Sri Lanka

Rail Sector Profile

Population (2023)
21.9 Million

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

PPP = Purchasing power parity

Heavy Railway

Heavy rail route length (2021)
1,607 km (3,6)

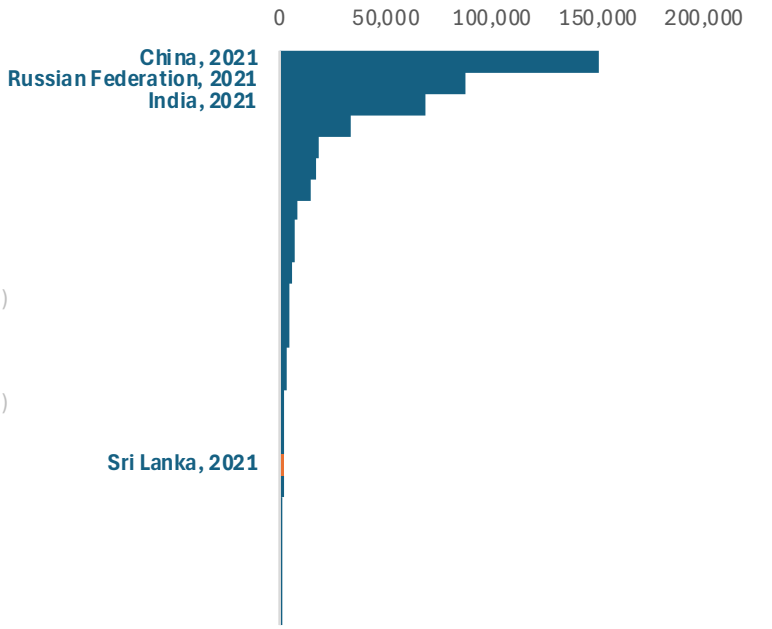
Between 2008 to 2021, Sri Lanka added 344.0 kilometers of heavy railway routes, expanding 1.9% annually

Single-track routes
n.d.

Double-track routes (2019)
34.7% (4)

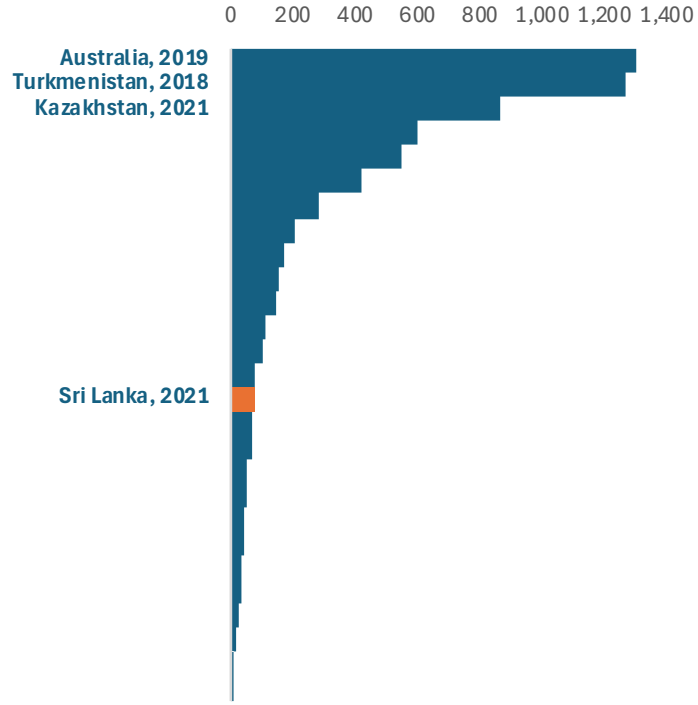
Electrified routes
n.d. (3)

