

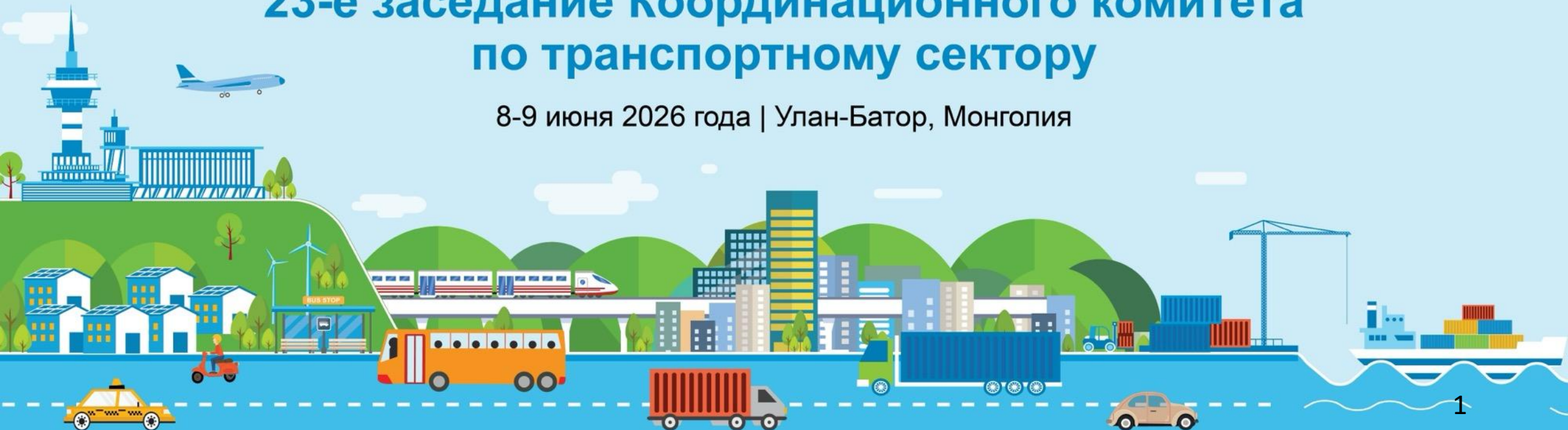


23rd Transport Sector Coordinating Committee Meeting

8-9 June 2026 | Ulaanbaatar, Mongolia

23-е заседание Координационного комитета по транспортному сектору

8-9 июня 2026 года | Улан-Батор, Монголия



CAREC Transport Model and Pan-Asian Supply Chain Analysis

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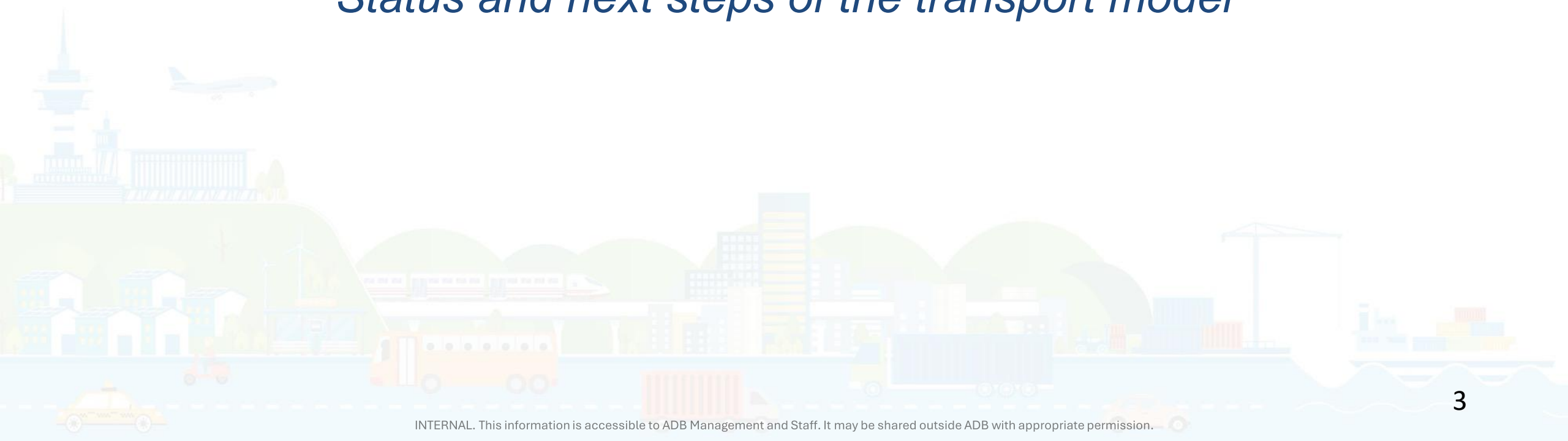
Transport Modeling Consultant (online)

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Part I: Pan-Asian Transport Model

Status and next steps of the transport model



Current Status of the Transport Models

- **Legacy Models**

ADB developed two CUBE-based transport models by 2021:

- i. CAREC Transport Model
- ii. Strategic Investment for Transport Model (SIFT) covering CAREC, SASEC, and GMS regions.

- **Identified Model Limitations**

Limitations include outdated datasets, uneven data, limited transparency, and constraints on scenario testing and usability.

- **Need for other Regional Cooperation Models and Pan-Asian Expansion**

Other regional cooperations frameworks (GMS, SASEC) also benefit from updated transport models. Pan-Asian supply chain study requires broader coverage.

- **Scoping Study Conducted**

A scoping study was conducted to identify the best suited model structure and management.

ADB and CAREC Institute will be involved.

ADB's socio-economic and GIS data will be fully utilized.

Key Findings from the Scoping Study (Jan–Jun 2026)

- **Expanded Geographic Coverage**

The study highlights the need to unify CAREC, GMS, and SASEC regions in a single integrated model environment.

- **Data Organization and Harmonization**

Improving consistency in socio-economic data, trade flows, and transport costs across regions is critical.

- **Usability and Transparency**

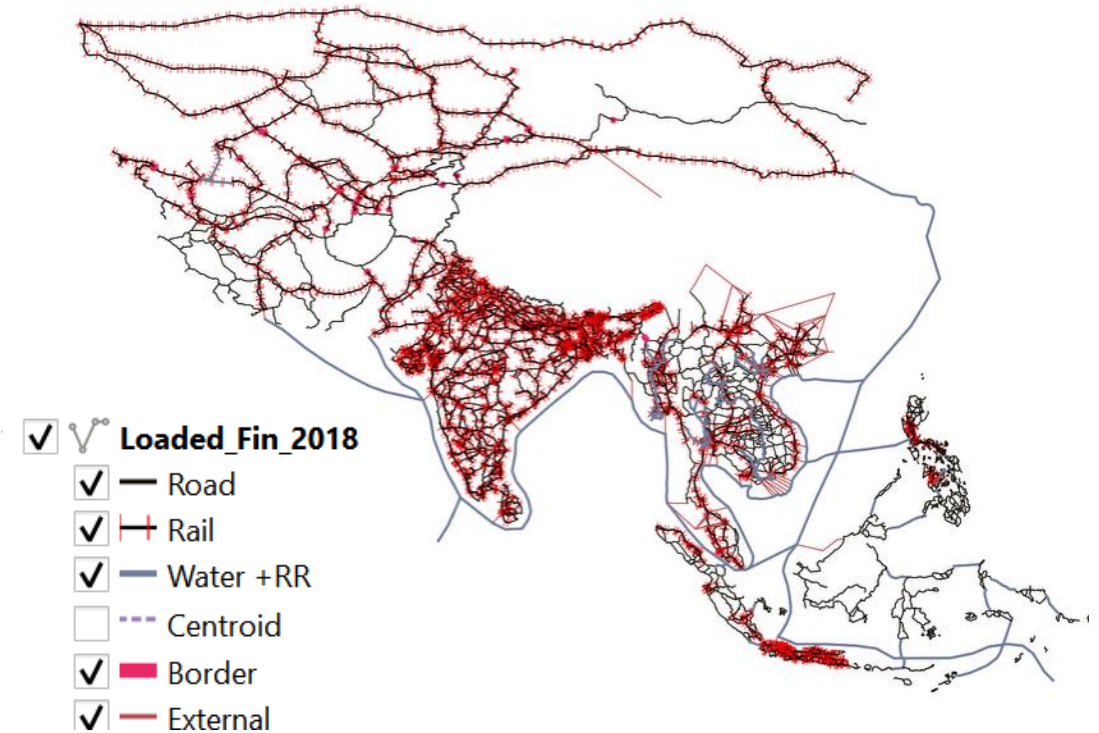
Current model limits use due to proprietary software and technical complexity, requiring improved accessibility.

- **Enhanced Scenario Analysis**

Strengthening capabilities to assess infrastructure, policies, and shocks is a priority for model upgrades.

- **Modular and Future-Proof Design**

The model should allow incremental enhancements and tool integrations without major restructuring.



Part II: Pan-Asian Supply Chain Study

TA-10655 REG: Regional Connectivity, Logistics, and Supply Chain Transformation in Asia and the Pacific



Pan-Asian Supply Chain Study

- **Regional and global impacts**

Recent geopolitical risks and natural hazards impact beyond subregional framework such as CAREC.

