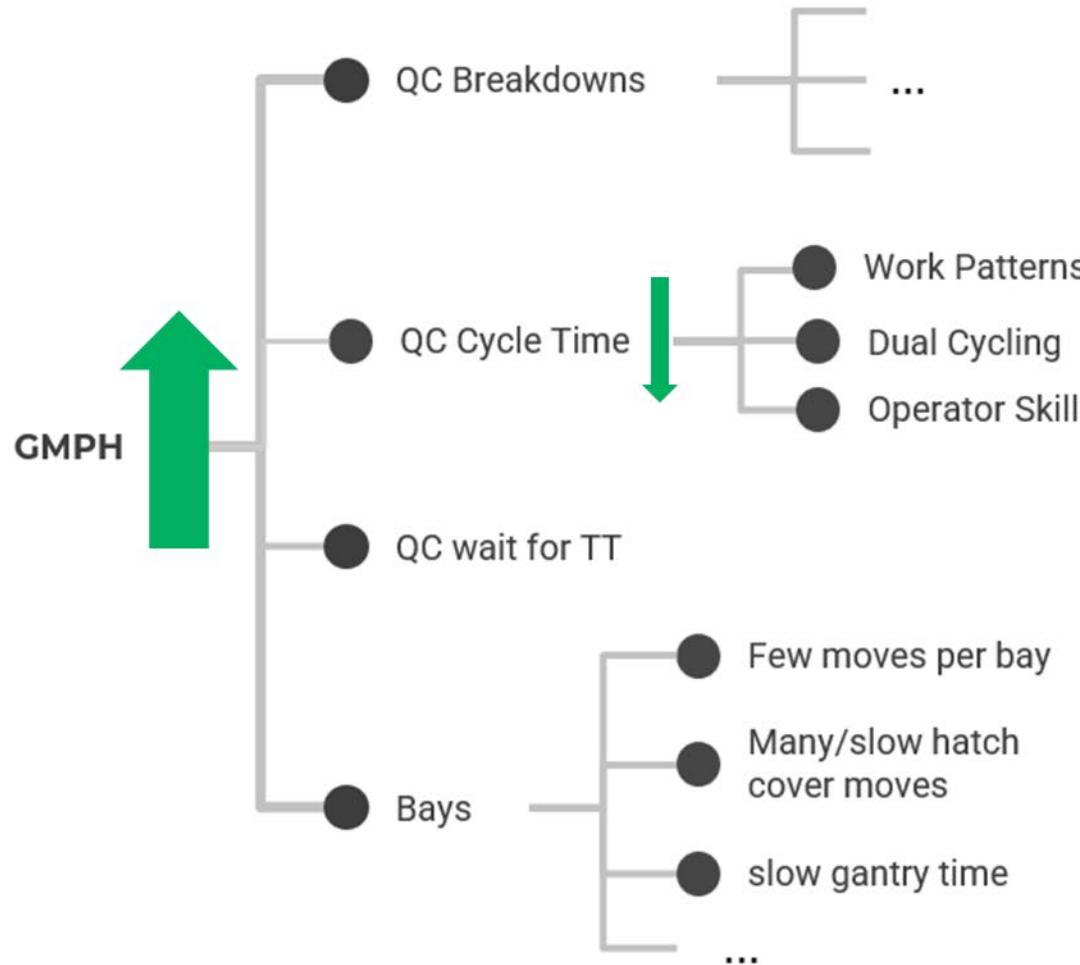
Carrier & Vessel Management System

- Stowage Planning
- Fleet Performance
- Incident Prevention
- Quote-to-cash
- Booking management

# Kaleris Global Presence



# The impact of terminal optimization



- Reefer not unplugged
- WQ not activated on time
- Container not in terminal (late cutoffs)
- Too long distances
- TOS dispatches move late to TT
- TOS dispatches move late to RTG
- No RTG/RS in yard location
- RTG/RS Busy (Congestion)
- Container Damaged
- Rehandling needed
- TT Moves per hours
- RTG / CHE Placement
- RTG moves per hours
- container location can't be accessed
- labor delay (break, shift change, motivational...)



