

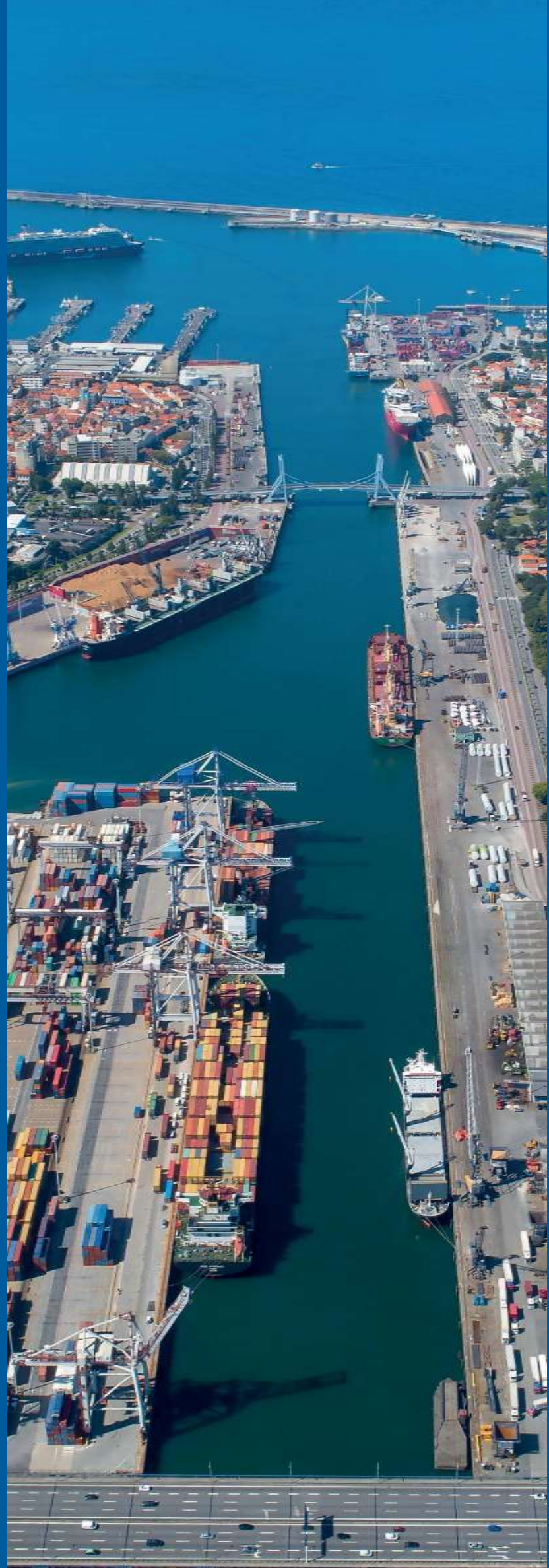
PORT COMPETITIVENESS BEYOND THROUGHPUT

THE DIGITAL INTEGRATION ADVANTAGE



APDL

ADMINISTRAÇÃO DOS PORTOS
DOURO • LEIXÕES • VIANA



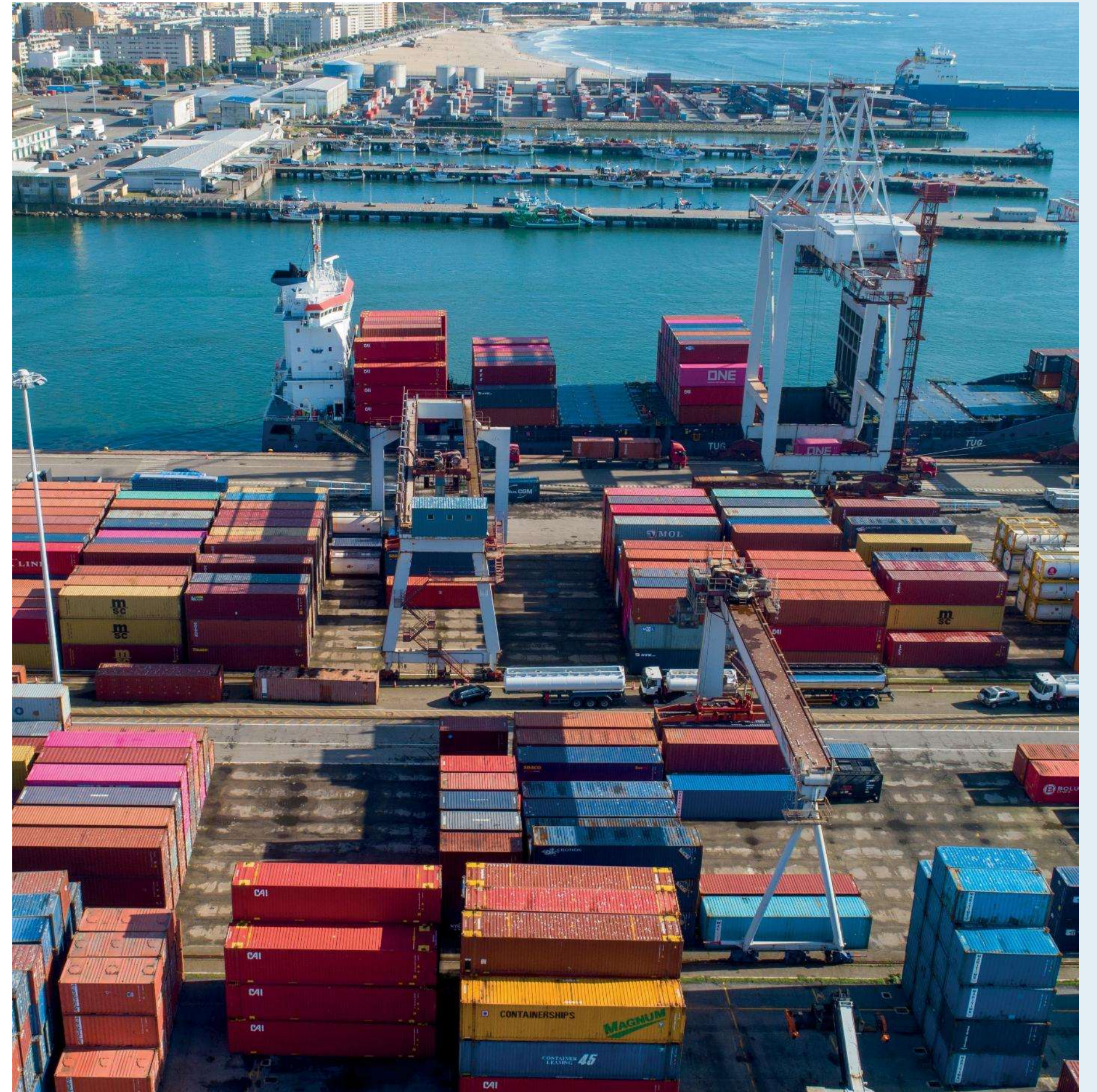
Flow continuity in an age of disruption



PORT OF
LEIXÕES
— APDL —

Throughput made ports relevant. Integration will make them indispensable.

Ports have optimized infrastructure, capacity and operations. But competitiveness is no longer defined by how much cargo moves — it depends on **how well the system performs under stress.**



We Optimized the Wrong Variable

For decades, ports focused on:

Increasing Capacity

Expanding infrastructure and berths to handle more volume

Reducing Turnaround

Minimizing vessel and truck dwell times at terminals

Maximizing Throughput

Moving the highest possible volume of cargo per unit of time

The hidden problem:

Throughput is a lagging indicator

It reflects past performance, not future resilience or adaptability.

Dependent on external stability

Throughput relies entirely on supply chain conditions outside port control.

⚠ When disruption occurs, throughput collapses regardless of local efficiency.

Logistics is Permanently Disrupted



Climate Variability

Extreme weather events disrupt routes, ports, and inland logistics with increasing frequency.



Global Congestion

Bottlenecks cascade across interconnected networks, amplifying local delays into systemic failures.



Energy & Cost Volatility

Unpredictable fuel and operational costs undermine planning and investment decisions.



Geopolitical Fragmentation

Trade tensions and shifting alliances create new barriers and rerouting pressures.



Redefining Port Competitiveness

A **competitive port** is not the one that moves more cargo, but the one that **ensures continuity of flows under disruption**.



1

Visibility

Shared situational awareness across all actors in the logistics chain — knowing what is happening, where, and when.

2

Coordination

Aligned decisions across operators, carriers, terminals, and authorities to prevent fragmented responses.

