25 CAREC
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Rail-Port Interoperability in the CAREC region

Session 7: Global Developments Reshaping Trade and Connectivity

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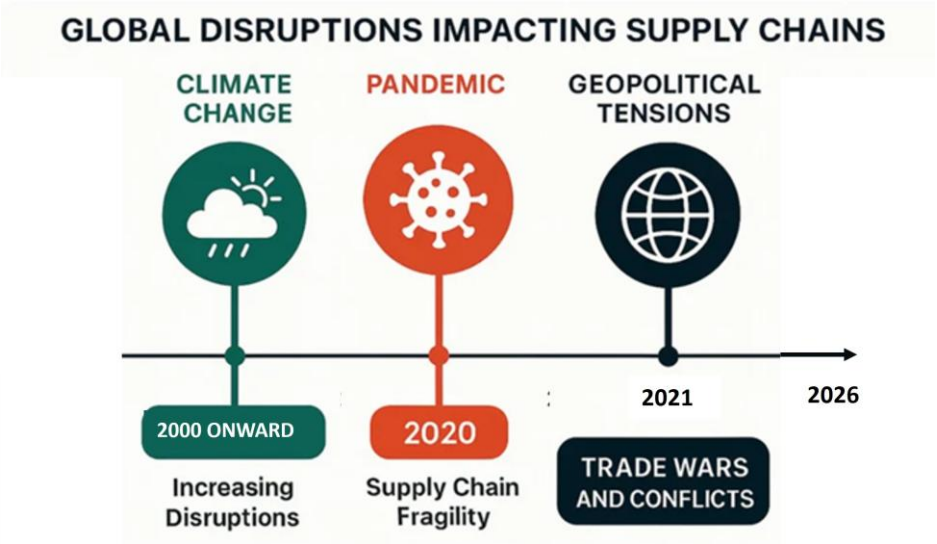
WHY THIS MATTERS



Global trade is no longer stable, predictable, or cost-efficient → Trade routes are being reconfigured in real time → Shipping reliability has declined → schedule integrity broken

Costs are volatile → insurance, fuel, charter, carbon pricing → Climate change is physically constraining waterborne transport → Decarbonization is structurally increasing costs

Implications: → Competitiveness is now defined by resilience and optionality → Rail–port interoperability is no longer operational — it is strategics

What “global developments” mean for CAREC

- Global shocks do not stay at ‘sea’ - they reprice the entire end-to-end logistics chain
- When global shipping lanes becomes unreliable or expensive, demand shifts to multimodal alternatives (rail + ports + ferries)
- CAREC corridors are no longer “backup options” - they are being stress-tested as live alternatives
- The binding constraint is not rail line capacity alone: it is the rail–port interface

Unprecedented global supply chain events

Covid-19 pandemic (2020–2023)→ Port congestion, fleet withdrawal, container imbalance, extreme freight escalation

Russia-Ukraine war (from Feb 2022)→ Black Sea constraints, sanctions, rerouting, commodity and energy trade disruption

Red Sea crisis / Suez diversions (from Nov 2023)→ Vessel rerouting, +6–10 day transit increases, major insurance and security costs

Panama Canal drought constraints (2023–2024)→ Reduced transit capacity, queuing, network redesign and longer routings

Additional structural shocks now shaping global shipping:

Persian Gulf / Strait of Hormuz tensions (ongoing)→ Strategic chokepoint risk (~20% of global oil flows)→ War-risk insurance escalation and potential fleet withdrawal from Gulf routes→ Increased charter volatility, tanker market exposure