# Achieve Terminal Optimization Faster

*Move more cargo. Reduce delays. Use what you already have*

## Equipment Optimization + Operational Intelligence

(RTGs, Terminal Trucks, etc.)

(KPIs, process improvements, expert guidance)



## FASTER PERFORMANCE GAINS



**Having one helps. Having both accelerates.**



# Terminal Optimization desired outcomes



**Faster truck turnaround**

**Increase:**

- Number of transactions
- Laden travel
- Vessel productivity
- Berth utilization

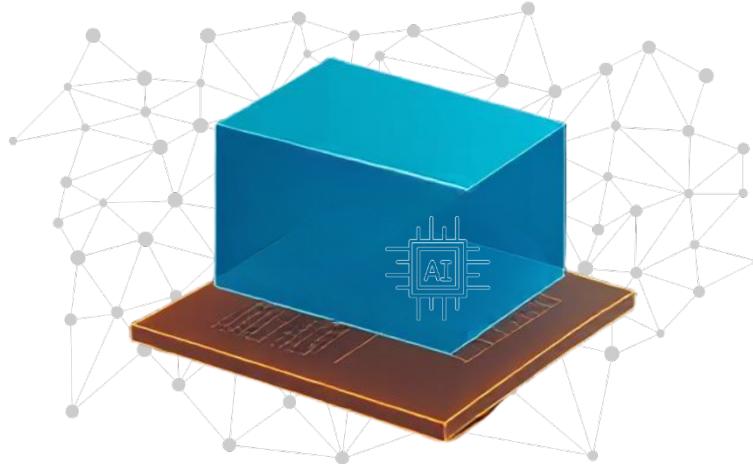
**Reduce:**

- Rehandles
- Yard & QC crane waiting time
- Idle time
- Assignment time
- Unproductive moves
- Truck waiting time
- Unladen travel
- Fuel consumption
- Cycle time

# Path to overcoming the challenges

## STRATEGIES

### Technology as an augmentation layer



**Amplifying People & Resources:** Leveraging technology to enhance workforce efficiency



**Technology as an Enabler:** Using AI-driven solutions to optimize operations

### Stepwise Technology Adoption

*Enhancing existing solutions without disruption*



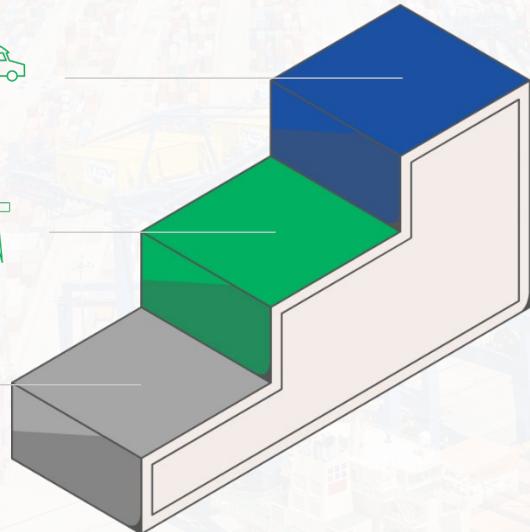
Terminal-wide expansion



Block by block deployment



A subset of fleet



*Deploy in phases, validate impact*



# Kaleris Advanced Optimization

More moves with the same assets, leading to lower cost per move and better ROI.

O

Next-gen vessel planning

Real-time vessel planning  
In roadmap



RTG Automation



RTG Optimization



Full automation

Step-wise transition to automation

Increase RTG productivity



Terminal Truck Optimization



Automated trucks & straddles

Maximize laden travel of terminal trucks

Automate horizontal transport



Yard Intelligence Suite YIS

Reduce unproductive container moves using smart decking solutions

\* Beta Available in Q4 2025

Maximize productivity

- ASC/AGV/ASH scheduling
- Automated QC operations
- Housekeeping

# Customer Success Stories

An aerial photograph of a bustling port. In the foreground, a large cargo ship is docked at a terminal, with numerous shipping containers stacked high on its deck. A yellow gantry crane is positioned next to the ship, ready for loading or unloading. The port area is a complex network of grey asphalt roads and parking lots, with several other smaller ships and boats visible in the turquoise blue water. The overall scene conveys a sense of industrial activity and global trade.