- **Technical assistance study initiated**

A technical assistance (TA 10655-REG) was approved in Nov 2025 to study impacts of typical supply/value chains in pan-Asian scale.

- **Pan-Asian economic corridor development**

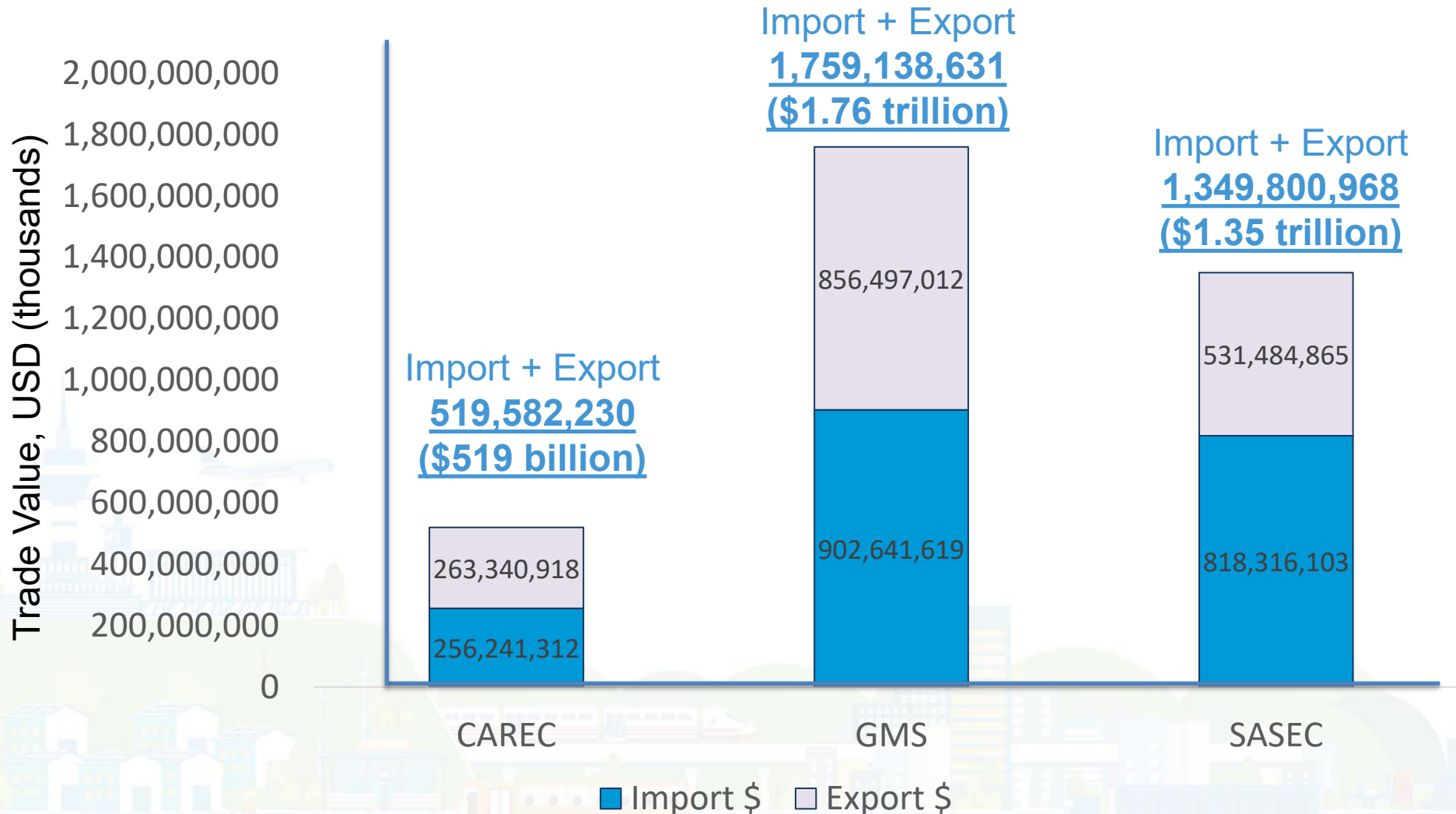
ADB organized a high-level seminar, “*Pan-Asian Corridors—Driving Resilient Connectivity and Economic Competitiveness*” in the 2026 Annual Meeting in Samarkand.

- **Linkage of CAREC Corridor 4a and Corridor 2**

The TA assessed linkage of Mongolia (Corridor 4) with other CAREC countries.

Foreign Trade Levels in CAREC, GMS and SASEC

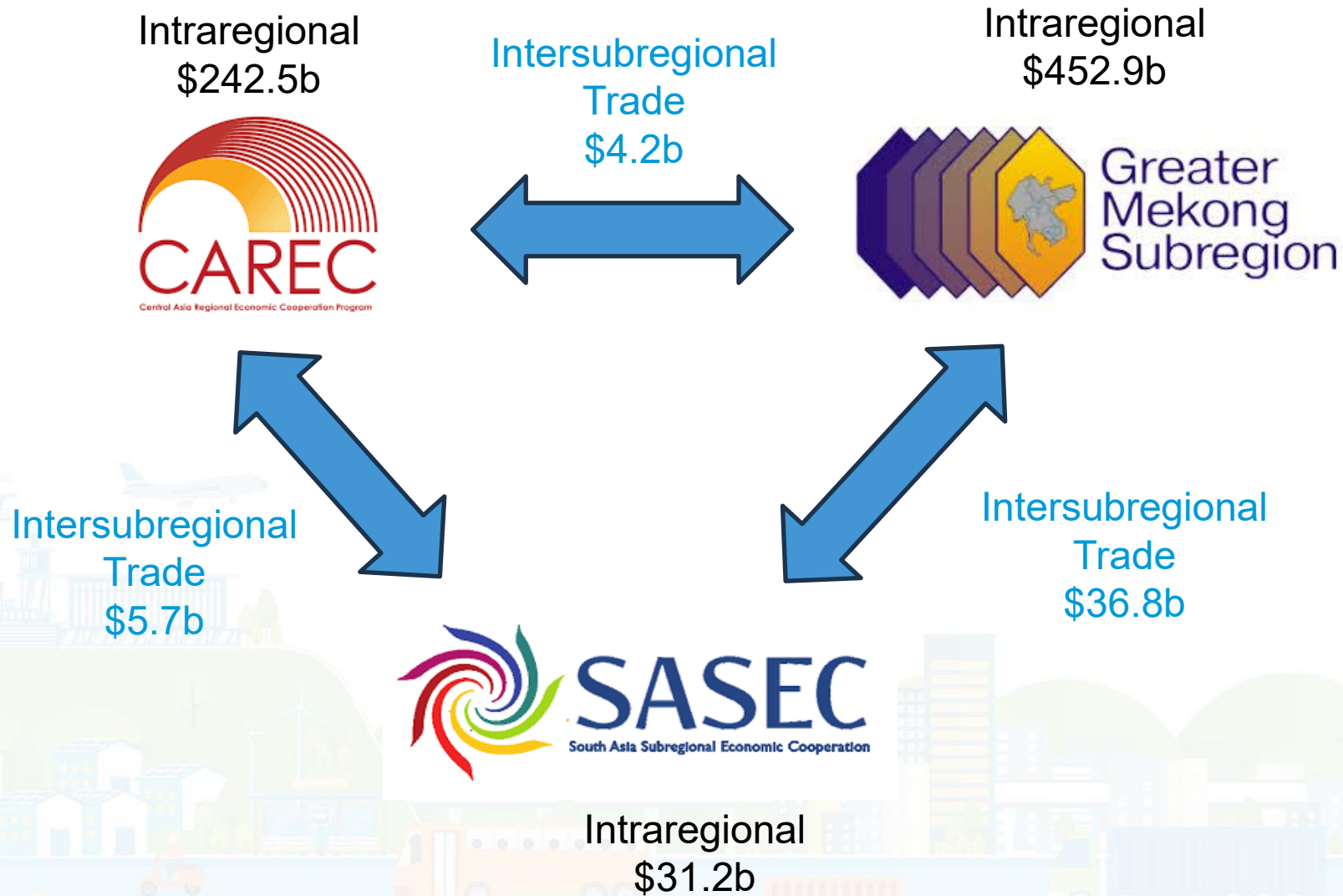
2024 data



Key Take-Aways	
✓	GMS has the highest level of foreign trade at \$1.76 trillion.
✓	SASEC is next with trade volume of \$1.35 trillion.
✓	CAREC is third with \$519 billion.

