Uzbekistan

Rail Sector Profile

Population (2023)
35.2 Million

Gross domestic product (GDP), PPP (2022)
339.8 Billion USD (1,2)

PPP = Purchasing power parity

Heavy Railway

Heavy rail route length (2017)
4,642 km (3,6)

Between 2000 to 2017, Uzbekistan added 997.0 kilometers of heavy railway routes, expanding 1.4% annually

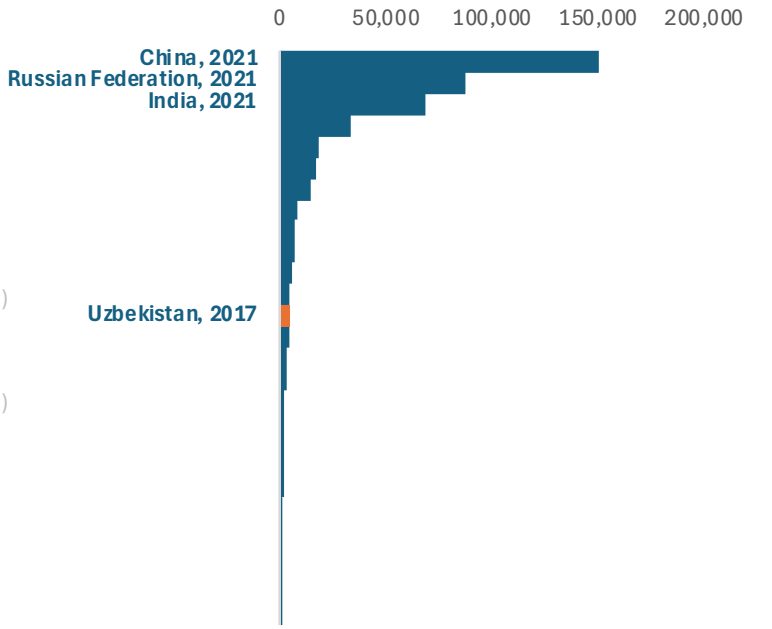
Single-track routes (2020)
38.7%

Double-track routes (2020)
60.4% (4)

Electrified routes
n.d. (3)

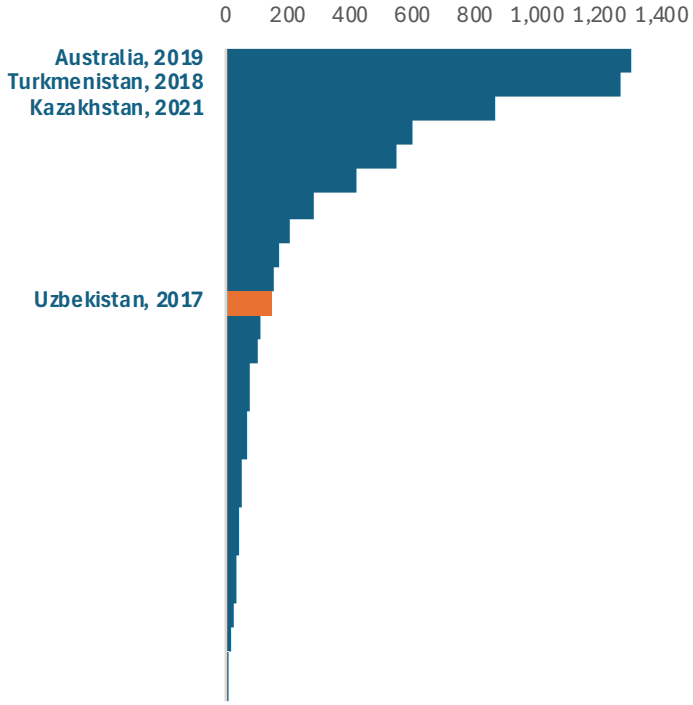
Between 2000 to 2021, Uzbekistan added 1312.9 kilometers of electrified routes, expanding 6.2% annually

Heavy railway route lengths in Asia-Pacific (kilometers) (3,6)



Availability per capita
145.3 kilometers per million population (3,6)

