Azerbaijan

Rail Sector Profile

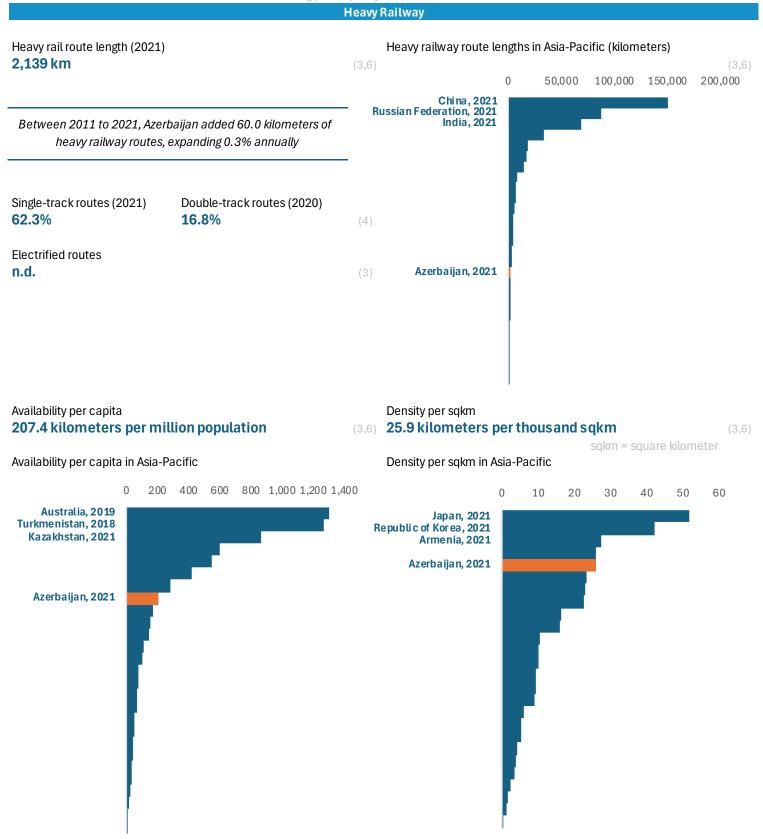
Population (2023) **10.4 Million**

Gross domestic product (GDP), PPP (2022)

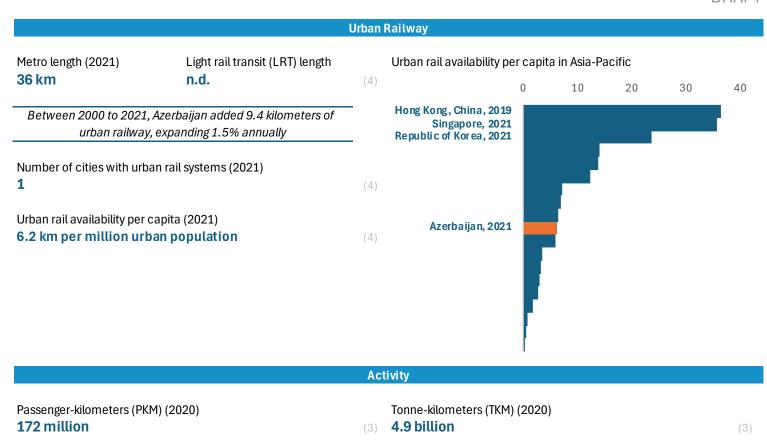
180.8 Billion USD

(1,2)