Source: Compiled from International Trade Center (ITC TradeMap, various national customs authorities, national statistics office

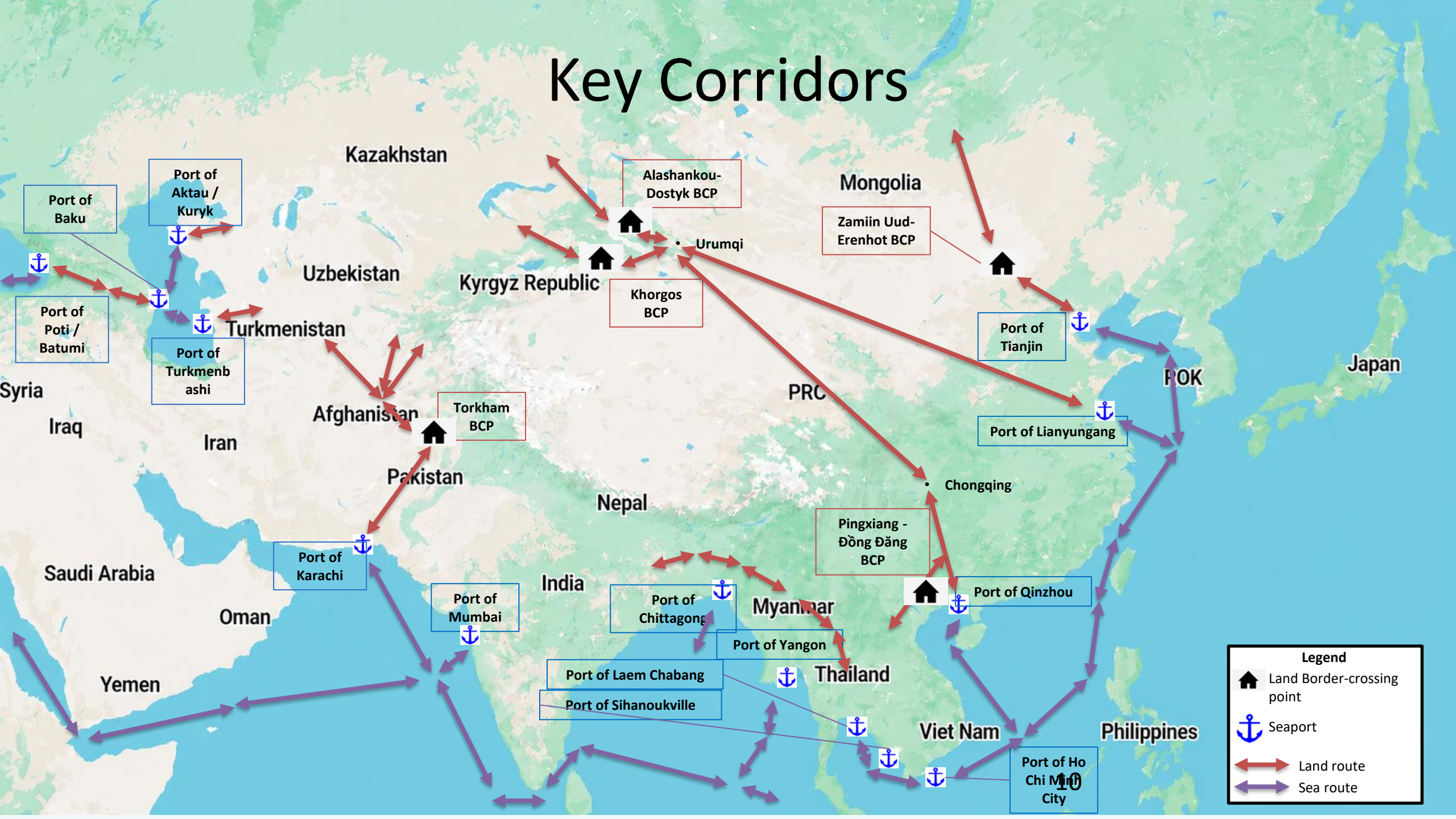
Intersubregional Trade Dynamics



Key Take-Aways

- ✓ Intrasubregional trade levels tend to be higher than the intersubregional trade levels, particularly for landlocked region (e.g. CAREC).
- ✓ SASEC is an exception, due to the presence of one large economy (India) and maritime linkages with GMS.

Key Corridors

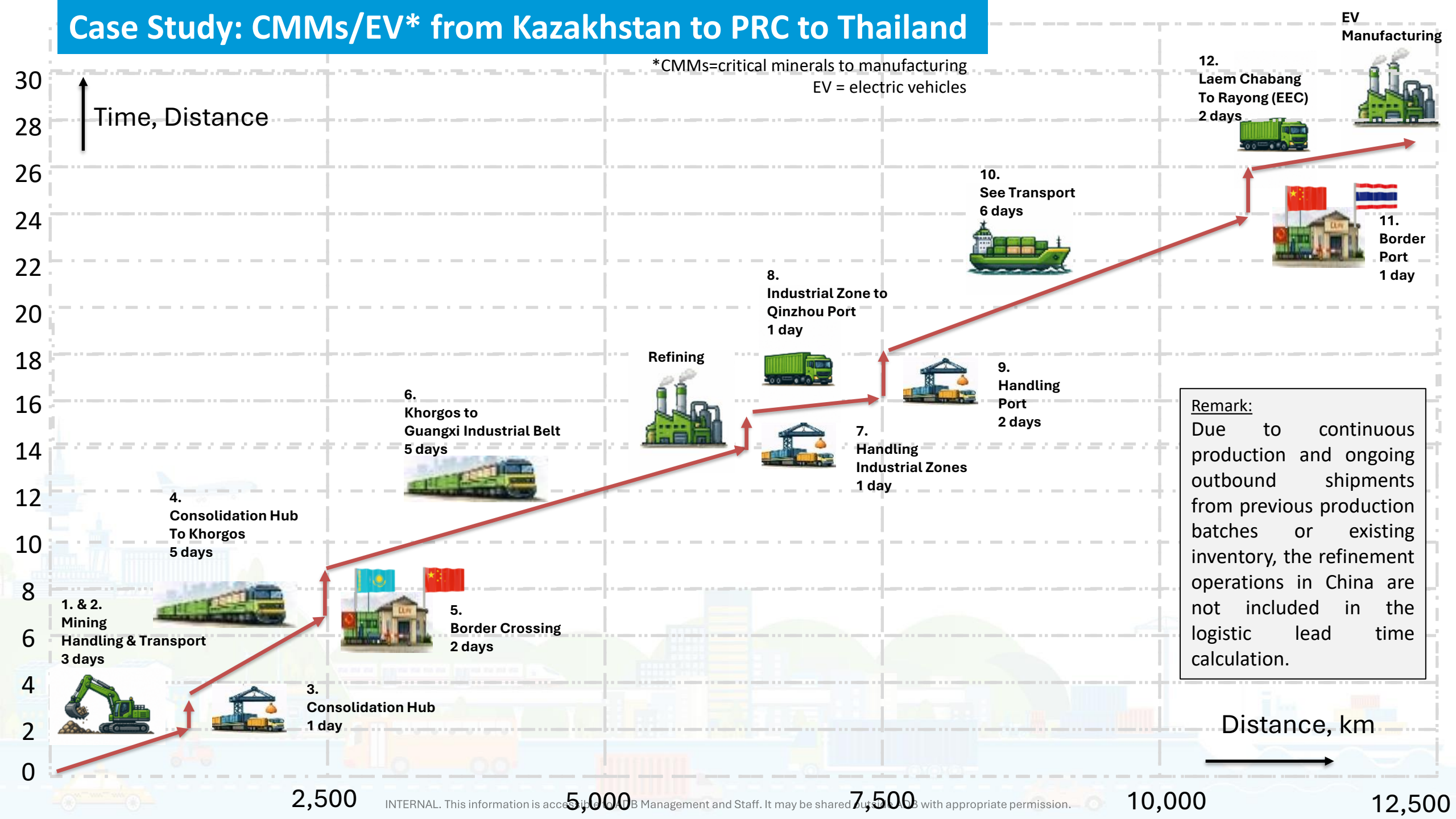


Legend

- House icon: Land Border-crossing point
- Anchor icon: Seaport
- Red arrow: Land route
- Purple arrow: Sea route