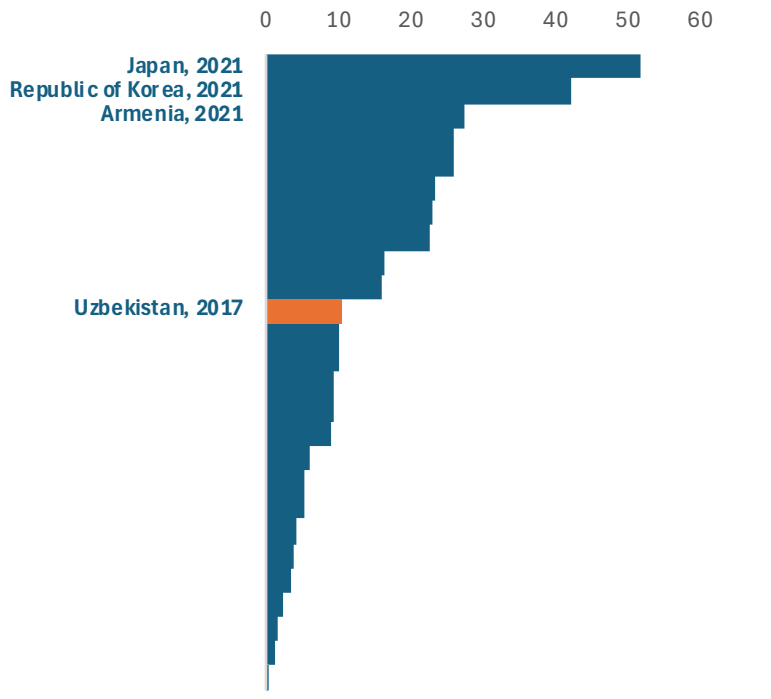
Availability per capita in Asia-Pacific



Density per sqkm
10.5 kilometers per thousand sqkm (3,6)

sqkm = square kilometer

Density per sqkm in Asia-Pacific



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Urban Railway

Metro length (2020)
50 km

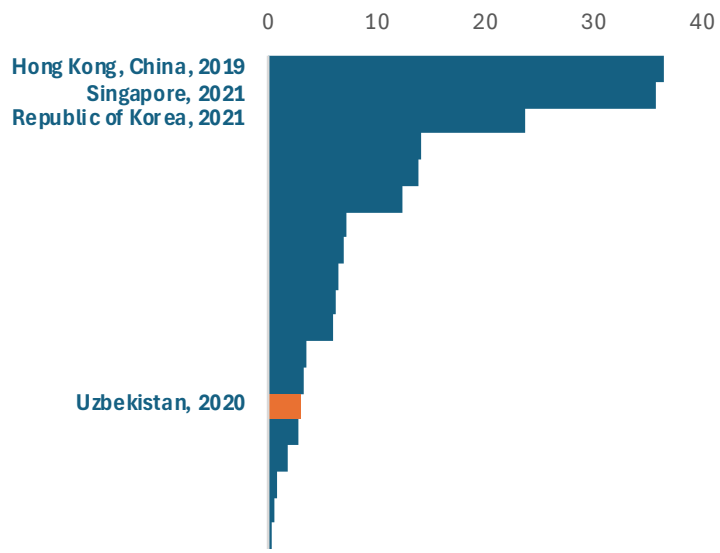
Light rail transit (LRT) length
n.d. (4)

Between 2000 to 2020, Uzbekistan added 20.3 kilometers of urban railway, expanding 2.6% annually

Number of cities with urban rail systems (2021)
1 (4)

Urban rail availability per capita (2020)
3.0 km per million urban population (4)

Urban rail availability per capita in Asia-Pacific



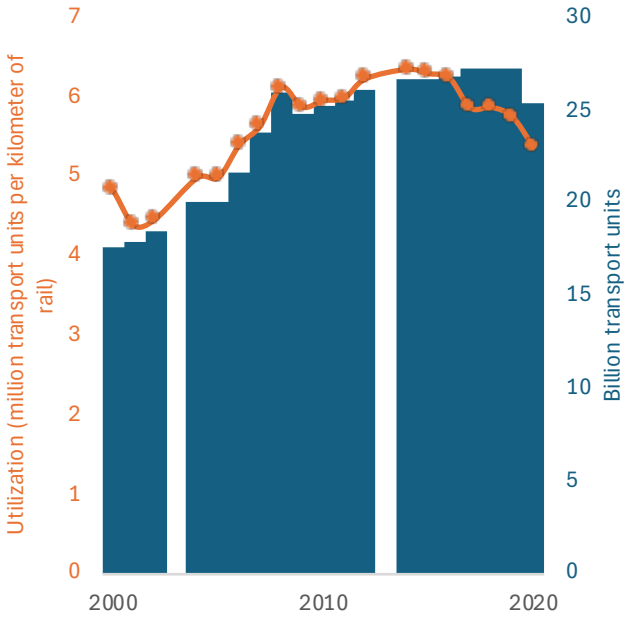
Activity

Passenger-kilometers (PKM) (2020)
1.8 billion (3)

Tonne-kilometers (TKM) (2020)
23.6 billion (3)