# PTP , First Terminal to Deploy RTG-O and TTO



With **RTG-O and TT-O working in tandem**, we can precisely plan our resources and strategically make operational decisions. Having a real-time view of both our landside and waterside CHE with N4 empowers us to minimize downtime and maximize productivity. **The solutions complement each other, amplifying operational gains** across our fleet and yard. We look forward to continuing our work with Kaleris to drive innovation through technology that provides real-world value.

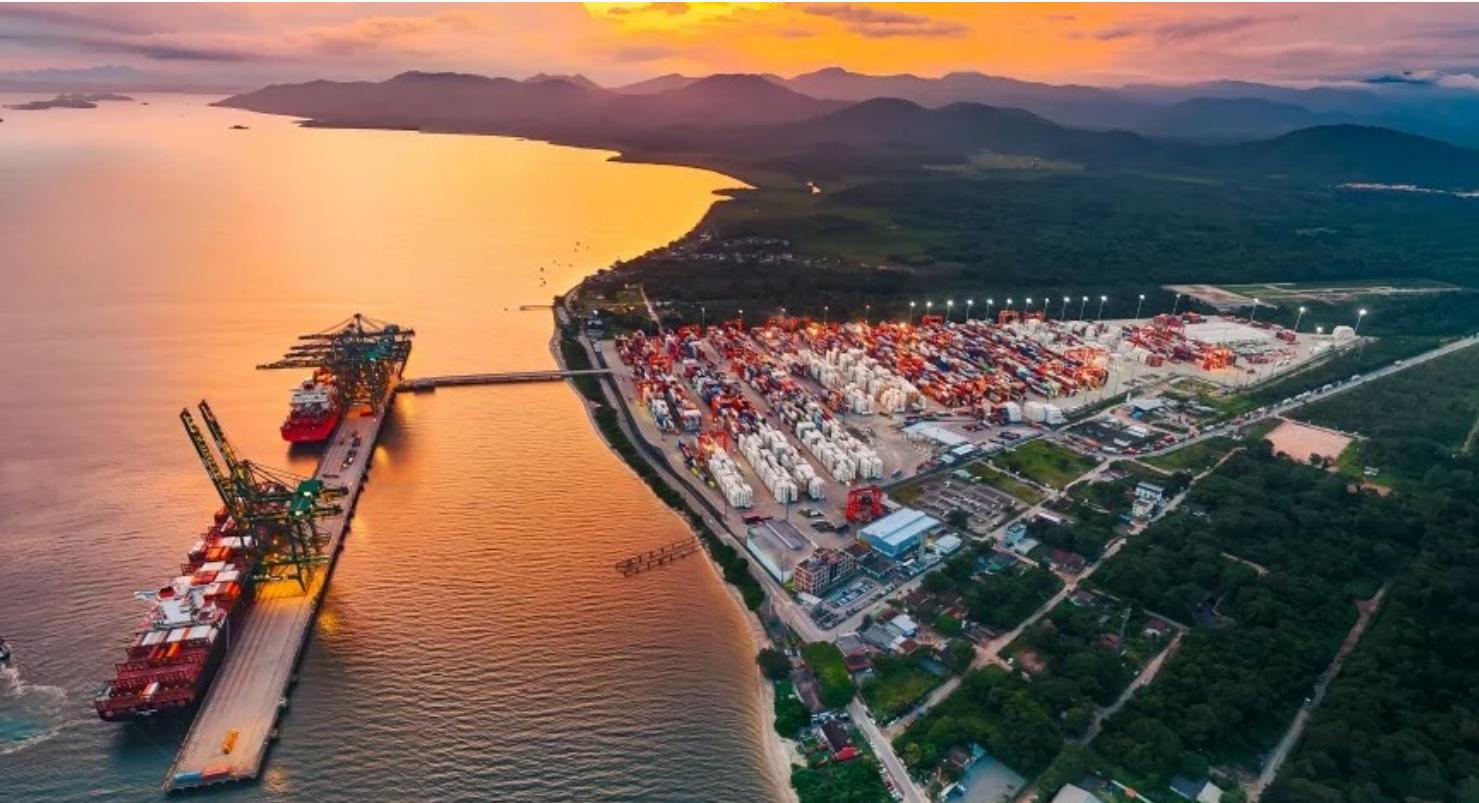
**Joe Schofield, Chief Operations Officer, PTP 2025**