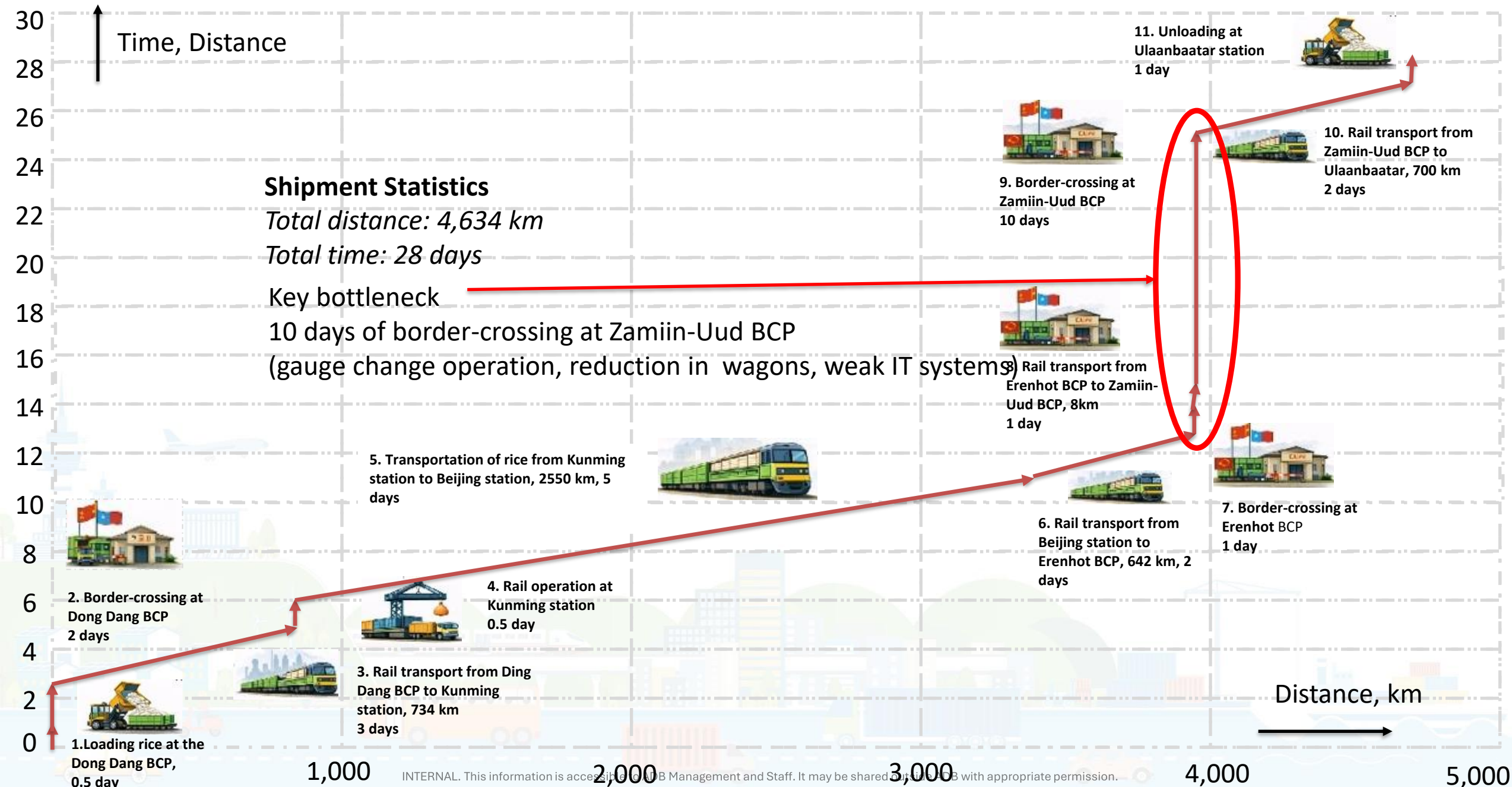
Case Study: CMMs/EV* from Kazakhstan to PRC to Thailand

*CMMs=critical minerals to manufacturing
EV = electric vehicles



Remark:
Due to continuous production and ongoing outbound shipments from previous production batches or existing inventory, the refinement operations in China are not included in the logistic lead time calculation.

Case Study: Rice Shipment from Viet Nam to Mongolia



Mongolia's Exports to CAREC and Europe

All values in USD, thousands

Importers	2019	2024	2025	YoY* (2024-2025)	CAGR** (2019-2025 years)	Commodities
Azerbaijan	34	1,917	3,376	76.1%	115.2%	Sheep/goat meat, Animal fats, Guts, Edible Offals
Georgia		2	0	-100.0%	N/A	Machinery, Electrical appliances
Kazakhstan	6,235	6,802	13,215	94.3%	13.3%	Horse meat, Motor cars, Knitted items, Food preparations, Sheep/goat meat
Kyrgyzstan	413	2,577	17,297	571.2%	86.4%	Gold, Self-propelled bulldozers, Motor cars, Cheese and Curd, Transmission apparatus
Pakistan		2,429	0	-100.0%	N/A	Animal hair
PRC	6,772,663	14,406,010	14,027,023	-2.6%	12.9%	Copper ores and concentrates, Coal, Iron ores and concentrates, Feldspar, Wool and fine or coarse animal hair
Tajikistan		136	1,571	1055.1%	N/A	Meat of bovine, sheep/goat and horse, Motor cars
Turkmenistan			77		N/A	Meat of sheep or goats
Uzbekistan	59	5,923	25,163	324.8%	174.4%	Meat of sheep or goats, Live sheep and goats, Meat of horses, Potatoes, Edible offal of bovine animals
Europe	506,608	932,849	1,292,352	38.5%	16.9%	Precious metals, Horse hair, Knitted apparels and clothings

*YoY = Year on Year (2024 to 2025)

**CAGR = compound annual growth rate (2019 to 2025). The year 2019 is selected to cover trade levels before COVID-19.

Source: Mongolian Customs Service (<https://gaali.mn/en/hscode>) and ITC TradeMap (<https://www.trademap.org/>)

1. Mongolia's exports to CAREC economies have been rising from 2019 to 2025, particularly to the **five Central Asian Republics showing very strong growth** from 2024 to 2025.
2. **Europe is a large trading partner** by value, with yoy growth of 38.5%, up from, the 16.9% growth rate from 2019-2025.

Mongolia's Imports from CAREC and Europe

All values in USD, thousands

Exporters	2019	2024	2025	YoY* (2024-2025)	CAGR** (2019-2025 years)	Commodities
Azerbaijan	78	301	391	29.9%	30.8%	Pastries, Fresh Fruits, Cider, Nuts
Georgia	1,360	2,464	1,877	-23.8%	5.5%	Wine, Tea, Medicaments, Fruit juices, Water
Kazakhstan	29,108	47,346	45,177	-4.6%	7.6%	Cigars, Bread, Electrical Parts for Railways, Dairy products, Cyanides
Kyrgyzstan	339	1,614	1,409	-12.7%	26.8%	Bread, Butter, Chocolate, Onions,
Pakistan	2,186	4,351	4,027	-7.4%	10.7%	Soap, Medicaments, Women's or girls' suits, Men's or boys' suits, Bread
PRC	2,036,805	4,640,648	4,605,039	-0.8%	14.6%	Motor vehicles , Telephone sets, Structures and parts of structures, Bars and rods, of iron or non-alloy steel, Self-propelled bulldozers
Tajikistan	10	71	89	25.4%	44.0%	Sugar confectionery, Chocolate, Bread, Onions, Nuts
Turkmenistan	79	25	295	1080.0%	24.6%	Bread, Chocolate, Sugar confectionery , Raw hides and skins, Tanned or crust hides and skins of goats
Uzbekistan	2,025	4,726	6,540	38.4%	21.6%	Chocolate, Chocolate, Bread, Motor cars , Grapes
Europe	2,416,811	3,890,411	3,804,883	-2.2%	7.9%	Mineral fuels, Machinery and mechanical appliances, Pharmaceuticals, Automobiles, Fertilisers

*YoY = Year on Year (2024 to 2025)

**CAGR = compound annual growth rate (2019 to 2025). The year 2019 is selected to cover trade levels before COVID-19.

Source: Mongolian Customs Service (<https://gaali.mn/en/hscode>) and ITC TradeMap (<https://www.trademap.org/>)

1. Imports have also grown steadily, showing consistent expansion despite some slowdown year-on-year.
2. Main imports from CAREC economies comprised of food and beverage, but a wider range of industrial and consumer products were seen to come from Kazakhstan, Pakistan and PRC.
3. Europe is a key source of merchandize, where Mongolia imports energy, machineries and equipment as well as pharmaceuticals , automobiles and fertilizers.

Freight Tonnage Across 4a, 4b and 4c All units in tonnes

In terms of freight tonnage, 4a serves **12.2%**, 4b serves 71.7% and 4c serves 16.1% of the cross-border traffic between Mongolia and PRC (using average of 2024 and 2025 data).



Main exports

Coal, iron ores and concentrates, precious stones and semi-precious stones, meat

Main imports

Cement, asphalt, motor vehicles, vehicle parts, trailers and semi-trailers, steel products, furniture, assortment of consumer products

Corridor 4a (2024-2025)

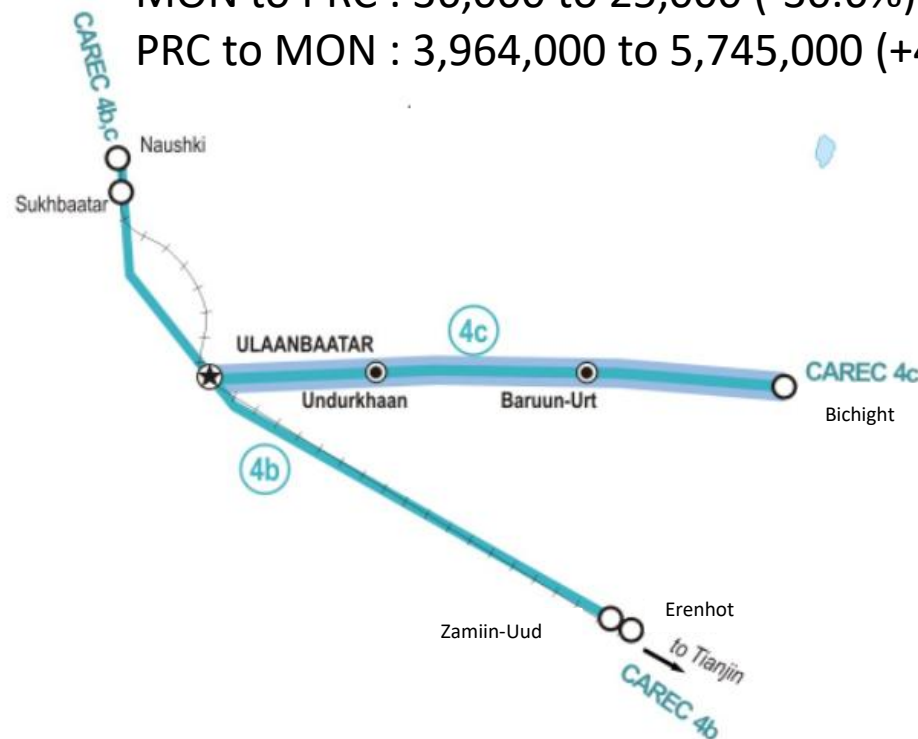
MON to PRC: 3,915,000 -> 3,200,000 (-18.3%)