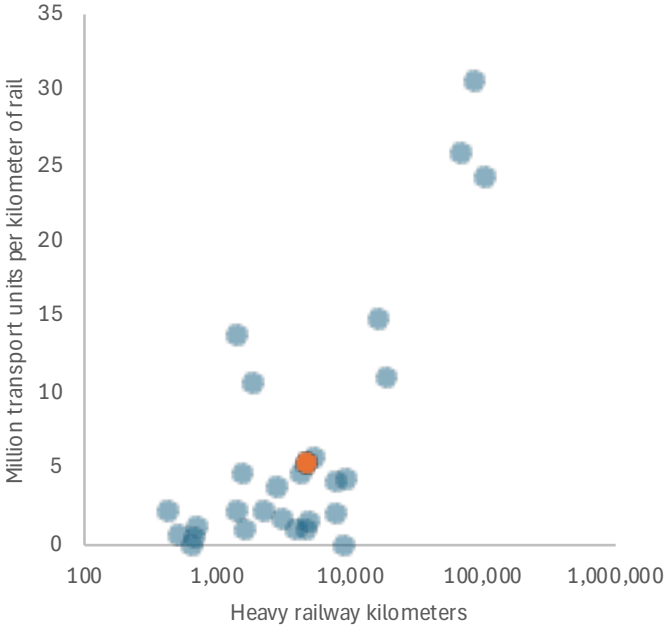
Between 2000 to 2020, PKM decreased annually by -0.9%. Between 2000 to 2020, TKM increased annually by 2.2%

Transport units and utilization trend (3)



Transport units = passenger-kilometers + tonne-kilometers

Utilization of railways in Asia-Pacific (3)



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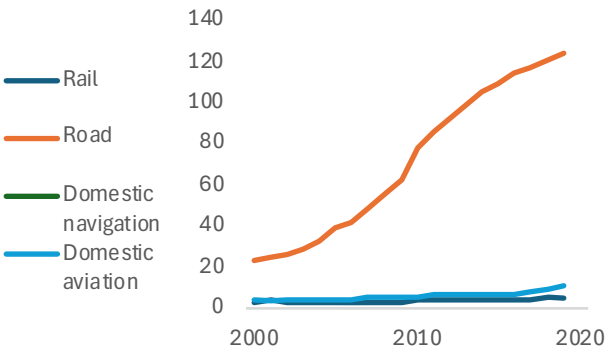
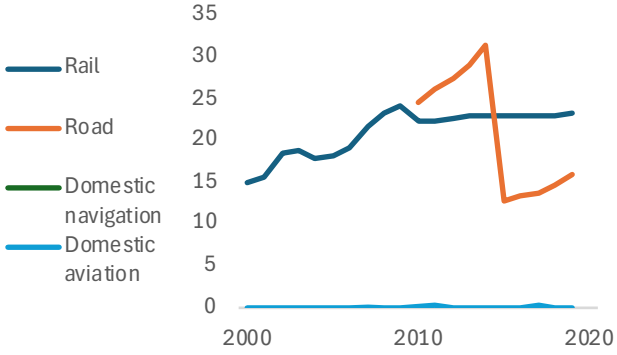
Mode Share

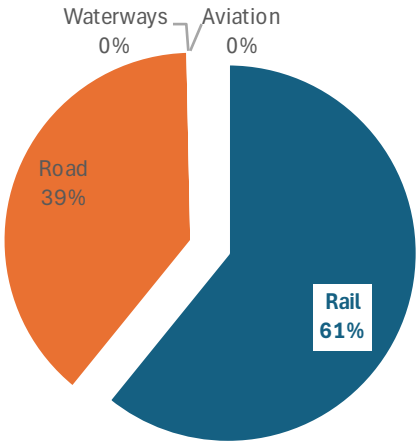
Passenger transport activity (billion passenger-km) (6)



Freight transport activity (billion tonne-km) (6)



Freight transport mode share (2018) (6)



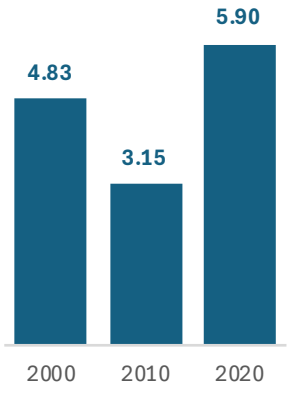
Energy

Rail diesel consumption (2020)
81.28 thousand tonnes (5)

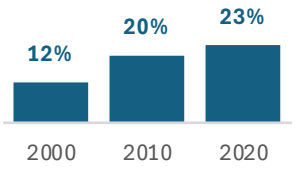
Rail electricity consumption (2020)
371.731 million kWh (5)

kWh = kiloWatt-hour

Rail energy consumption (PJ)