*FIRST CONTAINER TERMINAL IN MALAYSIA TO SURPASS*

**12 MILLION TEUS**



# Porto Itapoá Leads with RTG-O for Next-Level Yard Efficiency



- **Porto Itapoá, Brazil:** One of South America's most modern and efficient container terminals.
- **First RTG-O implementation in region:** Phased rollout of Kaleris RTG-Optimization (RTG-O) in 2025-live on all RTG lanes and delivering measurable crane productivity gains.
- **Continuous innovation:** Project structured to maximize knowledge transfer, minimize disruption, and support ongoing process improvement.
- **Next steps:** Expanding to Yard Crane Balancer and Predictive Rehandles modules for even greater yard efficiency.

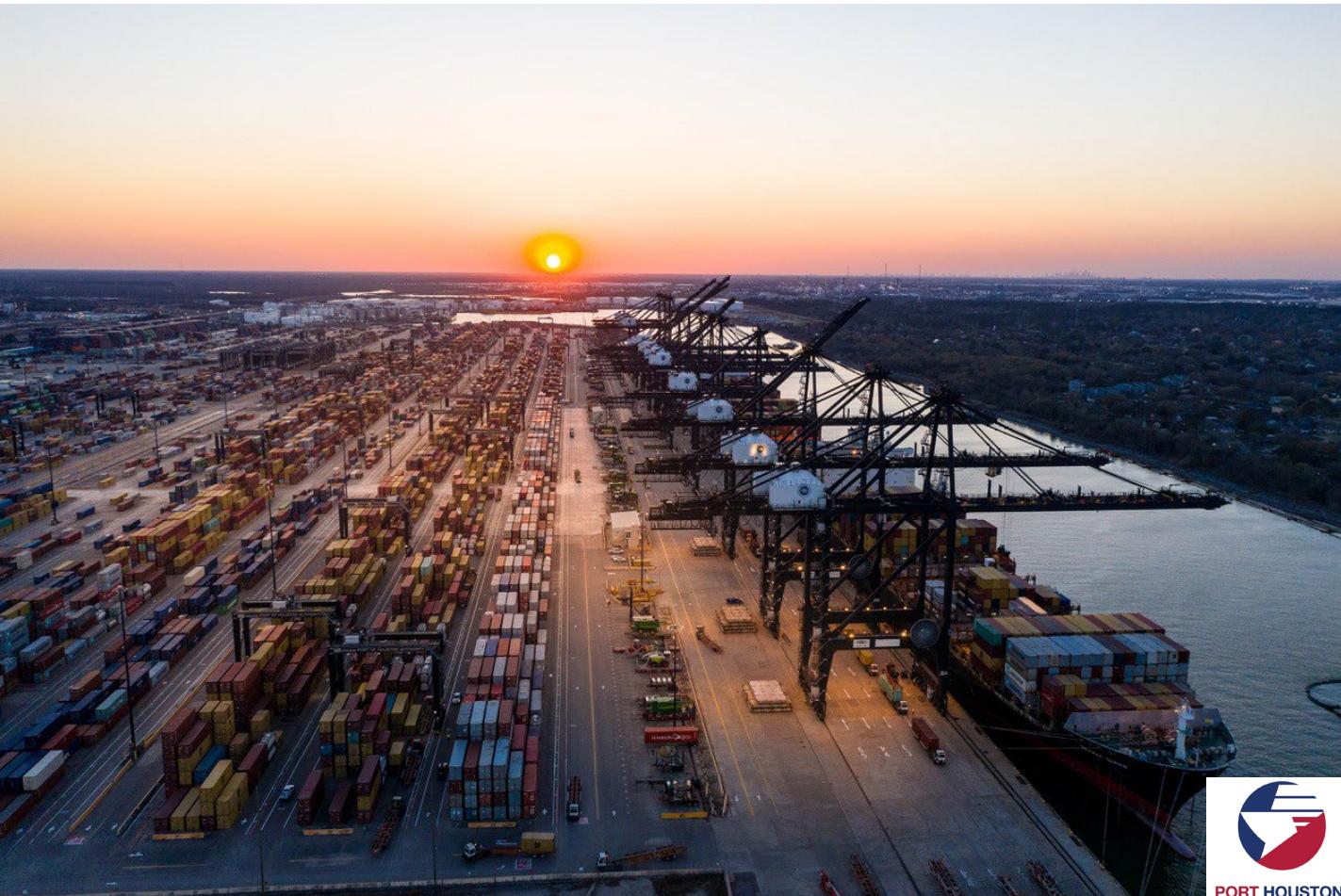
*Implementing RTG-O is a key pillar in our ongoing journey to automate and digitize yard operations*