PRC to MON: 97,800 -> 101,700 (+4.0%)

Corridor 4c (2024-2025)

MON to PRC : 36,000 to 25,000 (-30.6%)

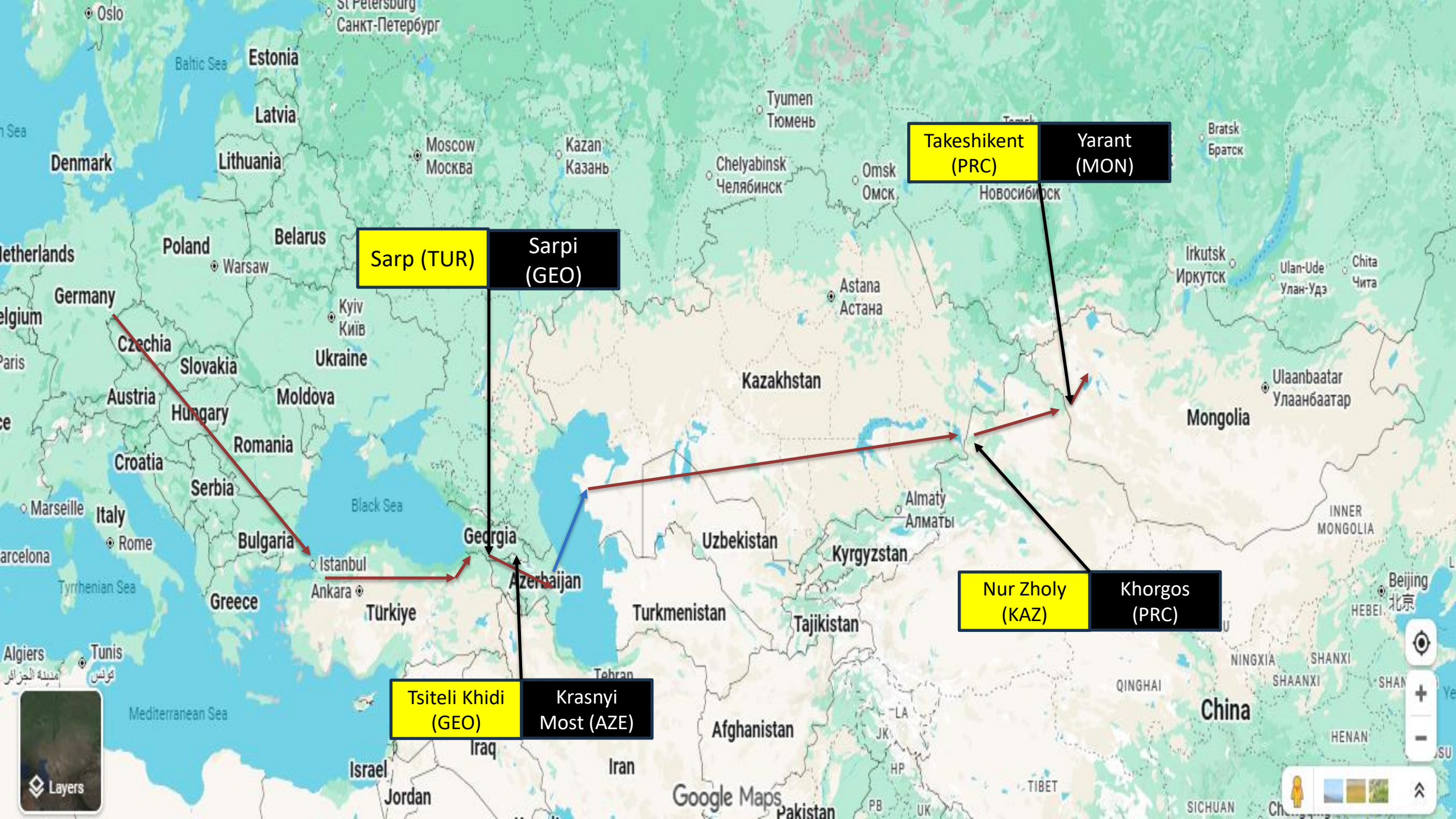
PRC to MON : 3,964,000 to 5,745,000 (+44.9%)



Corridor 4b (2024-2025)

MON to PRC : 15,641,000 -> 16,390,200 (+4.8%)

PRC to MON : 5,414,000 -> 5,846,300 (+8.0%)



Sarp (TUR)

Sarpi (GEO)

Tselikhi Khidi (GEO)

Krasnyi Most (AZE)

Takeshikent (PRC)

Yarant (MON)

Nur Zholy (KAZ)

Khorgos (PRC)

Investment Thesis for CAREC Corridor 4

Current ADB Initiatives

ADB is implementing the Border Efficiency for Sustainable Trade (BEST) Project in Mongolia (approved December 2023), alongside ongoing support through the Regional Improvement of Border Services (RIBS) Project, to modernize border facilities, digitize customs processes, and enhance cross-border operational efficiency.

The improvement of both Tsagaannuur and Bulgan BCP along Corridor 4a are included in the project.

Trade Trends

In recent years, Mongolia has been active in concluding trade agreements with the Central Asian Republics (e.g. Uzbek-Mongolian Business Forum in May 2026)

The strong foreign trade growth, particularly between Mongolia and Central Asian Republics, warrant consideration to upgrade CAREC Corridor 4a. This offers the shortest route connecting Mongolia with the five Central Asian Republics.

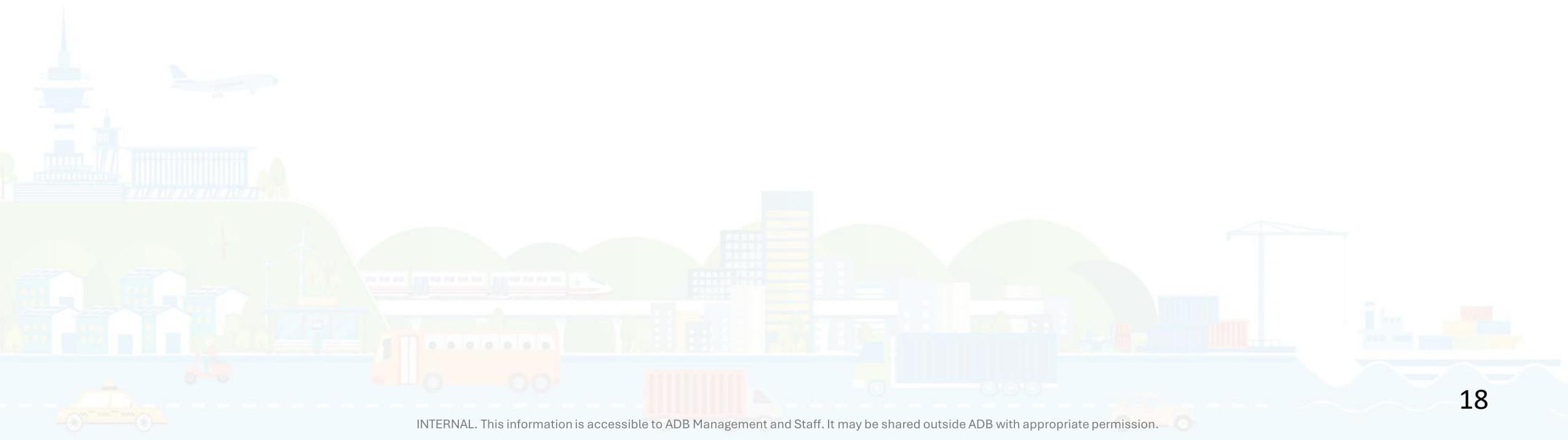
New Opportunities

While 4b is the main trade corridor, 4a should be developed further to improve connectivity with

