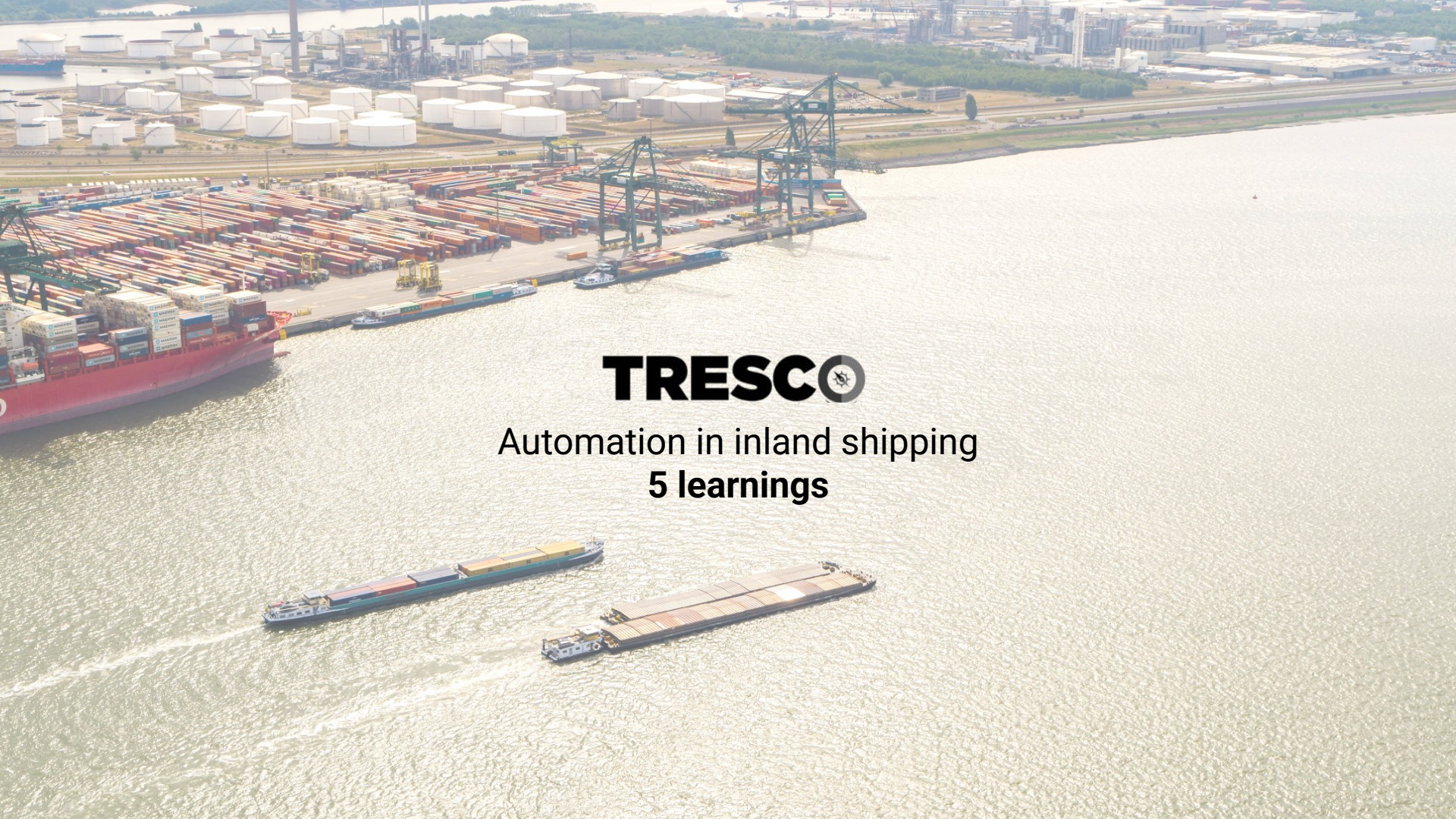


TRESCO

Automation in inland shipping

5 learnings

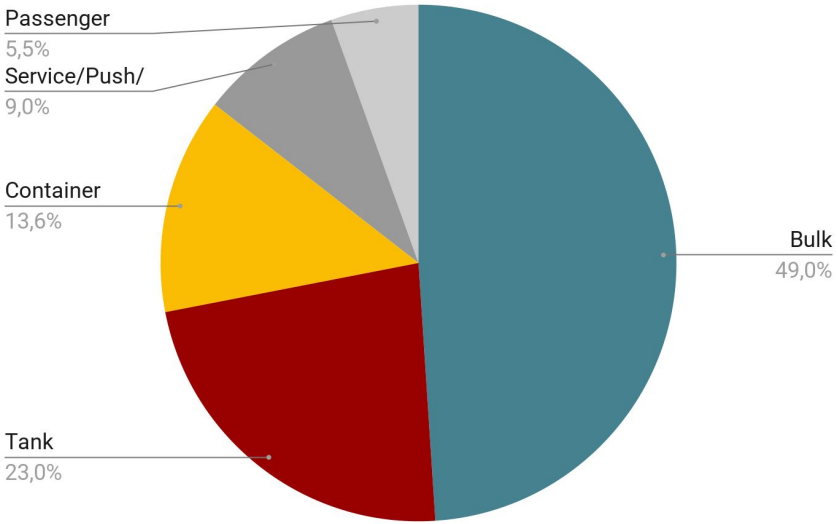
Tresco Engineering: navigation, automation, data