Sergni Pessoa Rosa Jr., Chief Operations Officer, Porto Itapoá.



# Port of Houston : Operational Transformation with RTG-O



## Key Results

- BCT (Barbours Cut) fleet productivity increased by 12% and BPT (Bayport) by 20%.
- Truck Turn Times improved at both terminals, leading to smoother yard flow.
- Decision-making was consolidated into a central crane operations hub, simplifying front office processes.

## Integrated Decision-Making

- All operational decisions are made through a single, user-friendly interface.
- Teams now have real-time, complete overviews, enabling proactive management of the terminal.
- Detailed insights help identify and respond quickly to operational stress and demand during vessel activity.

## Continuous Improvement Roadmap

- Lane Change Plan now recommends moves based on actual equipment limits, like 4-high RTGs in 5-high blocks.
- SEQ/YCB tracking has been refined, making it easier to analyze RTG assignment decisions.
- Automated recommendations are more transparent, driving ongoing operational excellence.

# Real-world impact

**14,914**

quayside moves in a single 12-hour shift

**1,420**

moves in one hour within that shift

**20%**

reduction in quay crane waiting time

**20%**

increase in laden truck travel

**14%**

improvement in truck productivity

**7%**

reduction in fuel consumption

**11%**

reduction in truck deployment

**13%**

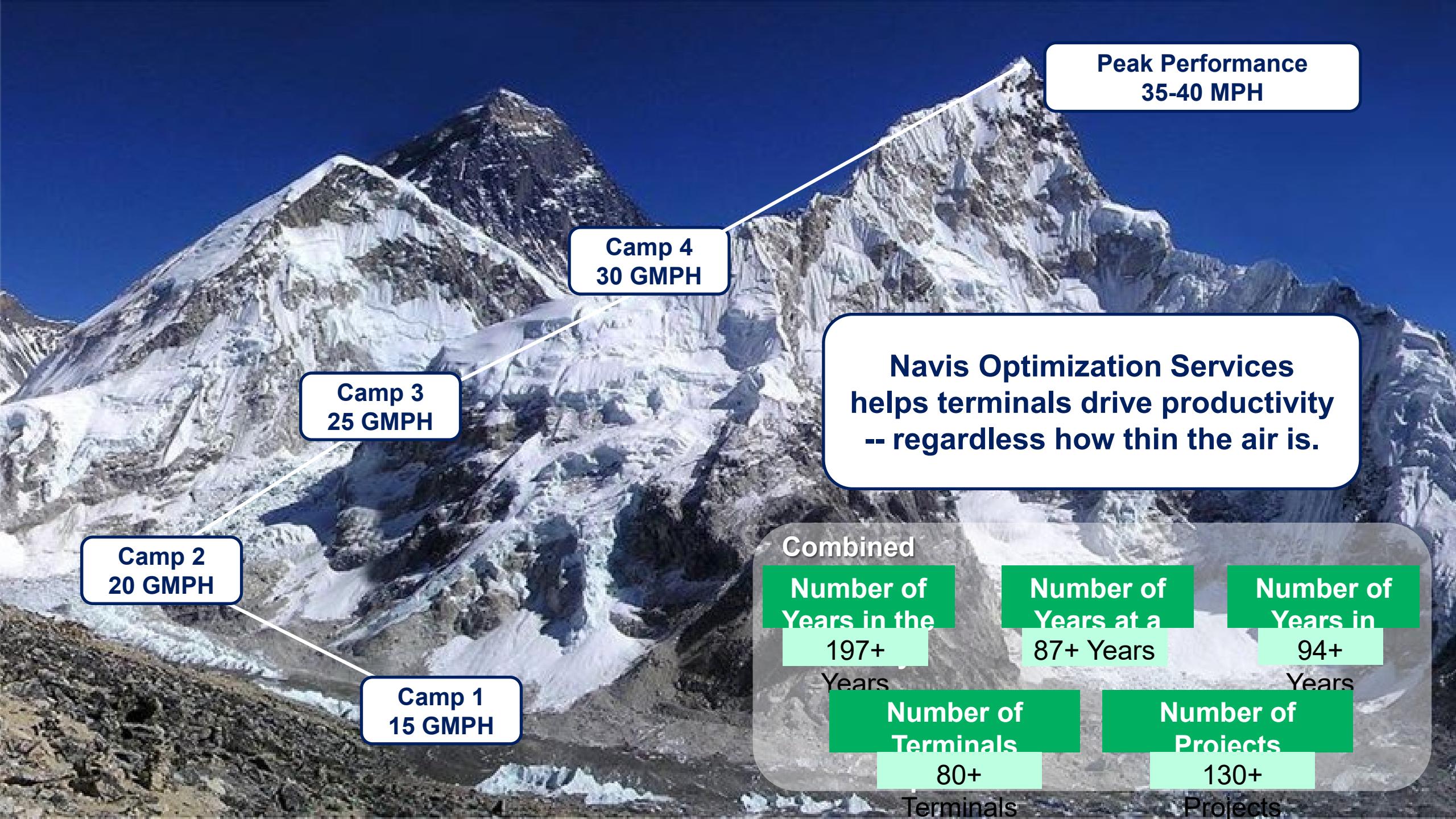
reduction in truck cycle time

**20%**

reduction in unladen driving distance of terminal trucks

**44%**

faster job assignments with optimized truck movement planning across multiple zones



**Peak Performance**  
35-40 MPH