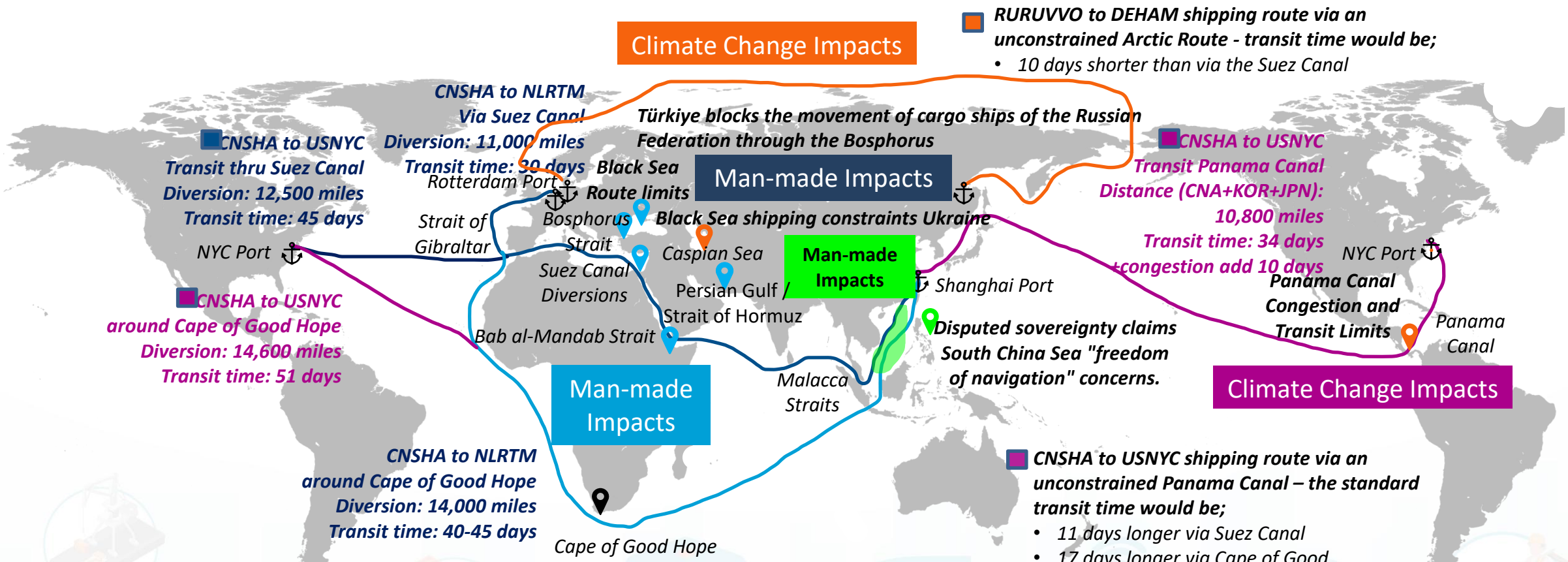
South China Sea tensions (ongoing)→ Strategic trade artery subject to geopolitical contestation→ Freedom of navigation risks affecting Asia–global trade routes→ Long-term uncertainty for routing, insurance and investment

Arctic Sea Route emergence (climate-driven)→ Potential reduction in Asia–Europe transit times→ Competing northern corridor with geopolitical access constraints→ Seasonal reliability, infrastructure gaps, and regulatory control risks

Climate change impacts (system-wide, accelerating)→ Water level variability (Caspian, Panama, inland waterways)→ Extreme weather disrupting ports and shipping schedules→ Physical constraints directly affecting vessel operations

Decarbonization of shipping (structural transition)→ IMO-driven emissions targets and carbon pricing→ Higher fuel costs and capital investment requirements→ Long-term upward pressure on freight costs