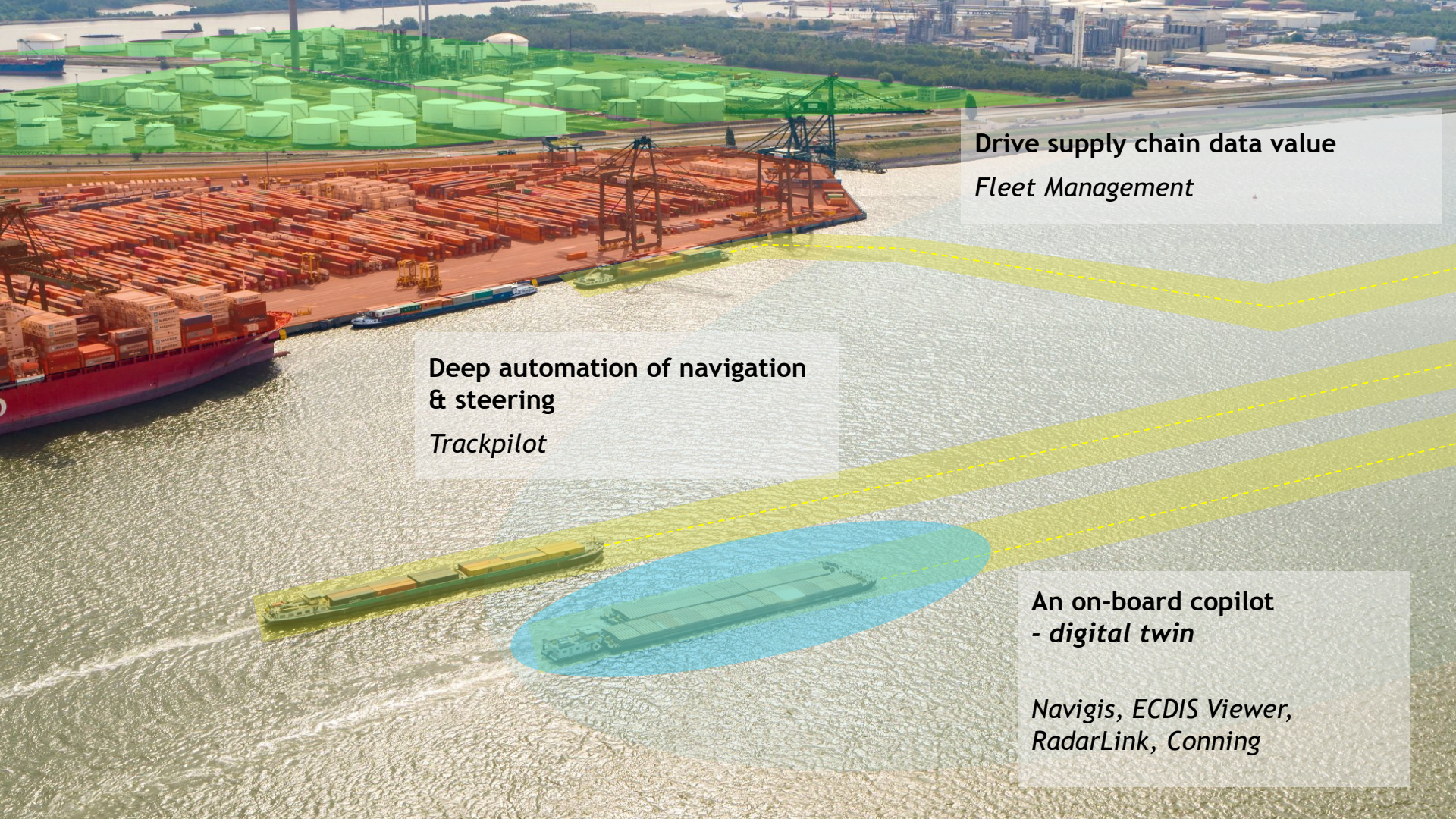
1. °**1998**. European leader in inland navigation technology (HQ Antwerp).

2. **Scale**: platform already supports ~9,000 European inland vessels: cargo, service and passenger