**Camp 4**  
30 MPH

**Camp 3**  
25 MPH

**Camp 2**  
20 MPH

**Camp 1**  
15 MPH

**Navis Optimization Services**  
helps terminals drive productivity  
-- regardless how thin the air is.

**Combined**  
**Number of**  
**Years in the**  
Industry  
197+  
Years

**Number of**  
**Years at a**  
Terminal  
87+ Years

**Number of**  
**Years in a**  
Project  
94+  
Years

**Number of**  
**Terminals**  
80+

**Number of**  
**Projects**  
130+



# Don't Take it From Us.

# Take it from our Customers from around the Globe.

Malta Freeport  10%  QC GMPH	Abu Dhabi Terminals  3.5  2.75 Shuttles / QC, while keeping GMPH at 35.	TCP Paranagua, Brazil  21%  Berth Productivity	Haifa, Israel  -0.5  TTs per operating QC while keeping GMPH
TPSV, Chile  16%  QC GMPH	Marport, Turkey  3.5  4.1 TT Productivity	RIG, Brazil  63%  Berth Productivity	TDT, Italy  -25%  Unproductive moves for load containers
KSSP Thailand: Unladen driving  20% & Rehandles  10% <a href="#">Link</a>			



## ICTSI: Best Supplier Excellence Award

A strong commitment to continuous improvement has been the cornerstone of this successful partnership between ICTSI terminals and Navis-Kaleris.

With real-time visibility into terminal operations, Navis-Kaleris was able to optimize TOS functionality, while ICTSI terminals effectively pinpointed and addressed operational bottlenecks leading to measurable improvements across the board.

The collaboration enabled both parties to proactively identify inefficiencies, streamline processes, and elevate performance.

This partnership is a clear example of how data-driven collaboration fuels operational excellence.