Unprecedented global supply chain events



Source: Authors construction of events with base line data from

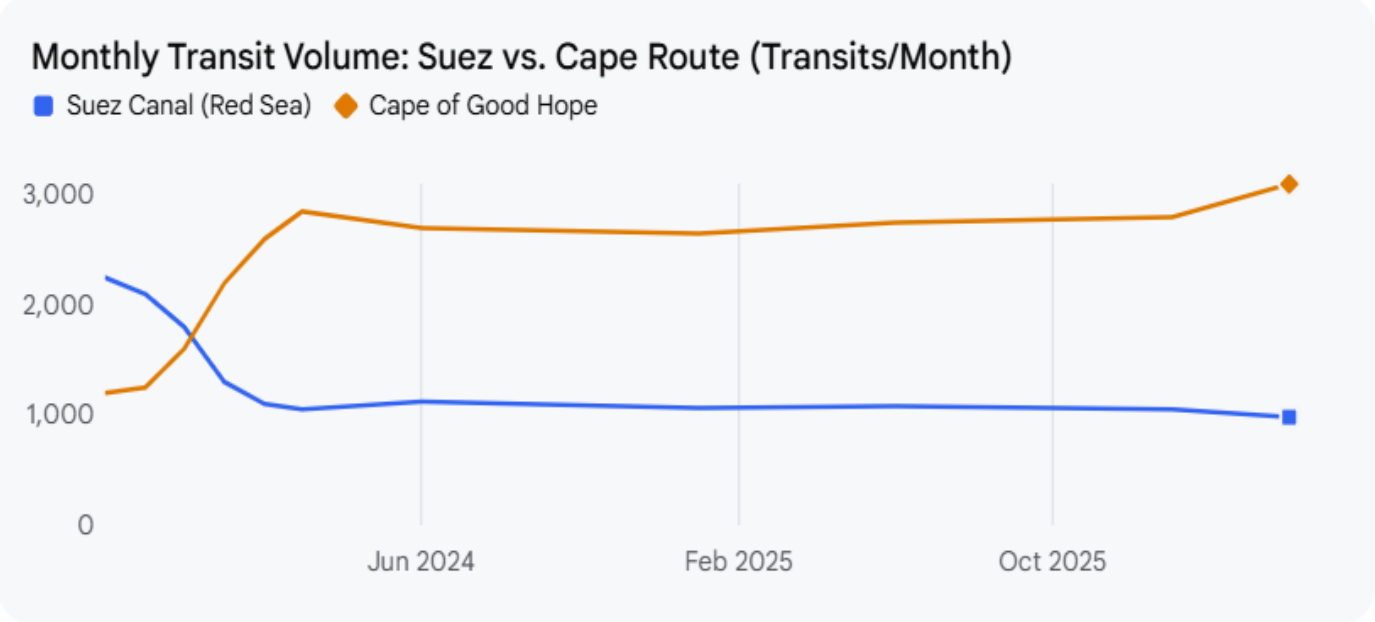
Route diversion is a competitiveness shock (time + distance)

Rank	Chokepoint	Main Constraint	Severity
1	Hormuz	Geopolitical / military	Extreme
2	Straits of Malacca	Traffic + capacity + security (piracy/geopolitics)	Extreme–High
3	Suez / Red Sea	Security + rerouting	High
4	Panama Canal	Climate / capacity	High
5	South China Sea	Geopolitical + strategic control + route concentration	High (escalating)
6	Turkish Straits (Bosphorus + Dardanelles)	Regulation + geometry	Moderate–High
7	Gibraltar	Traffic + weather + geometry	Moderate
8	Bering Strait	Climate + narrow geometry + geopolitical control	Moderate (future high)
9	Arctic routes (NSR)	Climate + geopolitics	Emerging

- Diversions are not “just longer sailings” - they destroy berth windows, asset cycles, and container availability
- Asia-Europe and Asia-USEC routings shift materially when chokepoints fail
- Transit time changes cascade into port congestion and inland dwell
- 2026 fuel prices force "Super Slow Steaming" to conserve expensive VLSFO, reducing effective fleet capacity

Source: Authors construction of global shipping choke points from JOC, UNCTAD and LOWEY Ins.