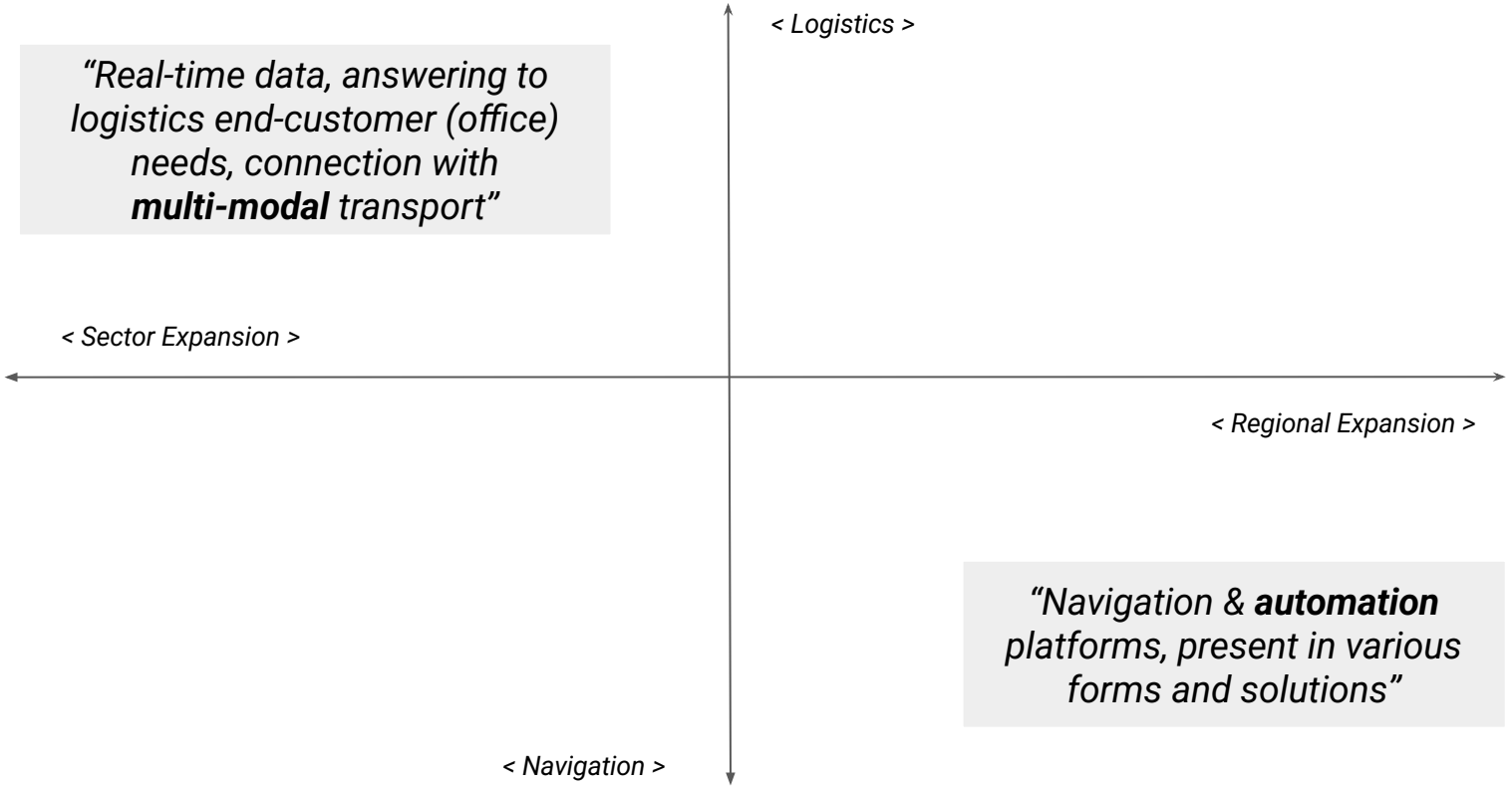
3. **Products**: Charting and automation (e.g. TrackPilot autopilot, Navigis charts) + Fleet Management.

   Trusted by generations of inland skippers.

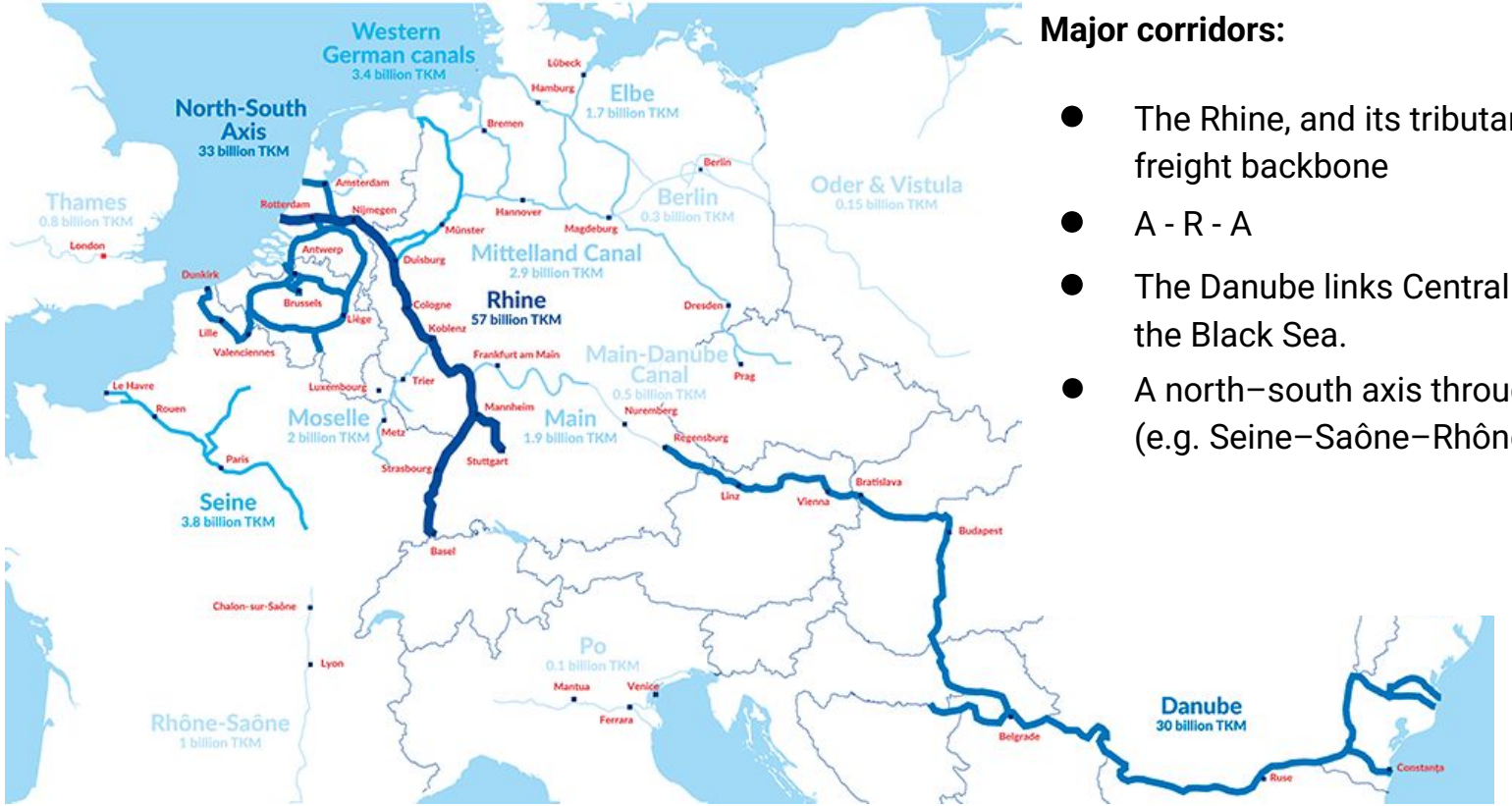



Drive supply chain data value
Fleet Management
Deep automation of navigation & steering
Trackpilot
An on-board copilot
- digital twin
Navigis, ECDIS Viewer, RadarLink, Conning