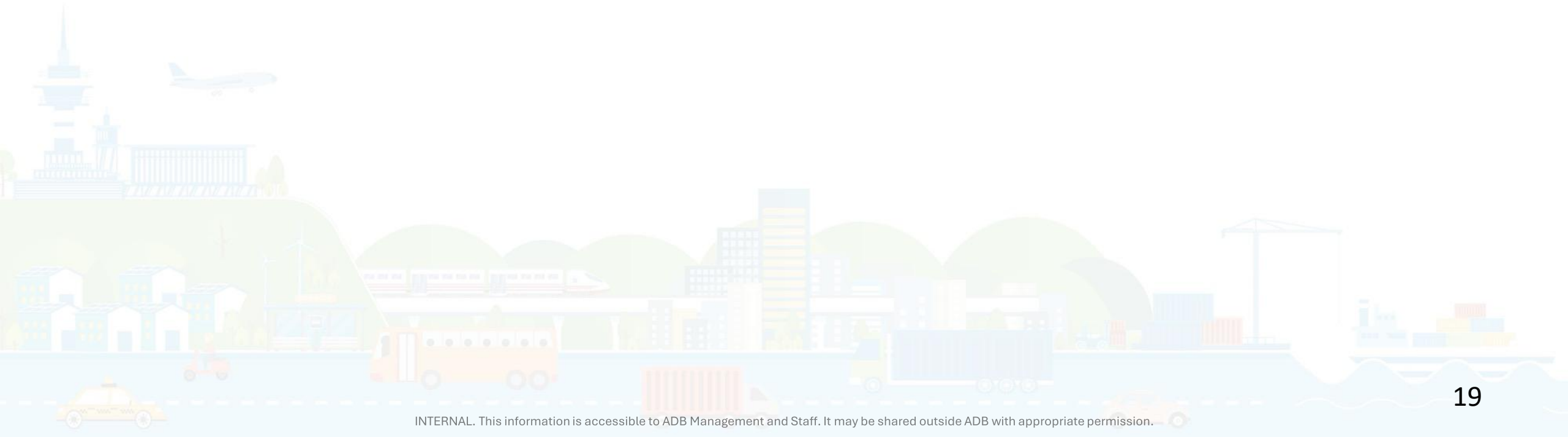
- Central Asia Republics
- South Asia
- Europe

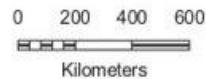
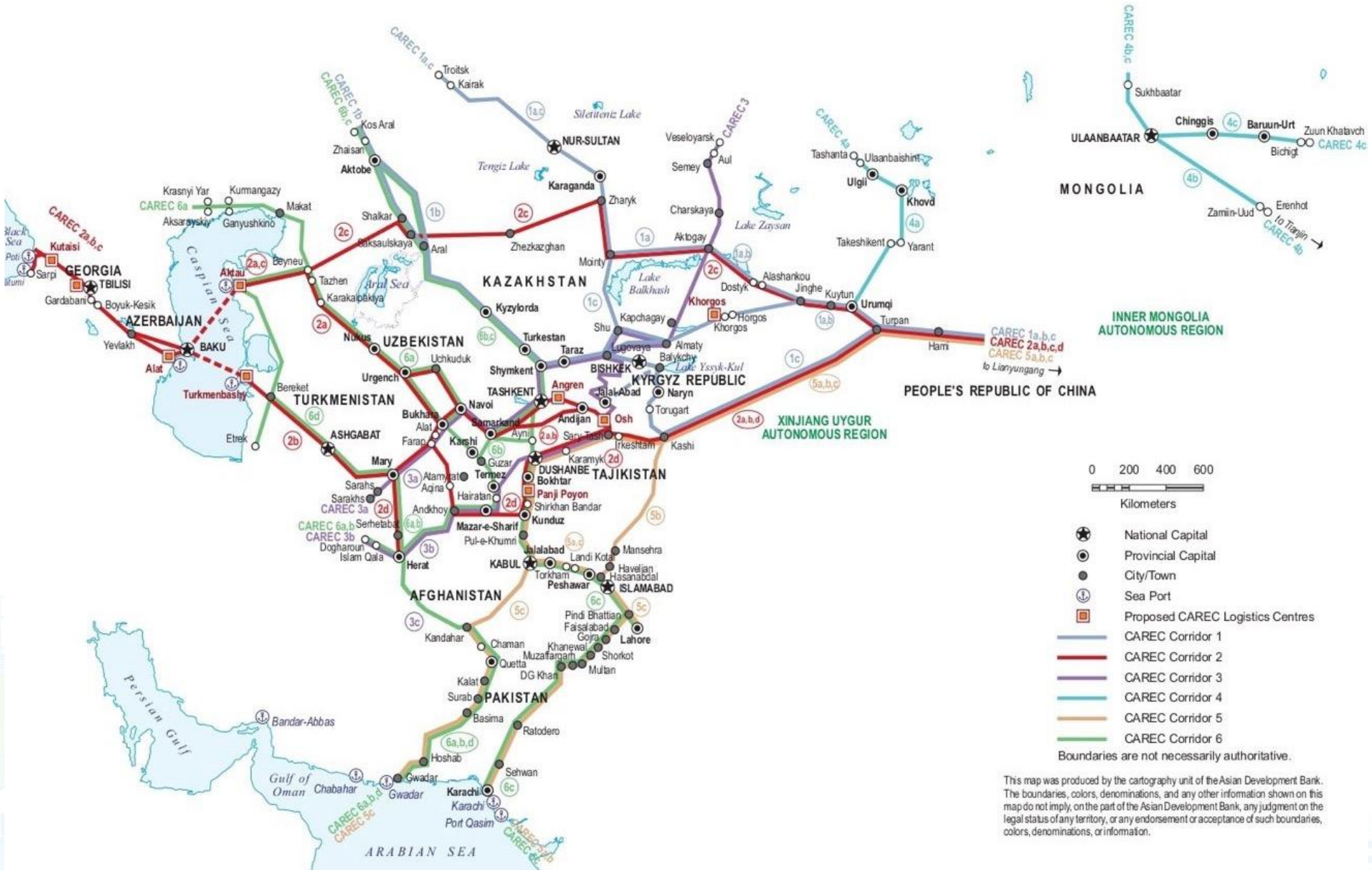
By connecting 4a with Corridor 2, Mongolia can also tap into Trans-Caspian International Route, Black Sea and reduce reliance on transit across the Russian Federation.

Thank you.



Appendix (English Only)





- National Capital
 - Provincial Capital
 - City/Town
 - Sea Port
 - Proposed CAREC Logistics Centres
 - CAREC Corridor 1
 - CAREC Corridor 2
 - CAREC Corridor 3
 - CAREC Corridor 4
 - CAREC Corridor 5
 - CAREC Corridor 6
- Boundaries are not necessarily authoritative.

This map was produced by the cartography unit of the Asian Development Bank. The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the Asian Development Bank, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries, colors, denominations, or information.

Transport Model—Next Steps

- **Consultant Recruitment and Role**

A specialized consultant will implement model upgrades, including expanding coverage and updating datasets.

- **Model Architecture and Data Integration**

Tasks include upgrading the Pan-Asian model based on the existing SIFT model and integrating socio-economic and trade data for accuracy.

- **Phased Upgrade Roadmap**

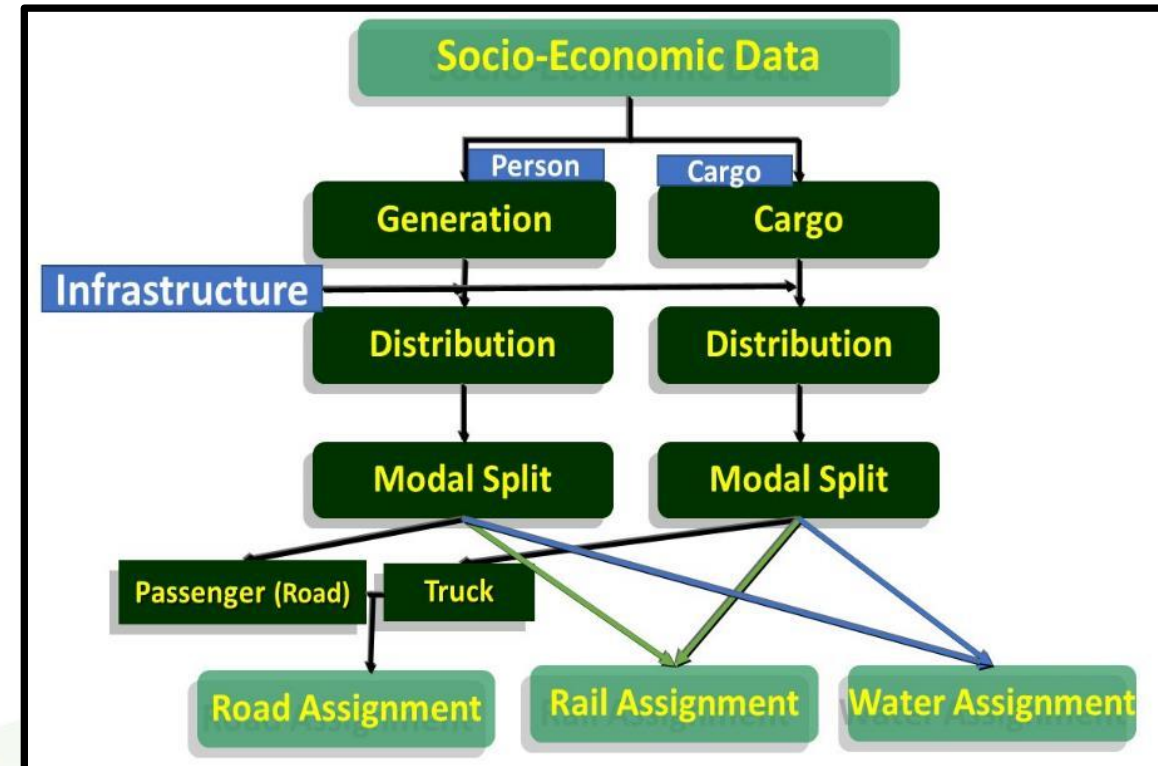
The upgrade roadmap uses a modular approach for early delivery and future enhancements.