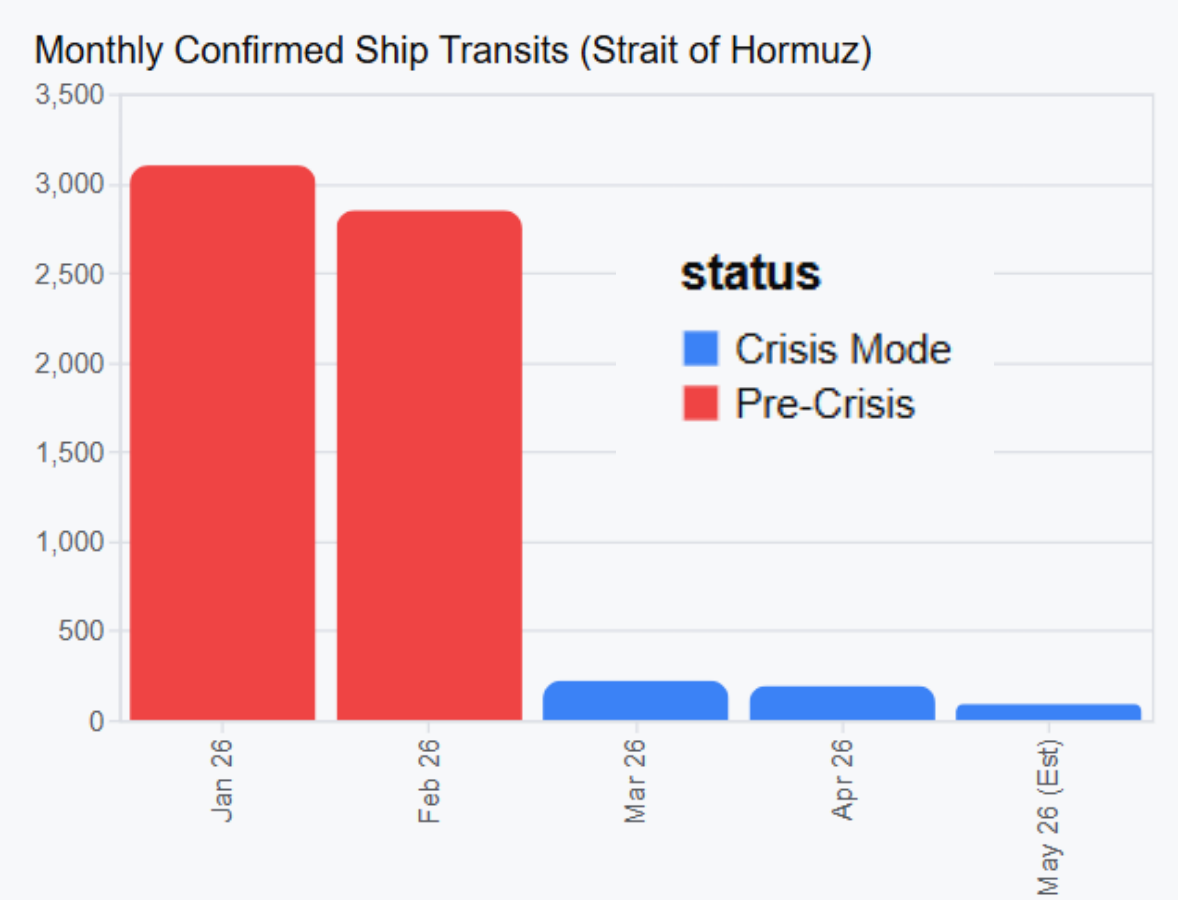
Suez / Red Sea disruption: observed traffic impacts



TRANS-CASPIAN CORRIDOR BENEFITS MARGINALLY AS A NICHE ALTERNATIVE — BUT DOES NOT OFFSET STRUCTURAL DEPENDENCE ON MARITIME ROUTES.

- IMF Port Watch-based reporting indicated Suez trade volume fell ~50% y/y in early 2024, while Cape of Good Hope flows surged strongly
- UNCTAD highlights chokepoint vulnerability, large declines in Suez transits 2024/25, with longer routes raising fuel, wage, insurance and chartering costs
- April 2026 = 980 via Suez and 3,100 via Cape of Good Hope

Hormuz Strait disruption: observed traffic impacts



Source: Authors construction from JOC, UNCTAD, Marine Traffic.