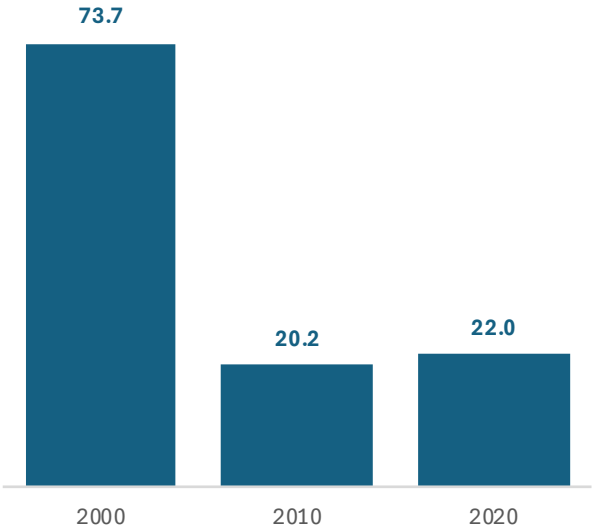


Share of electricity in rail energy consumption (5)



PJ = petajoule

Rail energy intensity with GDP (MJ per USD, PPP) (2,5)



MJ = megajoule

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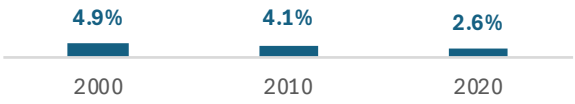
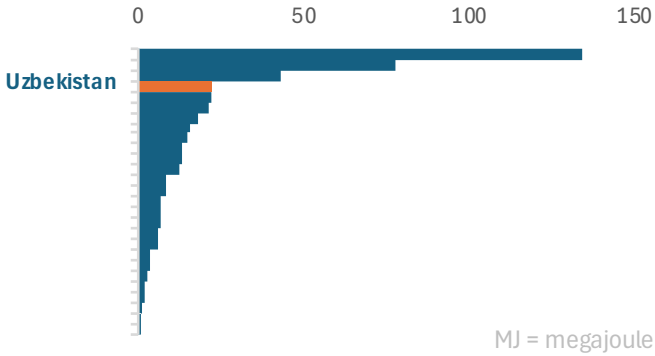
Energy

Share of rail in total transport energy consumption (5)



Rail energy intensity with GDP in Asia-Pacific (MJ per USD, PPP, 2020) (2,5)



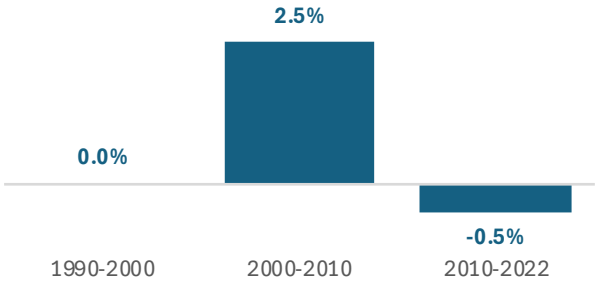
MJ = megajoule

Externalities

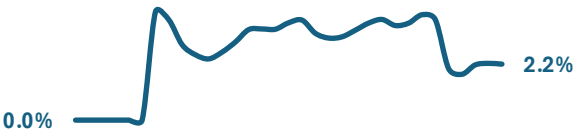
Rail CO2 emissions (2022)

402 thousand tonnes (10)

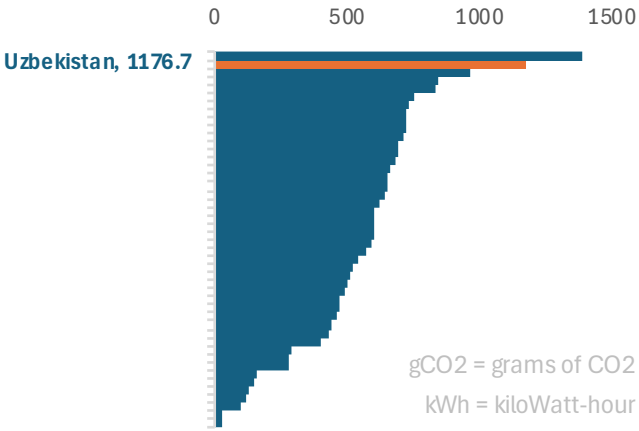
Rail CO2 emissions annual average growth



Share of rail in transport CO2 emissions (1990-2022) (10)



Grid emission factors (gCO2/kWh, 2021) (11)

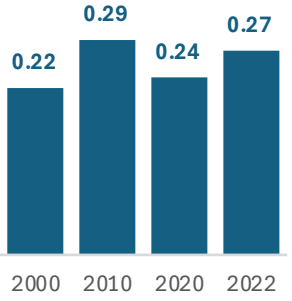


gCO2 = grams of CO2

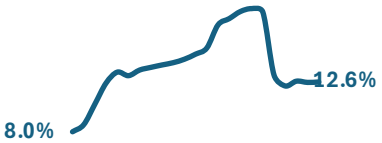
kWh = kiloWatt-hour

PM 10

Rail air pollutant emissions (thousand tonnes)