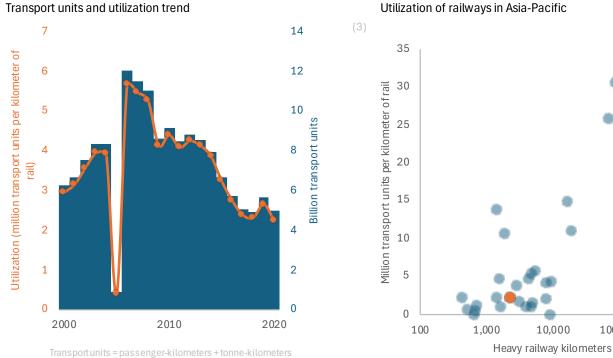
PPP = Purchasing power parity



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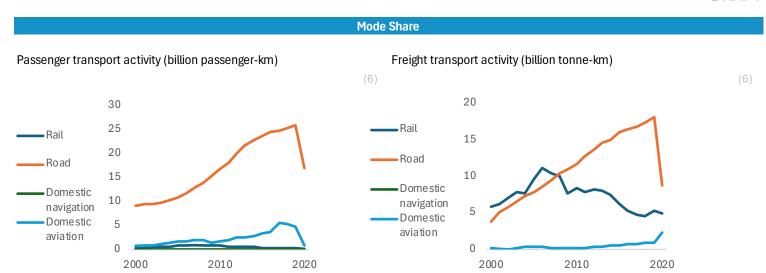


Between 2000 to 2020, PKM decreased annually by -5.1%. Between 2000 to 2020, TKM decreased annually by -0.9%

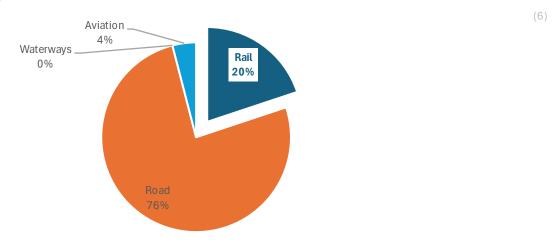


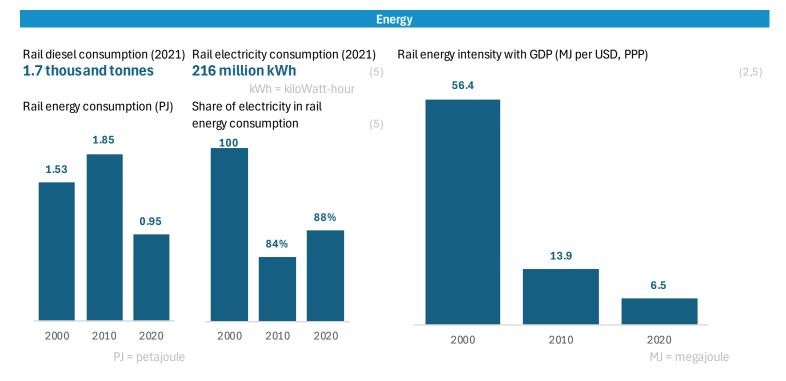
100,000 1,000,000

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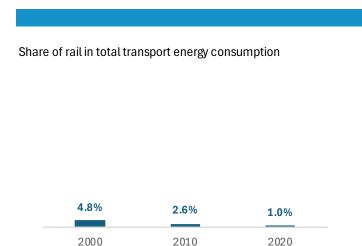


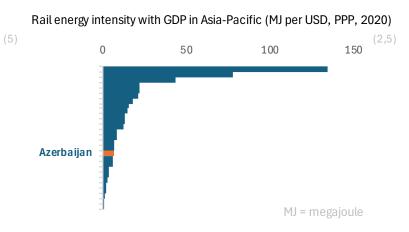
Freight transport mode share (2018)