3

Adaptation

The ability to reconfigure operations dynamically in response to changing conditions and disruptions.



Ports as Orchestration Hubs

Ports are the only nodes where multiple systems converge — creating a unique position to **coordinate flows** across the **entire logistics chain**.



Maritime Transport

Global shipping lines and vessel operators connecting continents



Inland Logistics

Road and rail networks extending port reach deep into hinterlands



Terminals & Operators

Stevedores, logistics providers, and terminal operators on the ground



Authorities & Regulators

Customs, port authorities, and border agencies governing flows

But today, the potential is **unrealized**:

⚠ Data is fragmented across actors and systems

⚠ Decisions remain siloed within each organization

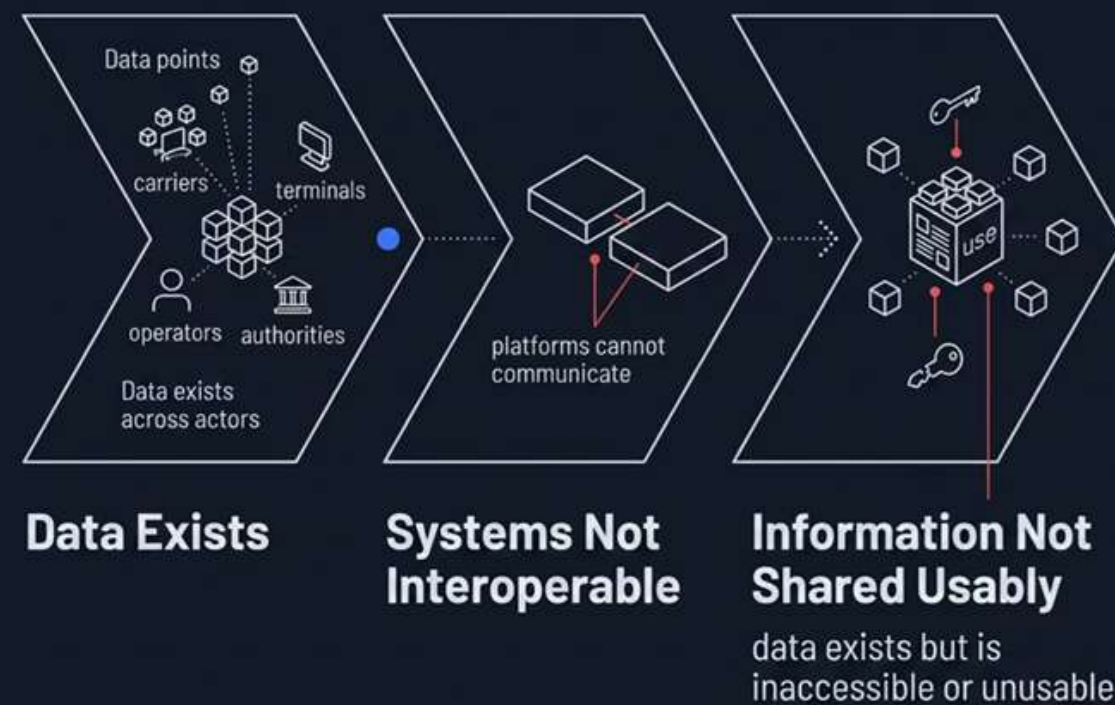
The convergence of systems at ports creates an **unmatched opportunity** — but only if the data and decisions that flow through them are connected.

The Real Gap: Integration

The problem is not lack of data

Every actor in the logistics chain generates data.

The challenge is that this data remains **trapped in isolated systems, invisible** to those who need it most.



- ⊗ The result: limited predictability, reactive decision-making, and systemic inefficiencies across the chain.

The Digital Hinterland

The **hinterland** of a port is no longer only physical. It must be understood as **both physical and digital**.

Extends Beyond Geography

The digital hinterland reaches wherever data flows — far beyond the physical boundaries of roads and rail lines.

Connects All Logistics Actors

Through shared data, every participant — from shipper to final customer — becomes part of a connected system.

Links Port to Inland Flows

Port operations become visible and coordinated with inland transport and last-mile delivery in real time.