IWT tech growth vectors



Market context



Major corridors:

- The Rhine, and its tributaries are the freight backbone
- A - R - A
- The Danube links Central Europe to the Black Sea.
- A north–south axis through France (e.g. Seine–Saône–Rhône routes)

Market context

1. **Fleet size:** ~15,300 professional inland vessels in Europe (2023) ccr-zkr.org.
   This includes ~13,500 cargo ships (dry + liquid + push) and ~400 passenger/cruise vessels

2. **Growing ship size:** The largest inland container ships on the Rhine now carry ~576 TEU, close to sea-going feeder sizes (600+ TEU).

Congestion & crew shortage = **levers for automation**

1. **Modal shift:** Moving containers and bulk from road to barge (average 130m ship/barge ≈ 80 trucks) is a key strategy for sustainability and decongestion.

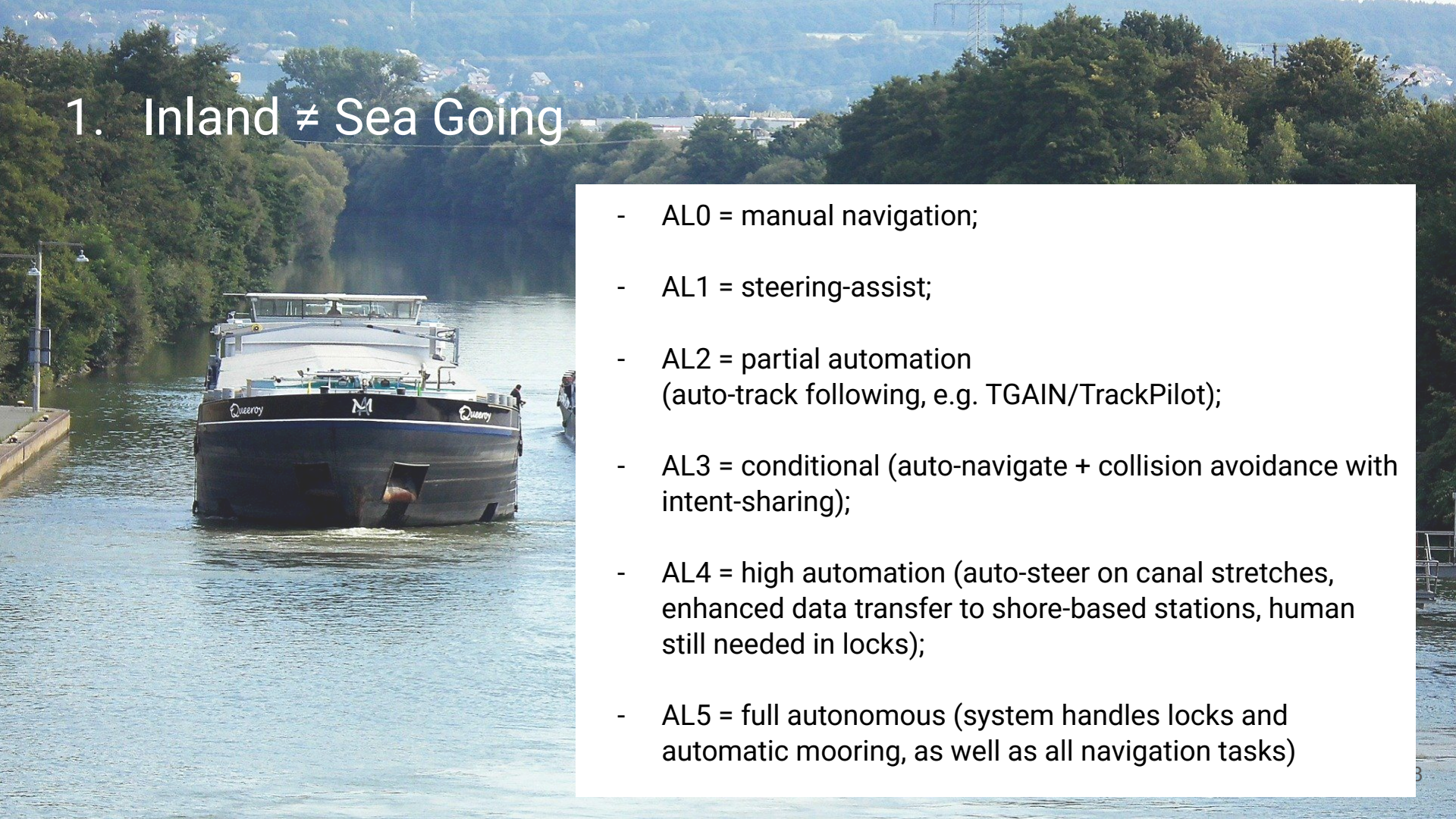
   Road congestion:

   – Trucks dominate EU freight (≈25.3% of tonne-km)
   – Inland waterways carry only ~5% Europe's highways are heavily congested; diverting cargo to rivers is a priority. The EU has set a target of +25% IWT share by 2030 to relieve roads.