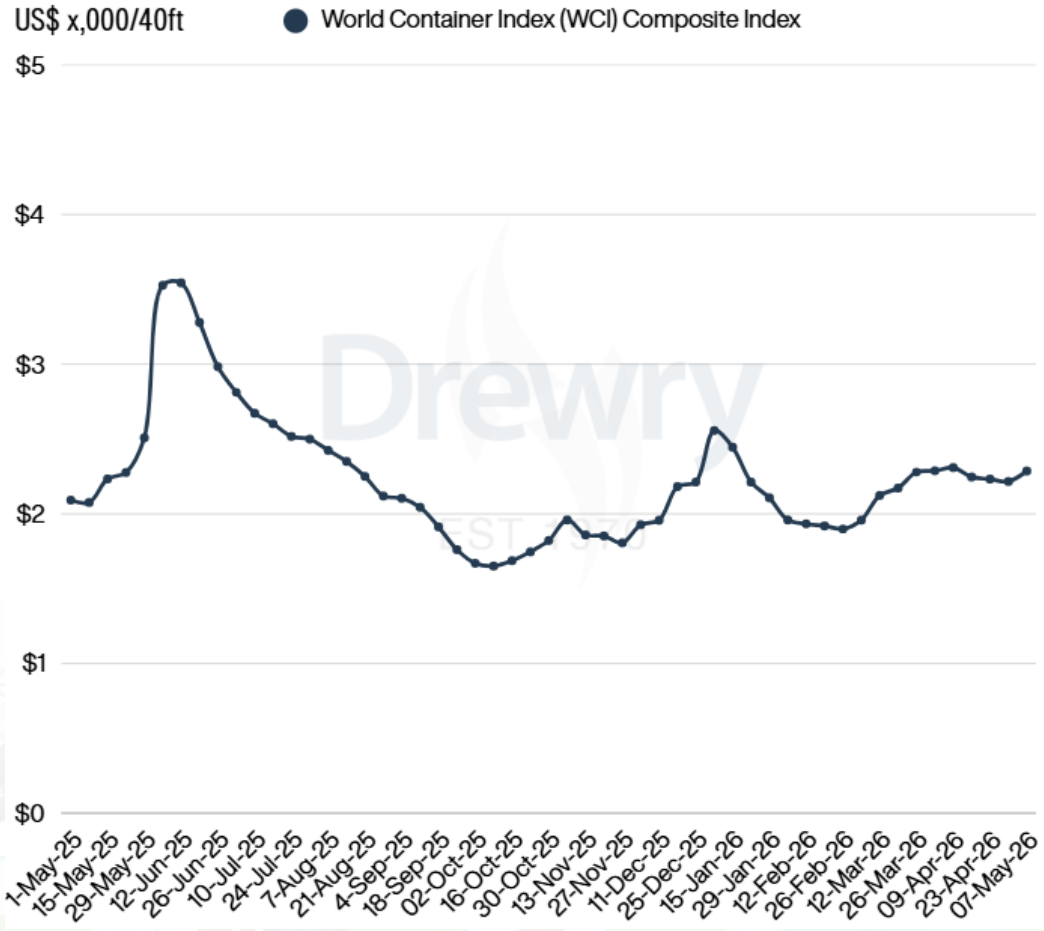
- IMF Port Watch and industry tracking indicate heightened disruption risk to Gulf shipping flows, vessel movements affected by security incidents, war-risk premiums, and operational uncertainty in the Strait of Hormuz and wider Persian Gulf
- UNCTAD highlights extreme vulnerability of energy chokepoints, disruption in Hormuz-handling a large share of global oil and LNG flows translates directly to higher fuel costs, insurance premiums, charter rates, and wider shipping cost escalation across global trade
- Unlike Suez disruption (route diversion), Hormuz disruption results in system-wide cost shocks with limited redirection of physical trade flows.

War risk + insurance: costs reprice route choice

- Red Sea war-risk premiums have been reported rising sharply in episodes of escalation (quoted around 0.7% vs ~0.3% of vessel value; sometimes up to ~1% in reporting)
- This is not marginal: it changes which ships can enter, which cargoes can get cover, and which ports remain “serviceable” in network planning
- If insurance is unavailable or punitive, “the corridor is closed” regardless of geography

Source: Authors construction from JOC, UNCTAD, Reuters and Middle East Logistics.