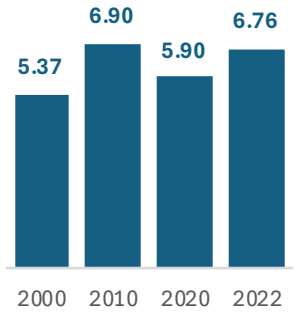


Share of rail in transport air pollutant emissions (2000-2022) (10)

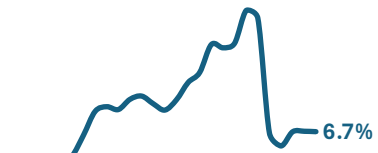


NOx

Rail air pollutant emissions (thousand tonnes)

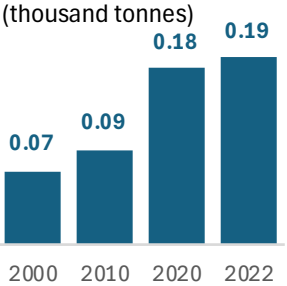


Share of rail in transport air pollutant emissions (2000-2022) (10)

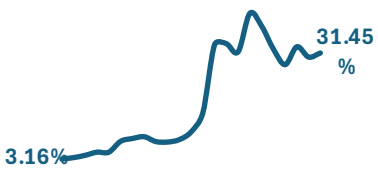


SOx

Rail air pollutant emissions (thousand tonnes)



Share of rail in transport air pollutant emissions (2000-2022) (10)



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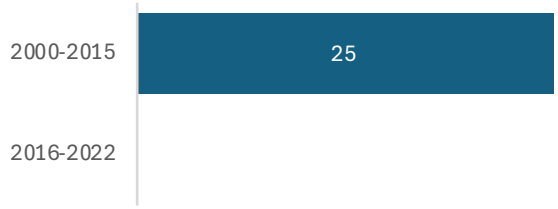
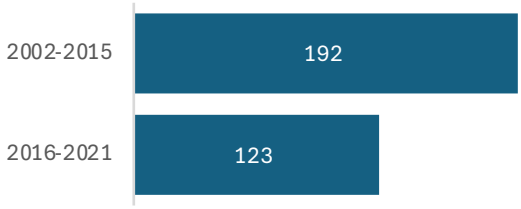
Investment

Public-private partnership (PPP) investments in rail (Million USD) (17)



Official development assistance (ODA) in rail (Million USD) (18)



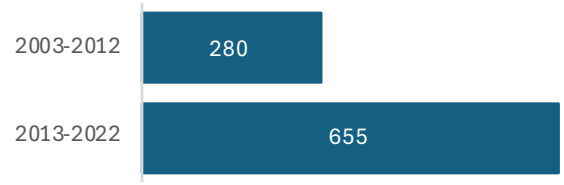
Share of rail in transport PPP (17)

Between 2000-2015	Between 2016-2022
100%	**n.d.**

Share of rail in transport ODA (18)

Between 2002-2015	Between 2016-2021
53%	**43%**

Import value (Million USD) (20)



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

National investment in rail - capital expenditure (0) (19)

n.d.

Digitalisation

Internet speed (2022) (8)

Broadband	Mobile
46 Mbps	**19 Mbps**

Mbps = Megabits per second

Digital readiness index (2021) (9)

-0.1/2.5

Others

Share of transport in gross value added (GVA) (2022) (12)

7.0%

Quality of railway infrastructure (2017) (13)

n.d.

Percent of firms identifying transportation as a major constraint - services (2015) (14)

15.3%

Average annual losses to rail infrastructure due to all potential hazards (2023) (21)

2.23 mln. USD

Share of rail infrastructure in multihazard average annual loss to transport infrastructure (2023) (21)

26.5%

Efficiency of train services (2019) (16)

n.d.

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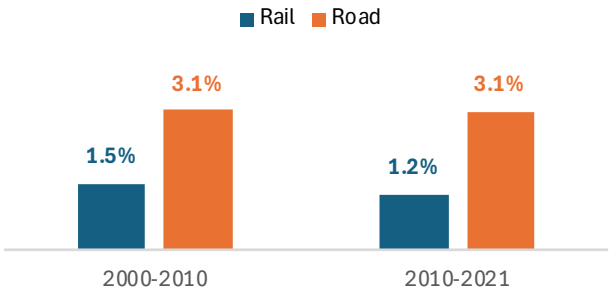
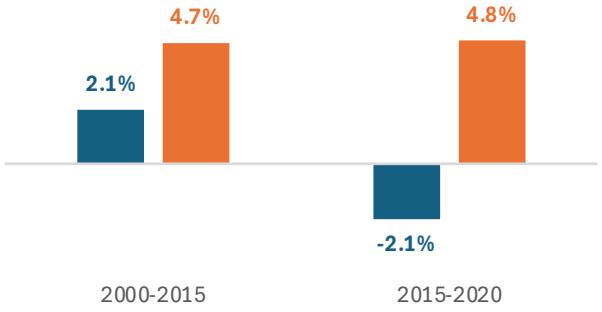
Benchmarking Rail and Road Sectors