2. **Crew shortage:** Only ~42,000 people work in EU inland shipping (2020) and the workforce is aging. Few new skippers are entering.

   This shortage of qualified captains/crew now ***limits fleet growth*** (new ships can't sail if no crew).

1. Inland ≠ Sea Going



- AL0 = manual navigation;
- AL1 = steering-assist;
- AL2 = partial automation
  (auto-track following, e.g. TGAIN/TrackPilot);
- AL3 = conditional (auto-navigate + collision avoidance with intent-sharing);
- AL4 = high automation (auto-steer on canal stretches, enhanced data transfer to shore-based stations, human still needed in locks);
- AL5 = full autonomous (system handles locks and automatic mooring, as well as all navigation tasks)

1. **Automation path**: Trackpilot as gamechanger

Current state (AL2):

An advanced Trackpilot that follows pre-defined, *dynamic* tracks on rivers/canals with minimal steering effort.

These systems take continuous course commands (updates/sec) to keep vessels on the ideal route.

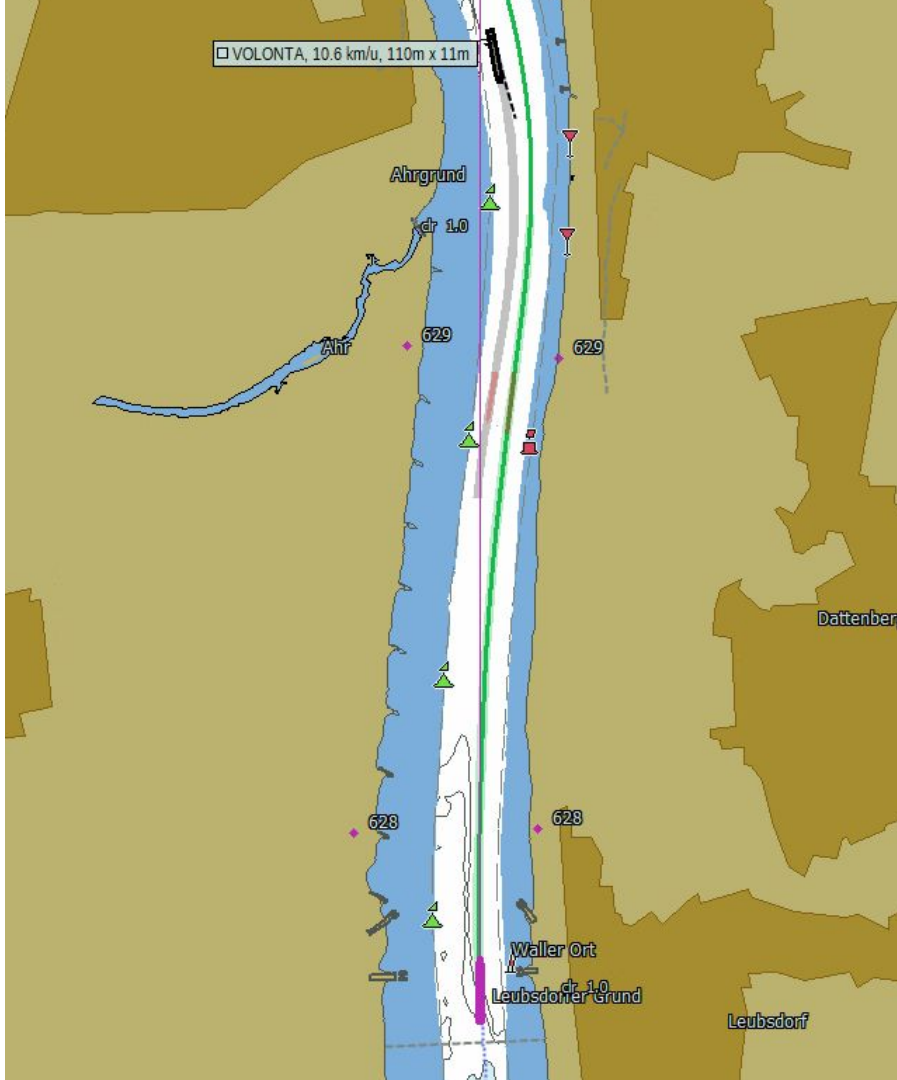
1. Automation path: **intention sharing**

Towards AL3: The current step is sharing intent between vessels.

Digitally broadcasting planned routes or intentions (via AIS/VDES or dedicated systems) can let automated ships *coordinate*

(studies show this boosts safety/efficiency) inlandwaterwaytransport.eu).

In short, AL3 will rely on ships communicating their courses in real time.