Container freight volatility (why rail alternatives spike)



- Spot rates keep moving with surcharges and network shifts; Drewry's WCI commentary (May 2026) explicitly notes pricing adjustments via Emergency Fuel Surcharges / Peak Season Surcharges and ongoing routing caution

- Key point for CAREC: volatility drives shippers toward corridors that can offer predictability, not just "cheaper per km"

Source: Authors construction from Drewry

Impact Matrix: Freight, BAF & War Risk

The table "Base Freight Rate" tracks Shanghai to Rotterdam (Asia-North Europe) route

Crisis Milestone	Base Rate (FEU)	BAF (Fuel Surcharge)	War Risk / Surcharges	Operational Impact
Russia-Ukraine (2022)	$8,000 – $10,000	**$1,100 – $1,450** (VLSFO Peak: $1,100/t)	$50 – $150 (Localized)	Black Sea blockade; global oil shock drives BAF to 13% of total cost.
Pre-Crisis Baseline (Late 2023)	$1,300 – $1,500	**$300 – $450** (VLSFO: $600/t)	$0	Market normalization; fuel prices stabilize.
Red Sea Crisis (Early 2024)	$3,500 – $4,000	**$600 – $800** (Consumption Spike)	$500 – $1,000	Cape diversion increases burn rate; higher tonne-mile demand boosts BAF revenue.
Peak Season (Mid 2024)	$5,000 – $6,000	**$800+** (PSS Blended)	Included in PSS	Capacity deficit compounds with tariff frontloading.
Market Normalization (Late 2025)	$1,800 – $2,000	**$400 – $500** (VLSFO: $450/t)	Localized	Newbuild deliveries absorb strain; fuel prices moderate.
Hormuz Crisis (May 2026)	**$6,000+**	**$1,600 – $1,800** (VLSFO: $1,201/t)	**$3,000 – $3,800**	Direct oil supply shock; carriers move to **bi-weekly BAF reviews**; total closure of Persian Gulf.

Source: Authors construction of freight adjustments with base line data from JOC, Alphaliners and Global Maritime Hub

CAREC multimodal system: where the stress lands

- Caspian system: rail-ferry capacity dependent
- Black Sea system: feeder shipping dependent
- Arabian Sea: gateway dependence
- Highly fragmented system across infrastructure, operations, institutions
- Bottom line: the rail-port interface is the weakest link in corridor performance

Shipping & Port Decarbonization —Reality (2026)

Technology & Market: Ready / Moving

- IMO 2023 Strategy net-zero shipping by ~2050, with ≥40% carbon intensity reduction by 2030
- Rapid shift toward low/zero-emission fuels (methanol, ammonia, hydrogen) and vessel efficiency measures
- Global fuel standards and emissions pricing architecture defined under IMO Net-Zero Framework (NZF)
- Scale of investment required:
  - ~US$4–4.5 t/year global energy transition by 2030
  - >$1 t for shipping (fleet+fuels+ports+supply chains)
- Ports must adapt simultaneously:
  - Alternative fuel bunkering
  - Shore power / electrification
  - Energy systems and storage

Policy & Economics: Uncertain / Fragmenting

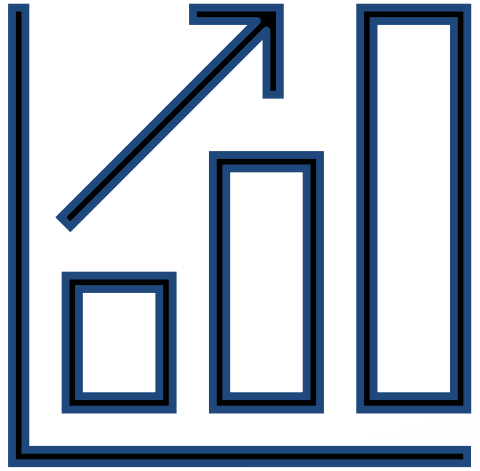
- IMO Net-Zero Framework not yet finalized; adoption delayed to late-2026 negotiations
- Strong opposition to global carbon pricing / fund mechanisms→ risks undermining the core financing model for transition
- Without global pricing:
  - Weak enforcement beyond existing CII compliance framework
  - Fragmentation into regional regimes (EU ETS, FuelEU, etc.)
- Industry faces:
  - Large cost gap between fossil and green fuels
  - Uncertain investment signals (timing, regulation, returns)
- Real-world impact already visible:
  - Surcharges and cost pass-through into freight rates
  - Increased cost exposure for trade (ports, shippers, end consumers)

Middle Corridor demand signal (why this matters now)

- The Trans-Caspian / Middle Corridor is repeatedly cited as a route diversification option; World Bank messaging highlights potential to triple volumes and halve travel time by 2030 with the right measures

- Current demand studies already cite strong growth / targets for TITR volumes and a possible 2030 scale-up – (this should be used as a planning signal, not a guarantee)

- Demand can surge faster than ports/rail-ferry/multimodal/feeder networks interfaces can adapt - so interoperability becomes the binding constraint.