- **Capacity Building and Training**

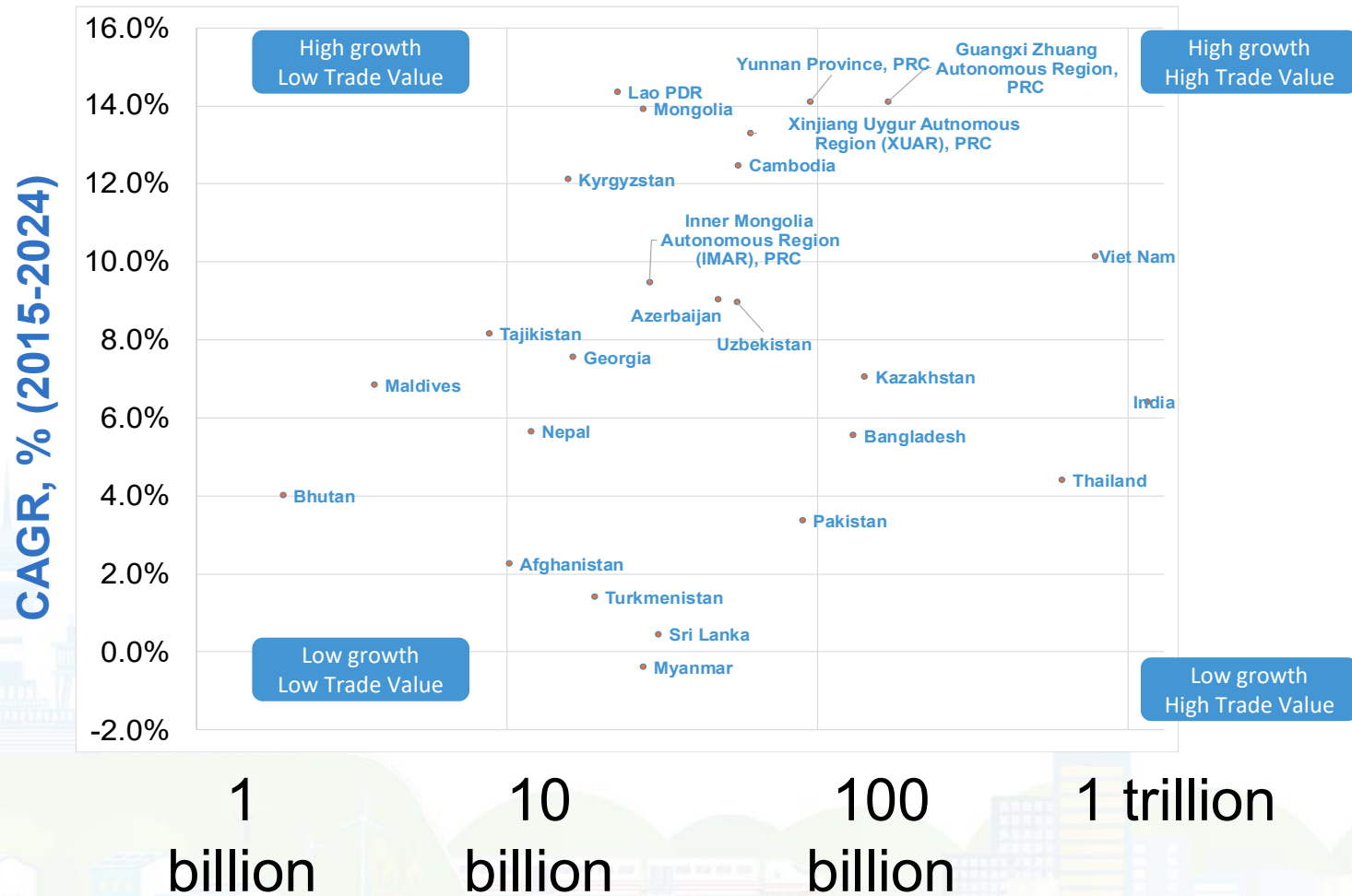
Training sessions will empower staff and stakeholders to operate and interpret the model independently.

- **Applications After Upgrade**

The upgraded model will support evidence-based, data-driven diagnosis of regional transport networks and the assessment of investment plans from a network perspective.



Trade Volume and Growth Review



Key Take-Aways

- ✓ Viet Nam is in the high growth/value quadrant (10.1%, \$782 billion)
- ✓ Cambodia, Laos, Kyrgyz Republic and Mongolia, as well as regional economies (Guangxi, XUAR and Yunnan) achieved CAGR > 10%.

Source: Compiled from International Trade Center (ITC) TradeMap, various national customs authorities, national statistics office

Trade Value in 2024, USD

Logistics Performance

No.	Country	LPI Rank	LPI Score
1	PRC	19	3.7
2	Thailand	34	3.5
3	India	38	3.4
4	Viet Nam	43	3.3
5	Sri Lanka	73	2.8
6	Georgia	79	2.7
7	Kazakhstan	79	2.7
8	Bangladesh	88	2.6
9	Uzbekistan	88	2.6
10	Bhutan	97	2.5
11	Mongolia	97	2.5
12	Pakistan	97	2.5
13	Tajikistan	97	2.5
14	Cambodia	115	2.4
15	Lao PDR	115	2.4
16	Kyrgyz Republic	123	2.3
17	Afghanistan	138	1.9

Key Take-Aways

- ✓ By LPI ranking, PRC, Thailand and Vietnam are the top three.
- ✓ Afghanistan, Kyrgyz Republic and Lao PDR are bottom three.
- ✓ Widely varying logistics performance across the economies, where landlocked countries tend to underperform -> overland corridors will be strategic to integrate those economies.

Azerbaijan, Turkmenistan, Myanmar, Nepal, and Maldives not included in the LI 203 study. .

#1: Connectivity: Key Observations

Corridors connect economies, bottlenecks constrain integration

No	Observations	Remarks
1	Geography and distance are critical constraints	Extremely long-distance supply chains (>9,000 km from Central Asia to GMS), Heavy reliance on: Rail corridors (CAREC) , Multimodal (rail + sea via PRC ports)
2	Multimodal logistics is essential but inefficient	Most intersubregional supply chains require combinations of road, rail and water. Each transfer introduces handling costs, delays, and coordination challenges.
3	Border-crossing points (BCPs) are often the weakest links	Time-cost-distance analysis shows border delays can exceed transport time itself. The Viet Nam–Mongolia rice case spent 10 days at Zamiin-Uud BCP, accounting for over one-third of total transit time.
4	Significant logistics performance gaps exist across economies	LPI rankings range from PRC (19th) to Afghanistan (138th), indicating uneven corridor quality and logistics capabilities that constrain seamless regional integration.
5	Maritime gateways remain critical despite growth in land corridors	Ports such as Tianjin, Lianyungang, Qinzhou, Karachi, Chittagong, Laem Chabang, and Ho Chi Minh City act as essential interfaces.
6	Corridor redundancy is limited and creates vulnerability	Many supply chains depend on a small number of strategic nodes (e.g., Khorgos, Alashankou, Zamiin-Uud, Petrapole-Benapole). Congestion, conflict, or disruption at these nodes can affect entire regional supply chains.

#2: Politics: Key Observations

Geopolitics increasingly shapes regional supply chain resilience.

No	Observations	Remarks
1	Political stability is a prerequisite for regional connectivity	Supply chains perform best when transit routes remain predictable. Political unrest, conflict, and border closures can quickly disrupt otherwise efficient corridors.
2	Afghanistan–Pakistan tensions create uncertainty for South-Central Asia connectivity	Border closures since 12 October 2025 affected transit reliability, limiting Afghanistan and Pakistan role as a bridge between CAREC and SASEC.
3	Myanmar's internal instability weakens the land bridge between GMS and SASEC	Conflict has reduced the effectiveness of east-west and north-south corridors, increased transport risks, and constrained cross-border trade and investment.
4	Thailand–Cambodia border tensions highlight the vulnerability of regional supply chains	Even localized disputes can disrupt freight movements, tourism flows, border operations, and investor confidence in key GMS corridors.
5	Transit dependence requires stronger regional cooperation mechanisms	Many landlocked economies depend on neighboring countries for market access, making bilateral and multilateral agreements essential to ensure uninterrupted transit.
6	Political shocks often accelerate regional cooperation and corridor development	Recent disruptions, including the Middle East crisis and maritime security concerns, have increased interest in resilient overland corridors, border modernization, and transport facilitation initiatives.

#3: Economy: Key Observations

The three subregions are economically complementary, but much of the value creation still occurs outside the producing countries.