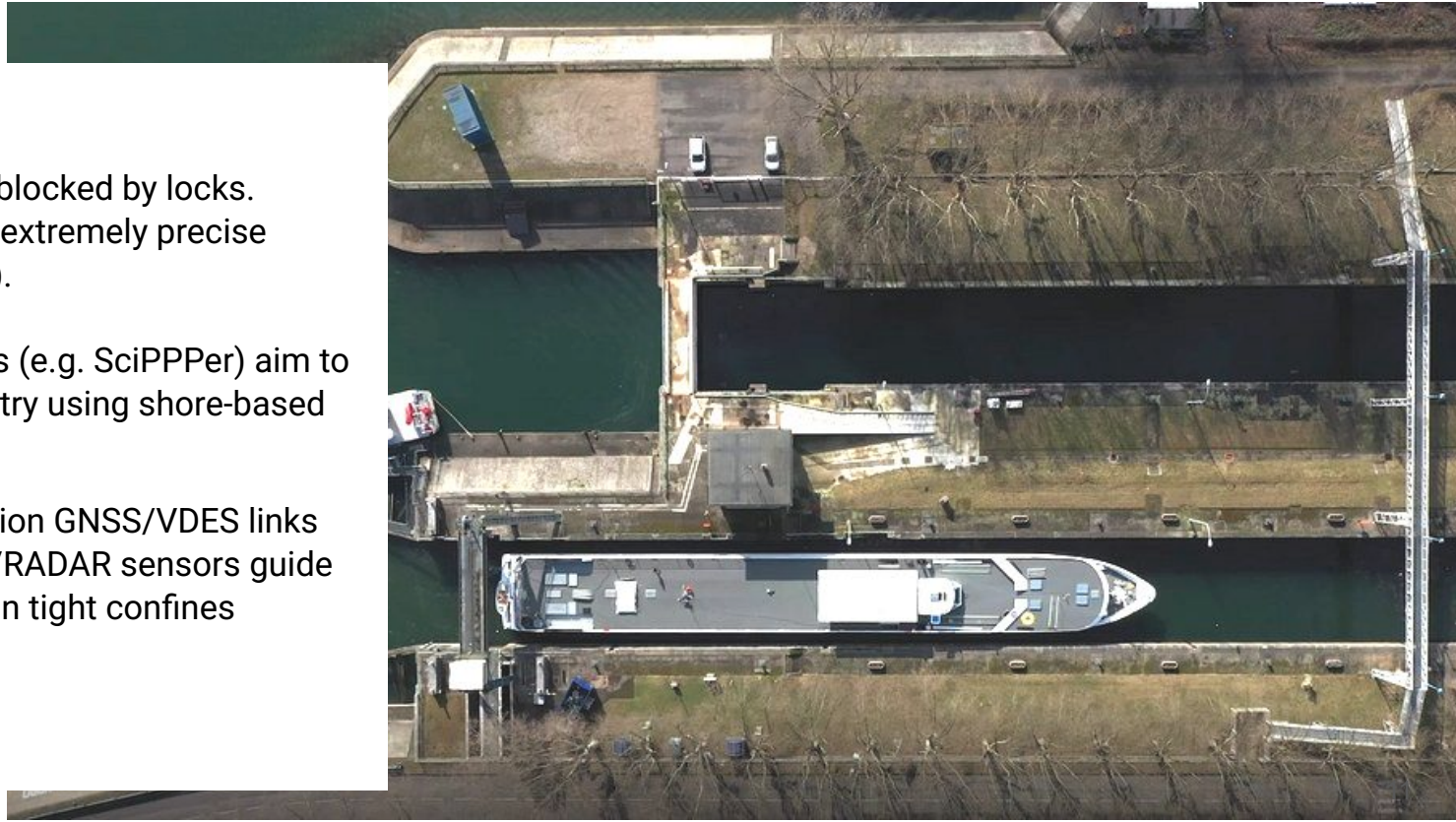
1. Automation path: **the lock problem**

AL4/5

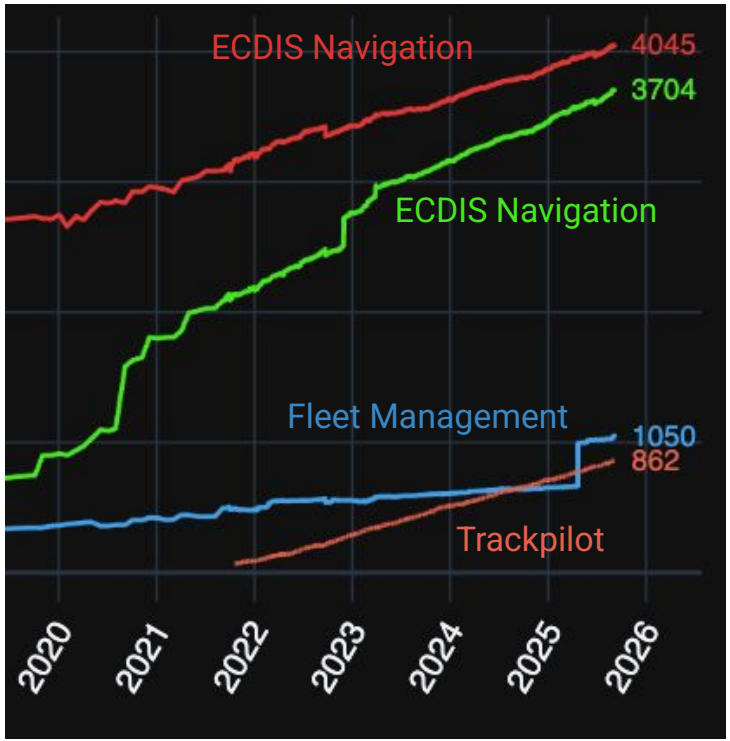
Full autonomy is blocked by locks. Passing a lock is extremely precise (≤30 cm margins).

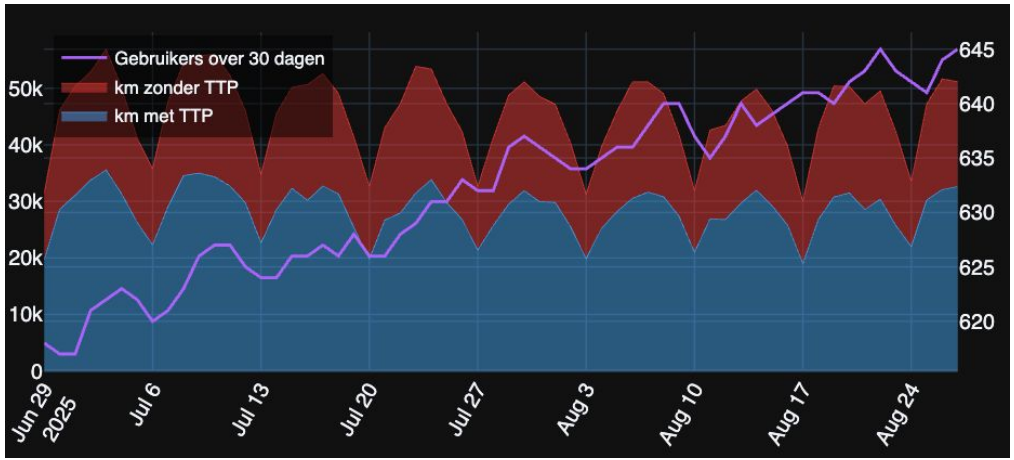
New R&D projects (e.g. SciPPPer) aim to automate lock entry using shore-based infrastructure:

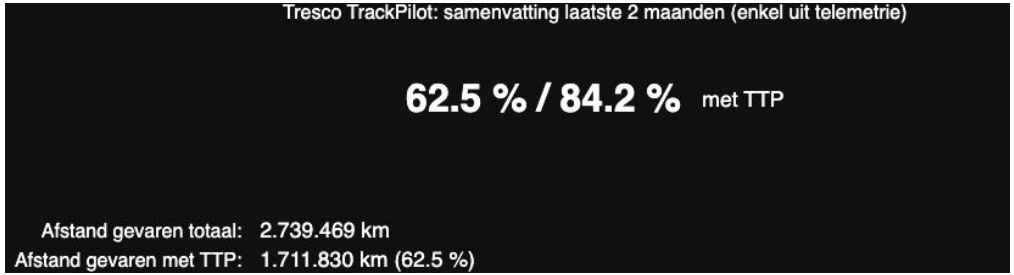
- high-precision GNSS/VDES links
- and LiDAR/RADAR sensors guide the vessel in tight confines



2. Innovation needs strong **ROI**. Journey from 10%→ 30% of the market







2. Innovation needs strong ROI: ***fuel efficiency***

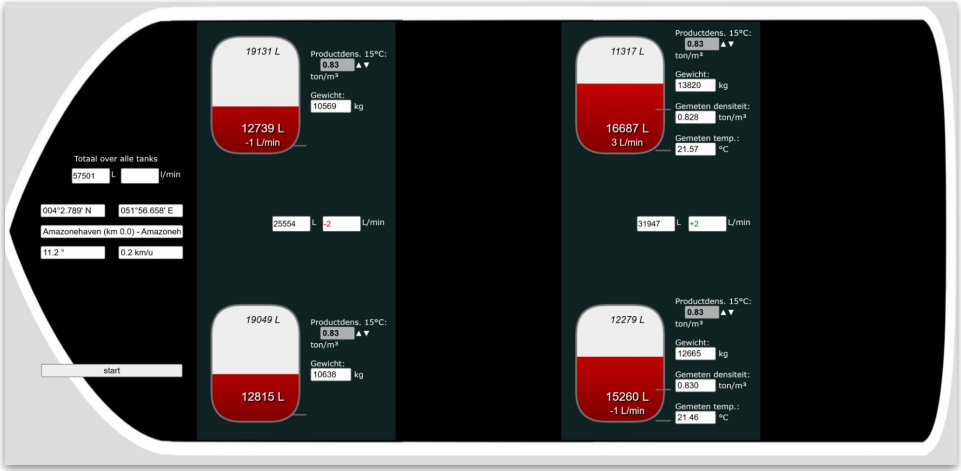
- **Fuel savings from smart steering:** Trackpilots trim unnecessary rudder and maintain optimal heading, which lowers resistance. Studies show fewer rudder movements directly cut fuel use.

  The result: **up to ~15% less fuel** in practice.

- **IMO endorsement:** The IMO explicitly cites TGAIN as a measure to improve a ship's efficiency and reduce emissions.

Lessons learned:

- a typical **400km** Antwerp–Duisburg trip
- **800l** fuel saved
- **+/- € 1.000** per trip thanks to smoother autopilot steering.
- These savings can often pay back the TrackPilot investment in ***days***, even before counting labor or safety gains.



3. Innovation needs ***user buy-in***

"*I* am the TrackPilot" → **"I am considerably less tired during and after the voyage. It's safe and comfortable"**

4. Quid remote sailing? **Automation in service of ROC's**

- **Remote vs. autonomous:**
  Remote sailing means a vessel is controlled by a captain at a Remote Operations Center (ROC) *on shore*.

- ROC setup: All ship **sensor data** (position, video, radar) is transmitted

- It is not fully crewless autonomy, but uses **automation** as **enabler**.

- Crew multiplier: **one** qualified captain on shore can oversee **many** ships in sequence. Vessels equipped with remote-ROC systems can be managed w **reduced onboard crew**.

- Regulation disclaimer: Onboard watcher: a **non-licensed watchkeeper**

5. Impacts on shore? → Data valorization

Terwijl de wachttijden bij containerafdeling oplopen, daalt de overslag in de Rotterdamse haven

Binnenvaartschepen en het wegvervoer in de Rotterdamse haven kampen met langere wachttijden dan gebruikelijk. Dat meldt het Havenbedrijf Rotterdam dinsdag bij de halfjaarcijfers. De Rotterdamse haven wordt om verschillende redenen dit jaar naar eigen zeggen geconfronteerd met 'uitzonderlijke drukte', en dat terwijl de overslag in de eerste helft van dit jaar juist is afgenomen.

STREMMING

Rijkswaterstaat kan 's nachts geen personeel vinden, dus gaat sluis Gr dicht in het donker

Het lukt vaarwegbeheerder Rijkswaterstaat niet om de roosters omtren nachtschuttingen van sluis Grave rond te krijgen. Gevolg is een nachteli stremming voor de scheepvaart.