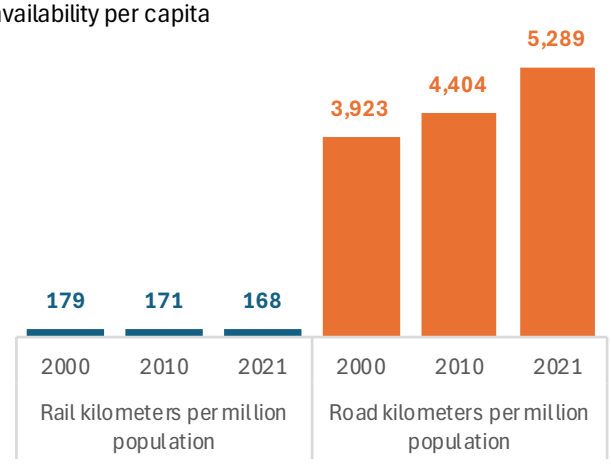
Infrastructure annual average growth of rail (including HSR, LRT, and metro) vs. road (3,6)



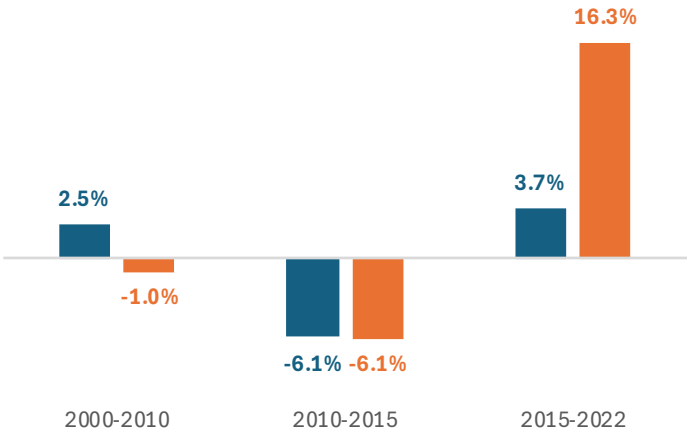
Rail vs. road energy consumption annual average growth rate (5)



Rail (including HSR, LRT, and metro) vs. road infrastructure availability per capita (3,6)



Rail vs. road CO2 emissions annual average growth rate (10)



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/research-resources/digital-readiness.html

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

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(17) PPI Database (World Bank, 2023), https://ppi.worldbank.org/en/ppi

(18) Organisation 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/

(21) Global Infrastructure Risk Model and Resilience Index (CDRI, 2023), https://giri.unepgrid.ch/

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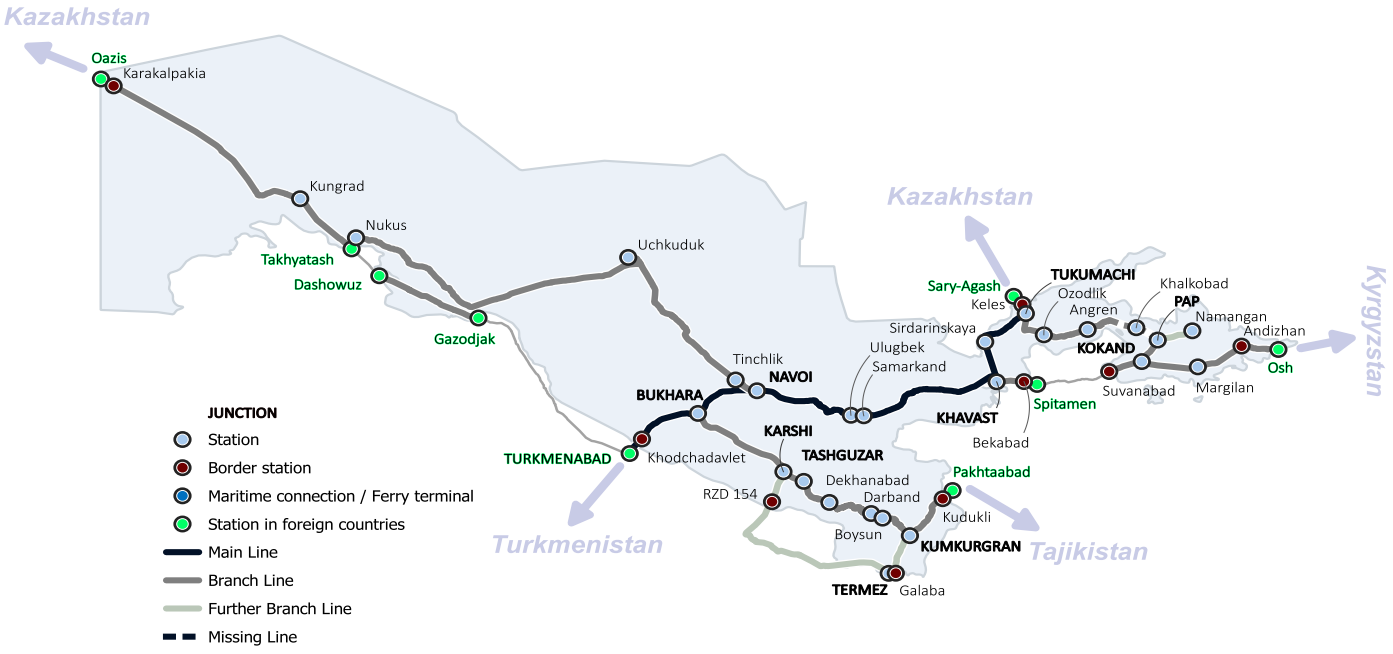
Uzbekistan Rail Network