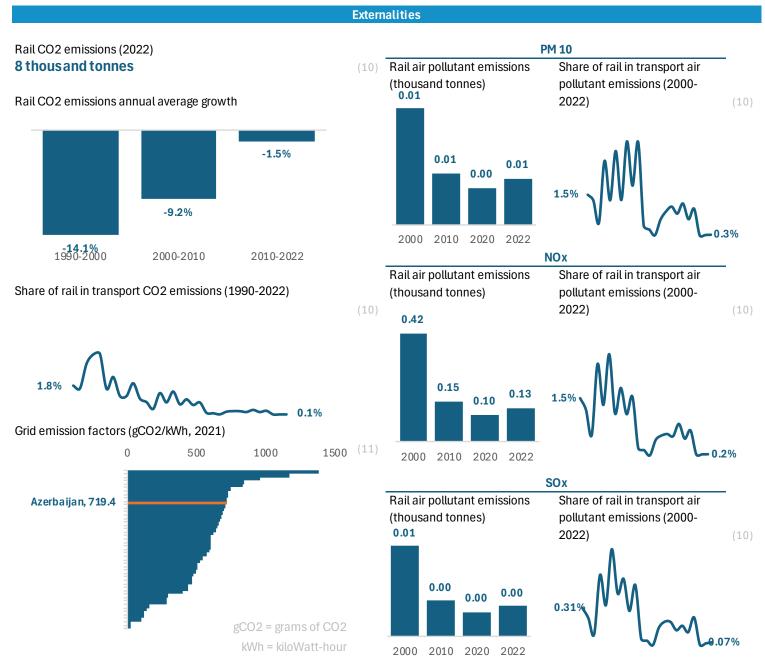




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Energy

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Public-private partnership (PPP) investments in rail (Million USD)

Official development assistance (ODA) in rail (Million USD)



Share of rail in transport PPP

| Between 2000-2015 n.d.

| Between 2016-2022

n.d.

Share of rail in transport ODA

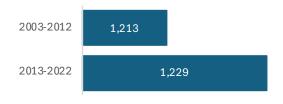
| Between 2002-2015

| Between 2016-2021

0%

77%

Import value (Million USD)



National investment in rail - capital expenditure (2000-2021)

(20) 80 mln. USD

Includes locomotives, railcars, passenger coaches, freight wagons, rail fixtures, rolling stock parts, and containers

Digitalisation

(8)

Internet speed (2022)

| Broadband 25 Mbps

| Mobile 41 Mbps

Mbps = Megabits per second

Digital readiness index (2021)

0.1/2.5

Others

Share of transport in gross value added (GVA) (2022)

8.0%

Quality of railway infrastructure (2017)

4.7/7

Percent of firms identifying transportation as a major

constraint - services (2015)

15.3%

Average annual losses to rail infrastructure due to all potential

(12) hazards (2023)

0.25 mln. USD

(13) Share of rail infrastructure in multihazard average annual loss to transport infrastructure (2023)

3.5%

(14) Efficiency of train services (2019)

5.2/7

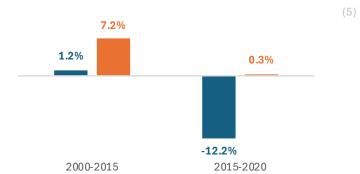
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Benchmarking Rail and Road Sectors

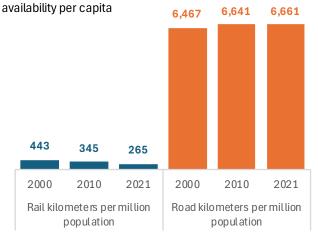
Infrastructure annual average growth of rail (including HSR, LRT, and metro) vs. road



Rail vs. road energy consumption annual average growth rate



Rail (including HSR, LRT, and metro) vs. road infrastructure $\,$



Rail vs. road CO2 emissions annual average growth rate



Sources

- (1) UN Population Database (2022), https://population.un.org/wpp/
- (2) World Bank (2022), https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD
- (3) International Union of Railways (2021), https://uic-stats.uic.org/
- (4) Rapid Transit Database (ITDP, 2022), https://www.itdp.org/rapid-transit-database/
- (5) UN Energy Statistics (2021), https://unstats.un.org/unsd/energystats/dataPortal/
- (6) Country Official Statistics
- (7) Rail Company
- (8) OOKLA (2023), https://worldpopulationreview.com/countries/internet-speeds-by-country/
- (9) CISCO (2022), https://www.cisco.com/c/en/us/about/csr/researchresources/digital-readiness.html
- (10) Emissions Database for Global Atmospheric Research (EC, 2023), https://edgar.jrc.ec.europa.eu/
- (11) Ember (2023), https://ember-climate.org/data-catalogue/yearly-electricity-data/
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http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