BOOS

Hansweert volledig gestremd door personeelsgebrek Rijkswaterstaat

De sluizen bij Hansweert zijn dinsdag 11 juli vanaf 23.00 uur tot 6.00 uur woensdag volledig gestremd vanwege personeelsgebrek bij Rijkswaterstaat. KBN is met stomheid geslagen. 'Het loopt nu echt de spuigaten uit bij Rijkswaterstaat', zegt Leny van Toorenburg. Individuele schippers als Adrie Kuup zijn woest. 'Dit is een hoofdvaarweg, Rijkswaterstaat gooit toch ook niet de A2 even dicht?'

René Quist · Hansweert, 11 juli 2023, 18:22

Personeelsgebrek is vooral in de provincie Zeeland een groot probleem voor Rijkswaterstaat. © Foto Rijkswaterstaat

verlamt Rotterdamse haven

Nog nooit was de congestie zo groot in de Rotterdamse haven. Wachttijden van 60 tot 70 uur zijn eerder regel dan uitzondering voor de binnenvaart. Schuttevaer duikt deze week diep in de verstopte haven die ooit de grootste was in de wereld. Wat zijn de oorzaken, wat zijn de gevolgen? Deel 1: Een 'perfect' storm raast over de Europese containerhavens.

René Quist · Rotterdam, 15 juli 2025, 07:32

Serie: Congestie in de Rotterdamse haven

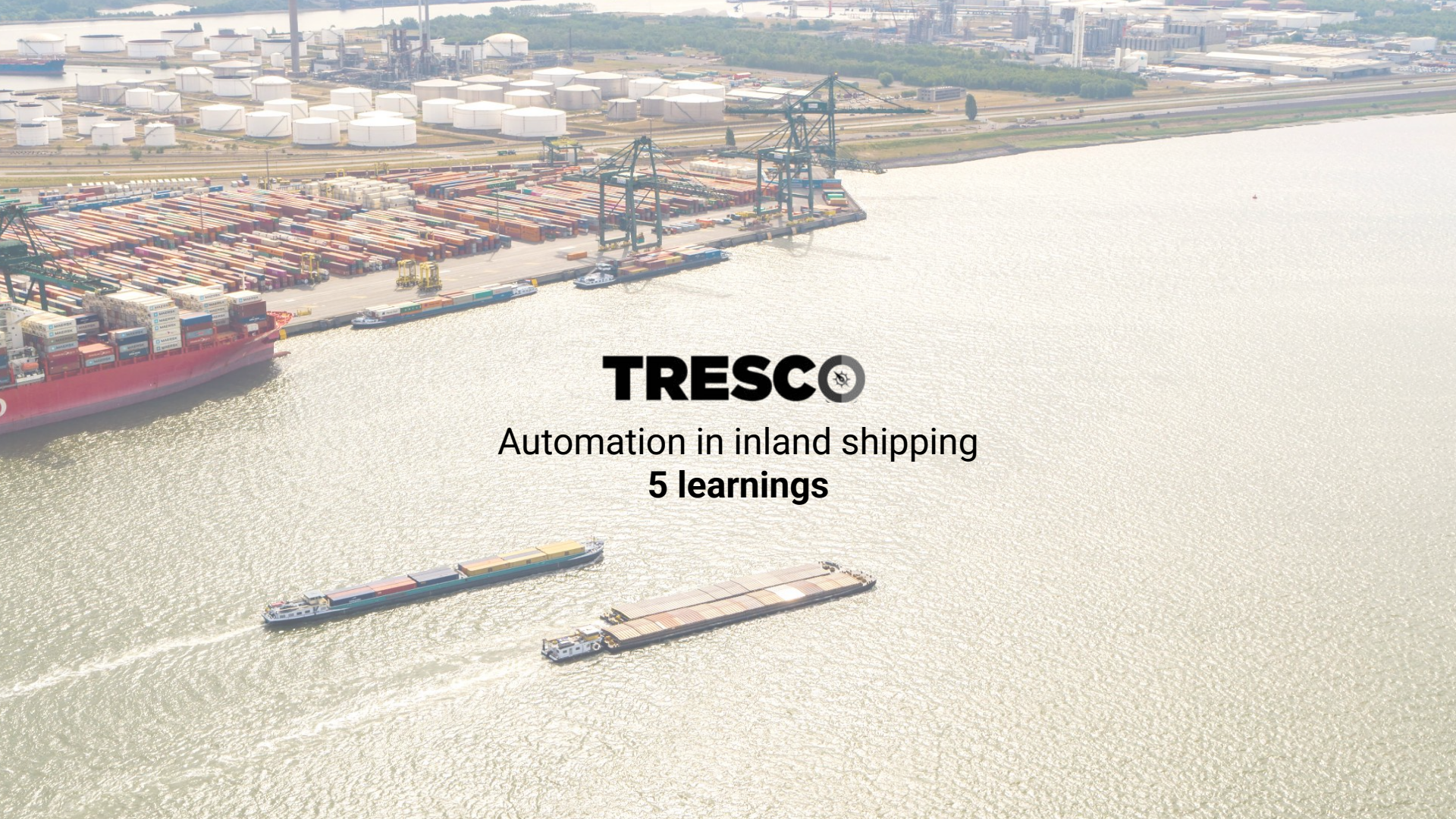
- **Staff shortage …**
- **Reduced errors & time:**

  Instead of radio check-ins, ports/locks can pull vessel data from the network.

  This cuts mistakes (radio mis-hearings) and speeds up locking/docking.

- **Commercial ROI:**

  Digitizing e-notifications and voyage reporting reduces admin time for both boatmen and authorities, yielding cost savings in operations and compliance.



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