Border Crossings to/from Uzbekistan

Source: UNESCAP

Country	Border Crossing
Uzbekistan - Turkmenistan	Khodzhadavlet-Turkmenabad
Uzbekistan - Afganistan	Galaba-Khairaton
Uzbekistan - Kyrgyzstan	Andizhan-Osh
Uzbekistan - Turkmenistan	RZD 154-Talimarjan
Uzbekistan - Turkmenistan	Termez-Kelif
Uzbekistan - Kazakhstan	Keles-Sary-Agach
Uzbekistan - Kazakhstan	Karakalpakia-Oazis
Uzbekistan - Tajikistan	Bekabad-Nau
Uzbekistan - Tajikistan	Suvanabad-Kanibadam
Uzbekistan - Tajikistan	Kudukli-Pakhtaabad
Uzbekistan - Tajikistan	Amuzang-Khoshad
Uzbekistan - Turkmenistan	Pitnyak - K.P.449-Gazodjak
Uzbekistan - Turkmenistan	Urgench-Dashowuz
Uzbekistan - Turkmenistan	Naymankhul-Takhyatash

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Trans-Asian Railway Lines in Uzbekistan

Source: UNESCAP

Line	Length (km)
Keles – Khodchadavlet	707
Tukumachi – Kokand	163
Khavast – Border with Kyrgyzstan	400
Navoi – Border with Kyrgyzstan	1,168
Bukhara – Border with Tajikistan	513
Andizhan – Namangan	423
Karshi – Galaba	337
Termez – Border with Tajikistan	73
Ozodlik – Pap (missing link)	191
Total distance	3,974 km

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Policy Measures and Targets

Policy document	Year	Rail-related measures
Updated Nationally Determined Contribution	2021	
Draft Strategy for the Development of the Transport System of the Republic of Uzbekistan until 2035	2019	Rail infrastructure expansion, Urban passenger rail infrastructure improvement, High-speed rail (HSR), General rail improvement, General public transport, Railway electrification, Renewable energy, Intermodality measures, Reduction of transport/ logistics costs, General transport target - Transport activity, Logistics hub
First Biennial Update Report of the Republic of Uzbekistan	2021	Railway electrification, General transport target - Transport GHG emission
Third National Communication of the Republic of Uzbekistan under the UN Framework Convention On Climate change	2016	Rail infrastructure expansion, Railway electrification
Voluntary National Review 2023	2023	General public transport, Railway electrification, General transport target - Transport activity
Development Strategy of New Uzbekistan for 2022-2026	2022	Non-urban passenger rail infrastructure improvement, General public transport, Railway electrification, General transport target - Transport activity
On measures to improve transport infrastructure and diversify foreign trade routes for the transportation of goods for 2018 - 2022	2017	Rail infrastructure expansion, General rail improvement, Railway electrification, Intermodality measures, Logistics hub
Strategy on the Transition of the Republic of Uzbekistan to a "Green" Economy 2019-2030	2019	General public transport