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https://datacatalog.worldbank.org/dataset/enterprise-surveys

(15) Koks, et al. (2019), https://www.nature.com/articles/s41467-019-10442-3

(16) World Economic Forum (2019),

 $https://www3.we forum.org/docs/WEF_The Global Competitiveness Report 2019.pdf$

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 $(18) Organis\, at ion for Economic\, Co-operation\, and\, Development\, (OECD)\, (2022),$

https://stats.oecd.org/Index.aspx?DataSetCode=CRS1#

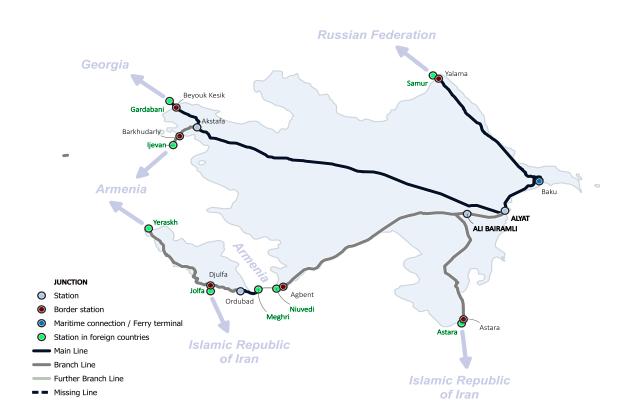
(19) Country Data

(20) Trademap (ITC, 2024), https://www.trademap.org/

 $\label{localinf} \mbox{(21) Global Infrastructure Risk Model and Resilience Index (CDRI, 2023), $$ https://giri.unepgrid.ch/$

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Azerbaijan Rail Network



Border Crossings to/from Azerbaijan

Source: UNESCAP

Country	Border Crossing	
najian - Coordia	Rayouk Kasik-Gardak	

Azerbaijan - Georgia Azerbaijan - Russian Federation Azerbaijan - Iran (Islamic Republic of) Azerbaijan - Iran (Islamic Republic of) Azerbaijan - Armenia Azerbaijan - Armenia Azerbaijan - Armenia Beyouk Kesik-Gardabani Jalama-Samur Astara-Astara Djulfa-Jolfa Barkhudarly-Ijevan Belidag-Ordubad-Yeraskh Agbent-Niuvedi

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Trans-Asian Railway Lines in Azerbaijan

Source: UNESCAP

Line	Length (km)
Yalama – Beyouk Kesik	701
Alyat – Astara	243
Ali-Bairamli – Djulfa	391
Akstafa – Bakhudarli	30

Total distance 1,365 km

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Policy Measures and Targets

Year	Rail-related measures
1999	
2018	
2022	General rail improvement
2016	General rail improvement
2023	Urban passenger rail infrastructure improvement, General public transport, Railway electrification
2021	Urban passenger rail infrastructure improvement, General rail improvement, Railway electrification
2010	General rail improvement, Railway electrification
2003	
2006	Rail infrastructure expansion
2012	Urban passenger rail infrastructure improvement, Logistics hub
2017	Urban passenger rail infrastructure improvement, Railway electrification
2001	
	1999 2018 2022 2016 2023 2021 2010 2003 2006 2012 2017

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Policy Measures and Targets

Policy document	Target year	Rail-related targets
Azerbaijan First Nationally Determined Contributions	2030	35% reduction at total emissions level compared to the base year. Total emissions reduction for 2030 compared to the base year: 25.666 Gg CO2 equivalent (excluding LULUCF) 24.374 Gg CO2 equivalent (including LULUCF)



Policy measures and targets were extracted from policy documents as listed in the ATO National Transport Policies Database https://bit.ly/ATOpolicyrepository

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Policy Insights

Infrastructure:

Azerbaijan boasts a substantial, heavy rail infrastructure, spanning 2,139 kilometers, with 207.4 kilometers per million people in 2021. Most of these routes are single-track (62%), while 17% are double-track. The country has seen a modest expansion of its heavy rail network, adding 60 kilometers between 2011 and 2021. In terms of land area, Azerbaijan has 25.9 kilometers of heavy rail per thousand square kilometers.