No	Observations	Remarks
1	Significant opportunities exist for regional value chains linking resource-rich CAREC with manufacturing hubs in GMS and SASEC.	The Kazakhstan → PRC → Thailand EV supply chain illustrates how CAREC provides critical minerals, PRC provides refining and battery processing, and Thailand provides EV manufacturing.
2	Agriculture demonstrates strong economic complementarity across the three subregions.	CAREC has surplus wheat and livestock products, while GMS and SASEC contain large food-processing industries and consumer markets. There are strong complementarity but long distance and high shipment cost erode such cooperation's benefits (e.g. export of Kazakh wheat to GMS is more expensive than supplies from Australia or US)
3	Renewable Energy theme is creating new sources of regional demand for the three subregions.	India targets 30% EV sales by 2030, Thailand aims to become an EV production hub, and several SASEC countries are implementing EV incentives. This is increasing demand for lithium, nickel, cobalt, graphite and rare earths.
4	Narrow and similar industrial products to similar destinations result in competition of exports.	Many economies within the same subregion produce similar commodities and export products, resulting in direct competition rather than specialization.

#4: Supply Chain: Key Observations

The region has the ingredients for integrated regional value chains, but supply chains remain fragmented, concentrated, and vulnerable to disruptions.

No	Observations	Remarks
1	Processing and manufacturing capacity are highly concentrated.	CAREC economies largely supply raw materials, while most mineral refining occurs in the PRC and manufacturing is concentrated in Thailand, India and the PRC. This creates dependency on a small number of processing and manufacturing hubs.
2	Logistics costs are driven more by delays and handling than by transport itself.	Time-cost-distance analysis shows that waiting, transloading, customs clearance, port handling and border procedures often contribute more to lead times than the actual movement of goods.
3	Limited availability of specialized logistics services constrains value-chain development.	The region faces shortages of cold-chain facilities, specialized warehouses, testing laboratories, battery logistics capabilities, and advanced third-party logistics providers, particularly in smaller economies.
4	New energy transition supply chains are emerging faster than supporting logistics systems.	Demand for EVs, batteries and critical minerals is growing rapidly, but supporting regulations, infrastructure for charging stations, specialized transport services, hazardous materials handling capabilities are not developing at the same pace.
5	Potential for modal shift to more efficient and greener modes of transport.	Many economies still rely on road transport. Shift to rail or inland waterway could increase competitiveness but face resistance due to multimodal infrastructure gaps and resistance from trucking sector. 27

#5: Trade: Key Observations

Value chains drive trade; commodities alone cannot

No	Observations	Remarks
1	Trade remains heavily oriented toward extra-regional markets rather than neighboring economies.	Many CAREC economies export minerals, energy and agricultural commodities to the PRC, Europe and other global markets. Likewise, GMS and SASEC economies often trade more with external partners than with neighboring countries, limiting the development of regional value chains.
2	Non-tariff measures increasingly matter more than tariffs.	While tariffs have generally declined under regional and bilateral agreements, traders continue to face documentation requirements, SPS measures, technical standards, customs procedures, transit restrictions, and border inspections that increase trade costs. Example: Repeated weight certificate required across transit.
3	Trade facilitation offers larger gains than further tariff reductions.	Improvements in border management, customs modernization, National Single Windows, cross-border data exchange, eTIR, and coordinated border management can reduce trade costs more effectively than modest tariff reductions.
4	Prevalence of informal trade or shadow economy in some regions.	Informal and unrecorded cross-border trade remains widespread in many border areas, particularly involving agricultural products, livestock, food products, fuel, textiles, and consumer goods. (e.g. Afghanistan–Pakistan, Bangladesh–India, Nepal–India, Myanmar–Thailand)

Corridor 4a and 2: Projected Time and Cost

Based on a 40 ft container shipment on road

Segment	Distance (km)	Estimated time
Germany → Sarp (Türkiye)	3,400–3,700	5–7 days
Sarp → Tsiteli Khidi / Krasnyi Most (Georgia–Azerbaijan)	430–500	1–2 days
Azerbaijan inland to Baku/Alat port	500–600	1–2 days
Caspian Sea crossing	430–500	2–4 days (includes waiting & handling)
Kazakhstan (Aktau/Kuryk → Khorgos/Nur Zholy)	2,900–3,300	5–7 days
PRC (Khorgos → Takeshiken)	1,100–1,300	2–3 days
Mongolia (Yarant → Khovd)	300–350	0.5–1 day

Estimated total distance: about 9,100–10,250 km, including roughly 8,700–9,750 km by road and 430–500 km by Caspian ferry/sea crossing.

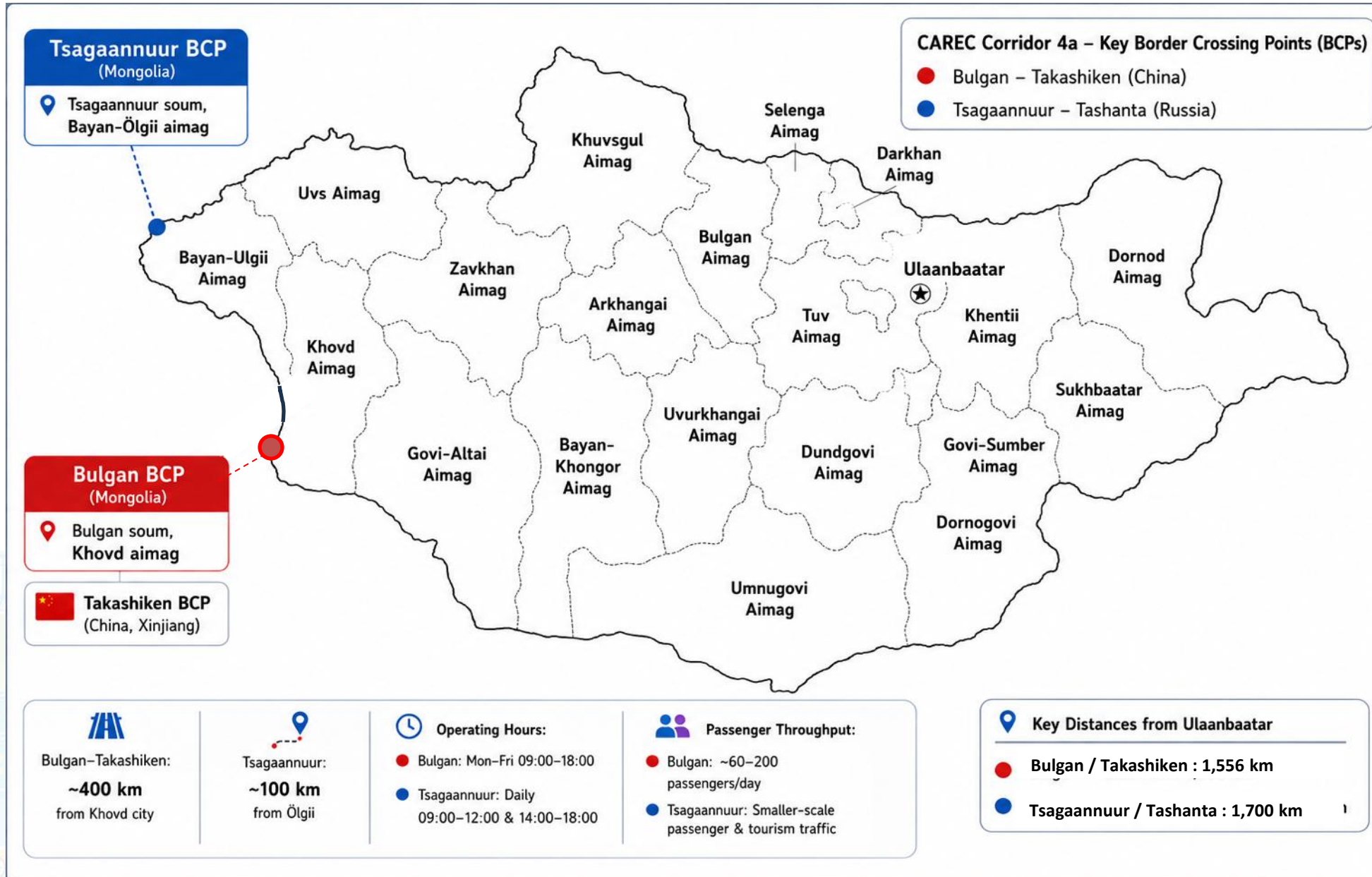
Total estimated transit time: ~16–26 days

In practice: 50–55 days!

Estimated cost is USD 15,000–24,000







Source: Consultant, Tuushin Logistics

Physical Profile of CAREC Corridor 4a









Opportunities and Risks

KEY OPPORTUNITIES

-  Create a Joint Border Market at Bulgan BCP
-  Establish Dry Ports and Bonded Warehouses
-  Build TIR Parks at Bulgan and Tsaagaannuur BCPs
-  Support E-TIR and E-CMR pilot
-  Develop Khovd as a western Mongolia logistics hub
-  Expand transit potential (e.g. Russia-Mongolia-China)

KEY RISKS

-  Limited Mongolian exports (food, coal, cashmere)
-  Extreme winter conditions
-  Waiting time at Mongolian BCP (Takashiken – Bulgan)
-  Only roads available; no rail networks
-  Relatively high cost of road shipments
-  Low population in the surrounding areas