Key Freight Demand Signals (2025–2026)

Rapid Volume Acceleration	• Volumes reached approximately 4.12 million to 5 million tonnes in 2025, a massive increase from ~2.76 million tonnes in 2023
Container Surge	• Container transport hit 77,000 TEU in 2025, up from just ~25,000 TEU in 2021.
Future Forecast	• The World Bank projects volumes will more than double to 11 million tonnes annually by 2030 if infrastructure upgrades continue.
Efficiency Gains - Transit Time	• End-to-end delivery from China to Europe dropped to 18–23 days by 2024 (down from 38–53 days), making the route commercially viable for time-sensitive goods.
China-Europe Integration	• In 2024, freight from China via the TITR increased sharply, signaling a strategic shift by Chinese exporters to "de-risk" from the Northern Corridor (Russia).

CAREC Middle Corridor (TITR) — Role, Performance and Constraints

STRATEGIC ROLE

- The Trans-Caspian International Transport Route (TITR / Middle Corridor) connects Central Asia and Western China to Europe
  - Provides a strategic alternative to:
  - Northern Corridor via Russia
  - Maritime routes via Suez / Red Sea / Cape of Good Hope
- Increasing importance driven by:
- Geopolitical disruptions (Russia–Ukraine, Red Sea)
- Supply chain diversification and resilience requirements

CORRIDOR STRUCTURE

- Multimodal corridor combining:
  - Rail → Caspian Sea ferry → Rail → Black Sea / Türkiye → Europe
  - Core route: China → Kazakhstan → Caspian Ports (Aktau/Kuryk) → Azerbaijan (Baku/Alat) → Georgia → Türkiye / Black Sea → EU
- Key infrastructure:
  - Baku–Tbilisi–Kars (BTK) railway (operational since 2017)
  - Baku Port expansion (capacity ~15 → 25 million tonnes; ~500,000 TEU)

CAREC Middle Corridor (TITR) — Role, Performance and Constraints

PERFORMANCE

- Transit time:
  - ~18–25 days China–Europe (best case, improving)
  - Faster segments: ~15 days to Türkiye via South Caucasus
- Traffic growth:
  - ~2.8 million tonnes (2023), ~86% increase YoY
  - Target trajectory:~4+ million tonnes (near-term)~11 million tonnes potential by 2030 (with investment)e
- Trend:
  - Rapid growth—but from a low base relative to maritime routes

CORE CONSTRAINTS

- Caspian Sea bottleneck
  - Limited ferry capacity and weather disruptions
- Multiple border crossings / modal breaks
  - Fragmented operations and documentation
- Lack of integrated corridor management
  - No single operator / tariff structure
- Infrastructure gaps
  - Port capacity, rail bottlenecks, logistics services)
- Result:
  - Corridor remains less competitive on cost vs maritime routes and inconsistent in transit time

CONCLUSION — WHAT THIS MEANS FOR CAREC

This is not a temporary disruption — it is a structural reset of global trade	• Global shipping is now defined by volatility, cost escalation, and geopolitical risk — not efficiency.
CAREC corridors are no longer optional — they are being tested by the market	• Demand is shifting toward multimodal routes offers reliability & alternative access.
The binding constraint is no longer rail capacity — it is the rail–port interface	• Fragmentation, port inefficiencies, and weak intermodal coordination now determine corridor performance.
The Middle Corridor will not scale through incremental fixes	• Structural limits (fleet, terminals, interfaces) mean step-change investment and coordination are required.

CALL TO ACTION (FOR RWG / TSCC)

- Move from corridor planning → corridor integration
- Prioritize rail–port interfaces as core infrastructure, not secondary assets
- Align investments across ports, rail, ferries, and operations — not in silos
- Establish corridor-level coordination / accountability mechanisms

Thank you for attending

Questions