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Policy Measures and Targets

Policy document	Target year	Rail-related targets
Updated Nationally Determined Contribution	2030	ensure transition of 80% (about 6,500) of public transport units to gas fuel and electric traction
Voluntary National Review 2023	2026	The targets have been defined to increase the electrification level of railway infrastructure to 60%
Updated Nationally Determined Contribution	2030	ensure transition of 80% (about 6,500) of public transport units to gas fuel and electric traction
First Biennial Update Report of the Republic of Uzbekistan	2030	The concept of environmental protection until 2030 contains measures to: a) transfer 80% of public transport to gas fuel and electric traction
Draft Strategy for the Development of the Transport System of the Republic of Uzbekistan until 2035	2035	develop a program of measures for the introduction of transport interchange systems, primarily through the introduction of a model of transport interchange nodes in large, large and major cities of the country (14 units by 2035);
Draft Strategy for the Development of the Transport System of the Republic of Uzbekistan until 2035	2035	Reducing the level of specific transportation costs in the price of products by 2035 according to the basic option - from 15 percent in 2018 to 10% in 2035, according to the innovative option - up to 7 percent.
First Biennial Update Report of the Republic of Uzbekistan	2025	reduction of CO2 emissions per 1 reduced t-km by automobile transport- by 2025 by 5%, by 2035 by 10%, by railway transport- by 2025 by 15%, by 2035 by 24%,
First Biennial Update Report of the Republic of Uzbekistan	2025	reduction of CO2 emissions per 1 reduced t-km by automobile transport- by 2025 by 5%, by 2035 by 10%, by railway transport- by 2025 by 15%, by 2035 by 24%,
Voluntary National Review 2023	2026	increase the transit cargo turnover to 15 million tons.
Development Strategy of New Uzbekistan for 2022-2026	2026	Expansion of "green corridors" and transit opportunities in the transport system for foreign trade, as well as an increase in the volume of transit cargo turnover up to 15 million tons.

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

The Current Landscape

Uzbekistan's railway network, vital to the nation's transportation, spans 4,642 kilometers. While heavy rail dominates, the urban rail network is limited, with only 50 kilometers of rapid transit in Tashkent. The rail sector has seen mixed activity, with passenger kilometers decreasing and tonne-kilometers increasing. Energy consumption has risen, with electricity now representing 23% of total energy use. The sector's CO2 emissions have declined, contributing only 2.2% to total transport emissions.

Key Points:

CO2 Emissions: Although the rail sector's CO2 emissions are relatively low at 2.2%, there's potential for further reduction. The increasing grid emission factor between 2010 and 2021 underscores the need for cleaner energy sources.
Energy Consumption: The growth in the rail sector's energy consumption, with electricity making up 23%, highlights the importance of energy efficiency and electrification.
Infrastructure: Uzbekistan has progressed in expanding its heavy rail network, but the urban railway infrastructure requires development, with only 50 kilometers of rapid transit.

Climate Change Impacts and Adaptation

Uzbekistan's rail infrastructure faces an estimated annual loss of 2.2 million USD due to climate hazards, representing 27% of average annual losses to the entire transport sector. This underscores the vulnerability of the rail network to climate change impacts. Adaptation and resilience measures are critical to ensure the continued operation and safety of the railway system in the face of increasing climate risks.

Policy Landscape and NDC Alignment

Uzbekistan has developed several policy documents addressing the rail sector and climate change. The "Draft Strategy for the Development of the Transport System of the Republic of Uzbekistan until 2035" and the "Updated Nationally Determined Contribution (NDC)" outline key targets and measures. However, gaps remain in fully aligning NDCs with policy priorities and opportunities. The NDC's target of transitioning 80% of public transport to gas fuel and electric traction by 2030 is ambitious but faces challenges in implementation and financing.

Policy Priorities and Opportunities

Uzbekistan has opportunities to enhance the climate resilience of its rail network and reduce its carbon footprint. Key priorities include:
•Expanding electrification: Increasing the electrification of the rail network will reduce reliance on fossil fuels and decrease greenhouse gas emissions. The target of 60% electrification by 2030 is a positive step, but further investments and policy support are needed.
•Promoting intermodality: Encouraging the seamless transfer of goods and passengers between different modes of transport, such as rail and road, can optimize transport efficiency and reduce emissions. Developing transport interchange nodes in major cities is crucial for achieving this.
•Investing in renewable energy: Expanding the use of renewable energy sources in the rail sector can further decarbonize operations and contribute to national climate goals.
•Enhancing adaptation and resilience: Implementing measures to protect rail infrastructure from climate hazards, such as extreme weather events and temperature changes, is essential for ensuring the long-term viability of the network.

Conclusion

Uzbekistan's railway sector faces both challenges and opportunities in the context of climate change. While progress has been made in reducing emissions and improving energy efficiency, further efforts are needed to achieve full alignment with NDC targets and enhance the climate resilience of the rail network. By prioritizing electrification, intermodality, renewable energy, and adaptation measures, Uzbekistan can build a sustainable and resilient railway system that supports its development goals and contributes to global climate action.

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