**“** Through our group-wide deployment of the world-class Navis N4 Terminal Operating System, we've had the opportunity to take our partnership with Navis one step further. Together with the Navis Optimization Team, we embarked on a strategic, performance-based collaboration, a true win-win model. Navis is incentivized not for the effort, but for real, measurable improvements in ICTSI terminal operations. Today, we are proud to present this award as a recognition of the dedication, expertise, and partnership that the Navis team, led by Alvin, has consistently demonstrated over the past years. More than just a token of appreciation, this award also stands as a vote of confidence and encouragement for the continued success and innovation we look forward to in the years ahead. – Sebastiano Cerneka (ICTSI Global Head of Operations Technology)





<https://kaleris.com/insights/kerry-siam-seaport-optimizes-operations-and-reduces-carbon-emissions/>

## Kerry Siam Seaport Optimizes Operations and Reduces Carbon Emissions

**(Bangkok, Thailand – June 4, 2024)** – Kerry Siam Seaport Limited (“KSSP”), a multi-purpose deep sea port in Laem Chabang, Thailand, today announced benchmark operational improvements achieved through an optimization program conducted in partnership with Kaleris, a leading provider of supply chain technology solutions including Navis Terminal Operating Systems. The program optimized the Navis N4 Terminal Operating System to reduce truck driving distances by 20 percent and container rehandles by 10 percent, significantly improving productivity and lowering carbon emissions.

KSSP is part of Kerry Logistics Network, a global third-party logistics company headquartered in Hong Kong, with a highly diversified business portfolio and extensive coverage throughout Asia. Kerry Logistics Network offers a broad range of supply chain solutions, including integrated logistics, international freight forwarding for air, ocean, road, rail and multimodal, and e-commerce for industrial project logistics and infrastructure investment.

As KSSP’s annual volume steadily grew and exceeded one million TEU, the terminal proactively launched an optimization program to ensure its operations would scale in the most efficient, sustainable and cost-effective way. KSSP engaged Kaleris Optimization Services, a team of expert consultants specializing in operational best practices that increase productivity and efficiency at marine container ports and terminals. The Kaleris Optimization Services team worked closely with KSSP to identify improvement opportunities in yard strategy, terminal truck operations, and vessel planning. In addition, KSSP implemented advanced planning and optimization software modules in the Navis N4 including, Quay Commander, Berth Window Manager, Expert Decking, Prime Route, and Autostow.

### **KSSP experienced significant value from the optimization program, which includes:**

- Reduced unladen driving distance of terminal trucks by 20 percent, creating an associated fuel savings of 190,000 liters per year.
- Reduced container rehandling by 10% and failure-to-deck events to almost zero.
- Improved quay crane productivity by one point, providing accelerated service for customers.
- Equipped yard planners with tools to manage the yard more strategically.
- Enhanced collaboration with shipping line stowage coordinators, improving vessel and crane workplans.
- Reduced drayage dwell time, creating a better experience for the KSSP trucking community.

“Kaleris Optimization Services generated important ROI for us, making it well worth the investment,” said Sirirat Srerattanamongkon, KSSP’s Director. “Kaleris delivered unmatched operational knowledge alongside a specialized approach that considered the uniqueness of our terminal operations while also sharing industry best practices. The optimization program improved the way work and delivered tangible results.”

“We appreciate the opportunity to partner with KSSP and help them optimize terminal operations,” said Molly Harrison, COO at Kaleris. “By tailoring our knowledge of global operating best practices to align with local requirements, we devised creative solutions to address KSSP’s distinct challenges and improve productivity. KSSP is well positioned to continue delivering the best service to its customers.”

“Our collaboration with KSSP was an ideal example of partnership,” said Alvin Thottukadavil, Sr. Director of Optimization Services. “Together we developed 22 ways to address extremely high yard utilization and managed to deal with above-average driving distances from the yard to the quay.”