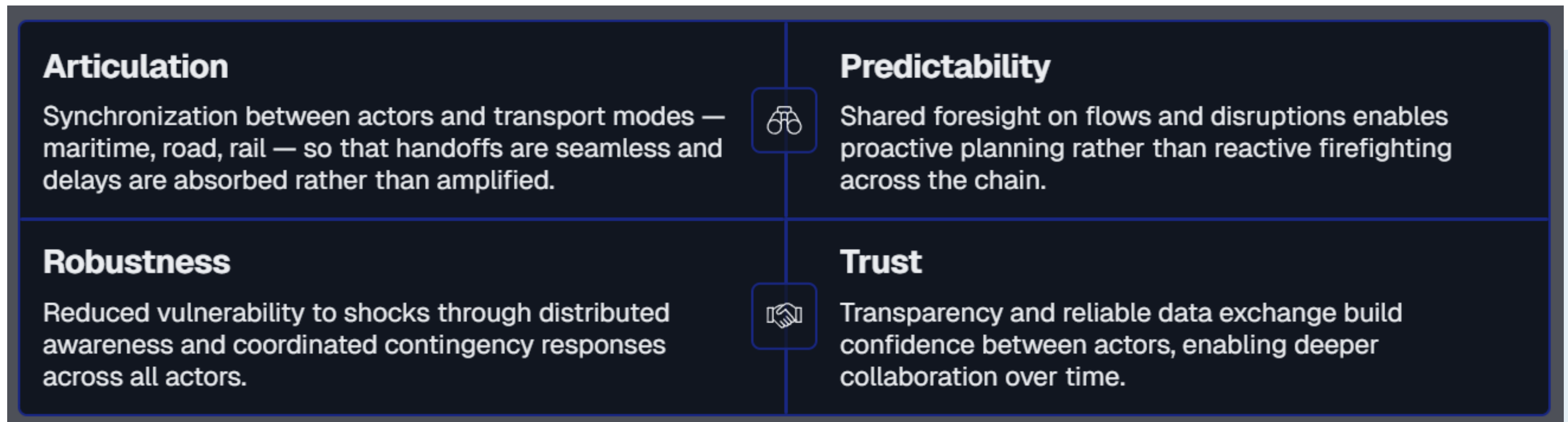
The transformation:

Isolated operations become a **connected system**. Each actor gains visibility into the whole chain — not just their own segment.

The digital hinterland is the infrastructure of the future. Not cables and cranes, but **data flows and shared intelligence**.

From Connection to Coordination

A functioning digital hinterland transforms how the entire logistics system operates moving from fragmented to fully coordinated.



✔ The system moves from fragmented to coordinated — and from reactive to resilient.

The Digital Integration Advantage

Competitive advantage emerges from three capabilities:



Together, these capabilities transform how ports and logistics systems respond to an unpredictable world.

What this enables:

→ **Anticipation of Disruptions**

Early signals from connected data allow actors to prepare before disruptions cascade through the chain.

→ **Dynamic Adjustment**

Operations reconfigure in real time — rerouting, rescheduling, and reallocating resources as conditions evolve.

→ **Faster Recovery**

Continuity of flows is maintained even under stress, reducing the economic impact of disruptions.

i From handling cargo → to orchestrating systems



A Call to Collaborate

The digital hinterland cannot be built by ports alone. It requires a new kind of collaboration — one built on shared purpose and collective value.



Logistics Operators

Connecting inland flows and last-mile delivery into the shared data ecosystem



Carriers & Transport Providers

Sharing vessel and fleet data to enable predictive coordination across modes



Terminals

Opening operational data to enable synchronized handoffs and reduce dwell times

We do not need more data. We need to **connect what already exists**. By sharing data with purpose, aligning decisions, and creating collective value — we build **resilient, predictable and trusted logistics systems**.

A Call to Collaborate

The digital hinterland cannot be built by ports alone. It requires a new kind of collaboration — one built on shared purpose and collective value.



Technology Partners

Building interoperable platforms that connect what already exists rather than replacing it



Authorities

Aligning regulatory data flows to reduce friction and enable trusted information exchange

We do not need more data. We need to **connect what already exists**. By sharing data with purpose, aligning decisions, and creating collective value — we build **resilient, predictable and trusted logistics systems**.

GET IN TOUCH WITH US!

innovation
@apdl.pt



THANK YOU

Filipe Martins
INNOVATION & MODERNIZATION



APDL

ADMINISTRAÇÃO DOS PORTOS
DOURO • LEIXÕES • VIANA