The urban railway system is relatively limited, with only one city featuring rapid urban transit. However, 36 kilometers of rapid urban transit lines consist entirely of MRT (Mass Rapid Transit) and no LRT (Light Rail Transit). Between 2000 and 2021, Azerbaijan added 9.4 kilometers of urban railway, achieving 6.2 kilometers of rapid urban transit per million urban population by 2021.

Activity:

In 2020, Azerbaijan's railways transported 172 million passenger-kilometers (PKM) and 4.9 billion tonne-kilometers (TKM). However, both PKM and TKM have experienced declines between 2000 and 2020, with annual decreases of 5.1% and 0.9%, respectively. Rail utilization, measured as transport units (PKM+TKM) per kilometer of heavy rail, has also decreased from 4.4 million in 2010 to 2.2 million in 2020.

The rail sector's energy consumption has declined from 1.9 PJ in 2010 to 1.0 PJ in 2020. Electricity remains the primary energy source, accounting for 88% of rail energy consumption in 2020. Despite these figures, the rail sector only consumes about 1.0% of the total energy used in the transport sector.

Emissions:

In 2020, Azerbaijan's rail sector emitted 8000 tonnes of CO2, a relatively small contribution (0.1%) to total transport fossil CO2 emissions. The sector's CO2 emissions experienced a significant decline from -9% per annum between 2000-2010 to -1.5% between 2010-2022. This improvement is partly due to the increasing use of electricity and the declining grid emission factor.

Investments:

Azerbaijan has not seen significant public-private partnership (PPP) investments in the rail sector between 2000-2022. However, the sector has received substantial official development assistance (ODA), totaling 247 million USD between 2016-2021, representing 77% of total transport ODA during that period.

Imports:

Azerbaijan's rolling stock and rail fixtures imports have remained relatively stable, with approximately 1.2 billion USD imported between 2003-2012 and 2013-2022.

Digitalization:

Azerbaijan's digital readiness is relatively low, with a score of 0.1 out of 2.5 on the CISCO digital readiness index. However, the country has decent broadband and mobile internet speeds, with 25 Mbps and 41 Mbps, respectively.

Quality and Efficiency:

The World Economic Forum's 2017 assessment rated Azerbaijan's railway infrastructure quality at 4.7 out of 7, with the efficiency of train services scoring 5.2 out of 7 in 2019.

Adaptation and Resilience:

Azerbaijan's rail infrastructure faces an estimated 0.2 million USD in annual losses due to climate hazards, representing 4% of the average annual losses to the entire transport infrastructure.

Policy:

Azerbaijan has several key policy documents guiding the rail sector, including the Transport Sector Development Strategy, Presidential orders, and socio-economic development strategies. These documents outline measures for rail infrastructure expansion, urban passenger rail improvement, general rail enhancements, public transport development, railway electrification, and the establishment of logistics hubs.

NDC Gaps and Alignment:

Policy Insights

Azerbaijan's Nationally Determined Contributions (NDCs) target a 35% reduction in total emissions by 2030 compared to the base year. While the policy documents outline measures for rail improvement, there seems to be a misalignment between the NDCs and specific targets for emission reduction in the rail sector.

Priorities and Opportunities:

To achieve climate targets and boost the rail sector's sustainability, Azerbaijan could focus on electrifying railways, enhancing energy efficiency, and incorporating renewable energy sources into rail operations. Furthermore, it could explore strategies to increase rail usage and shift freight transportation from road to rail to reduce overall emissions. Developing integrated transportation hubs and logistics centers that enable smooth transitions between rail and other modes of transport, such as ports, airports, and road networks, can help optimize the efficiency of the entire transportation system. Lastly, exploring green financing mechanisms to fund sustainable rail projects could be crucial.

By addressing these priorities and leveraging existing policy frameworks, Azerbaijan can create a more sustainable and resilient railway system that contributes to the country's climate goals and economic development.

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