# Optimization Offerings

Productivity  
Workshop

Pre & Post Go-Live  
Operational support

Expert Decking

Prime Route /  
TT-O

Autostow

RTG-O

Control Room Setup

Operational Coaching  
(Planning & Execution)

Focus Vessels

Yard Planning /  
Strategist

Vessel Planning as a  
Service

Remote Operations  
Monitoring

Automation Operational  
Support



N4 Advanced  
Module

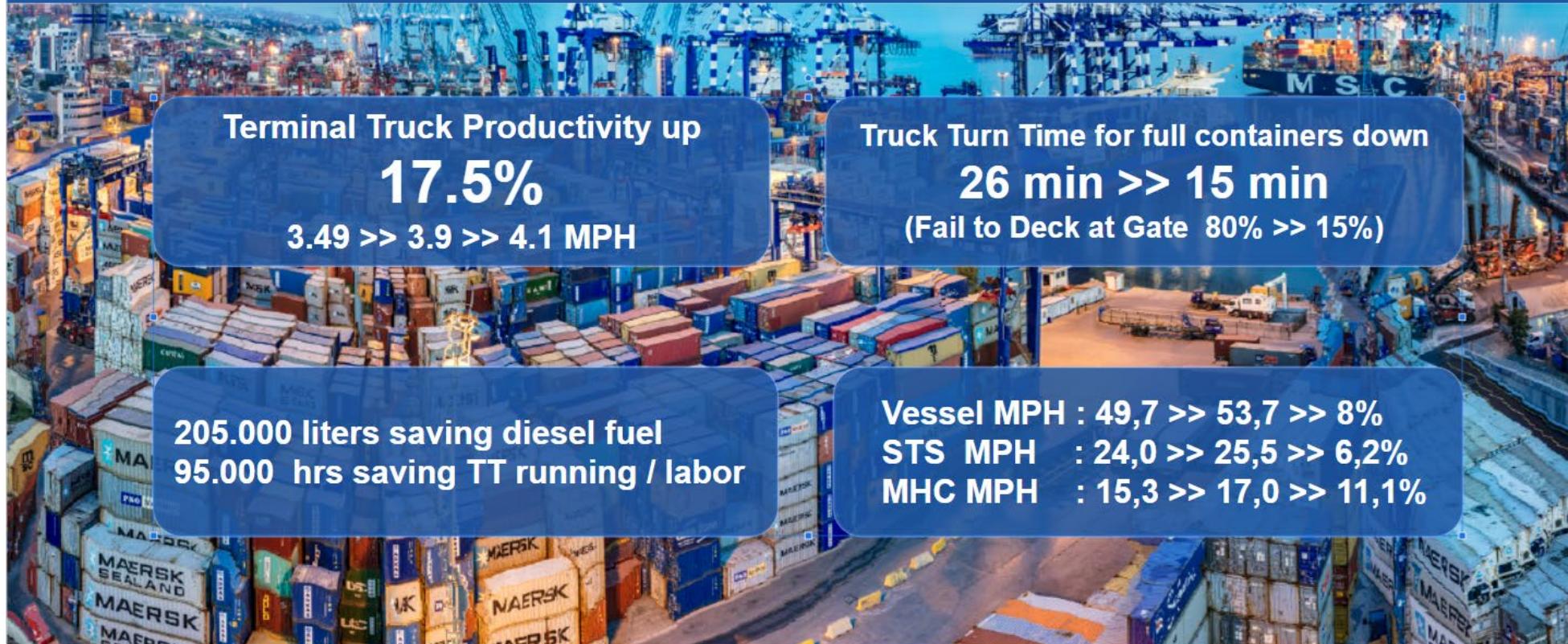
Supported by Low Level KPI measurements

Services



# Marport (Turkey) PRIME ROUTE IMPLEMENTATION

## SUMMARY OF BENEFITS OVER 2 YEARS



Marport, Turkey

3.5 4.1

TT Productivity

2M TEU Marport  
has a mix of  
Import/Export and  
Transship.



## Accomplishments

- One of the key benefits of being an automated terminal is that all our cranes and horizontal vehicles are already electric.
- LBCT made the decision early on to have all electric spreaders
- LBCT has replaced all of our rail grunt vehicles to be fully electric
- During the design of LBCT we added electrical capacity to support electrification of all vehicles
- Recently completed a project with Navis to reduce unproductive moves within the ASC stacks. **The first weekend we observed a reduction of 10,000 unproductive moves**





# KALERIS

## THANK YOU!



Customer Portal: [Community.Kaleris.com](https://Community.Kaleris.com)



[youtube.com/kaleris](https://youtube.com/kaleris)



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