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



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

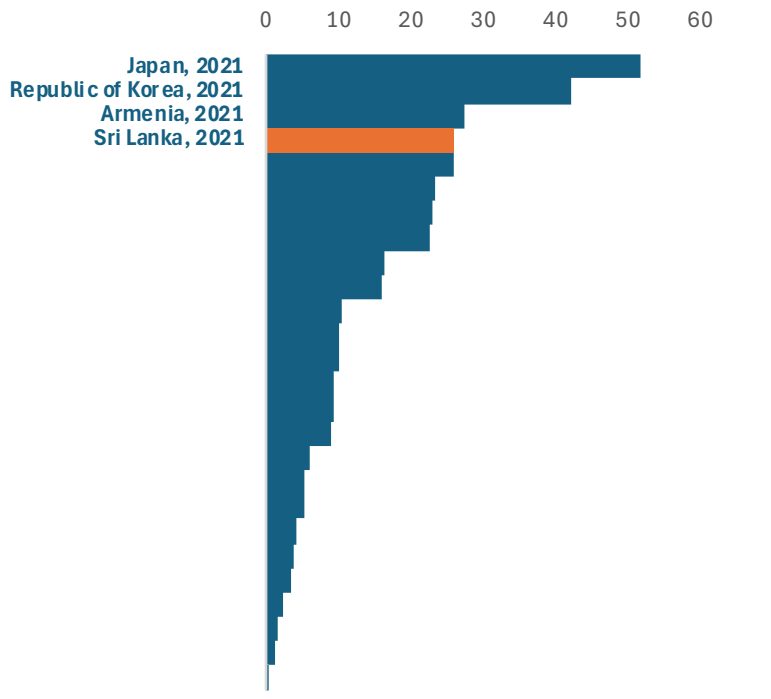
Availability per capita in Asia-Pacific



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

sqkm = square kilometer

Density per sqkm in Asia-Pacific



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Urban Railway

Metro length (2021)
n.d.

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

Urban rail availability per capita in Asia-Pacific

Number of cities with urban rail systems (2021)
0 (4)

Urban rail availability per capita (2021)
n.d. (4)

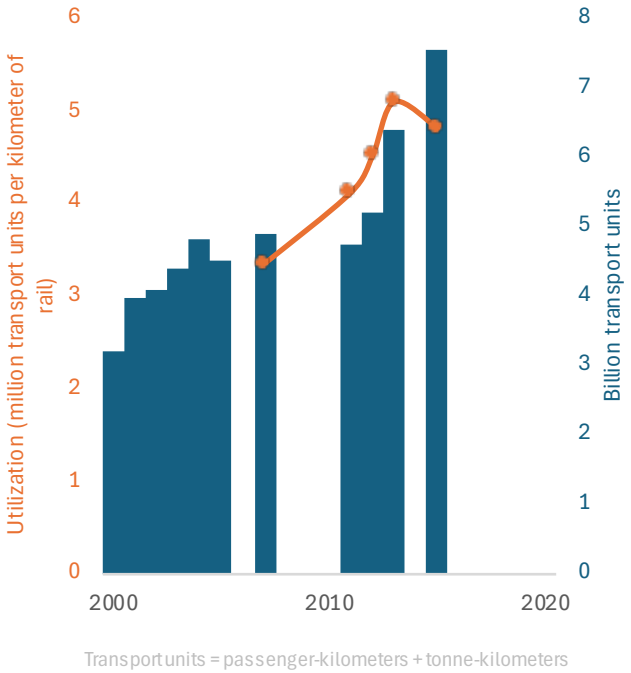
Activity

Passenger-kilometers (PKM) (2015)
7.4 billion (3)

Tonne-kilometers (TKM) (2015)
127 million (3)

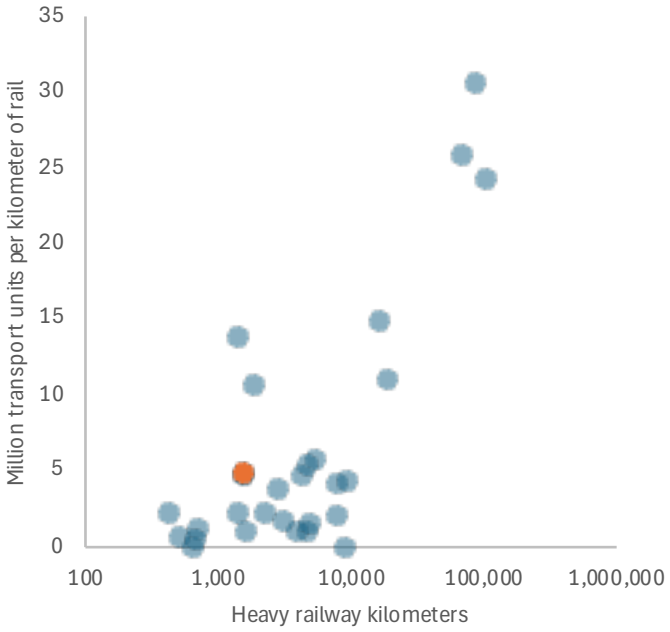
Between 2000 to 2015, PKM increased annually by 5.7%. Between 2003 to 2015, TKM increased annually by 0.1%

Transport units and utilization trend (3)



Transport units = passenger-kilometers + tonne-kilometers

Utilization of railways in Asia-Pacific (3)



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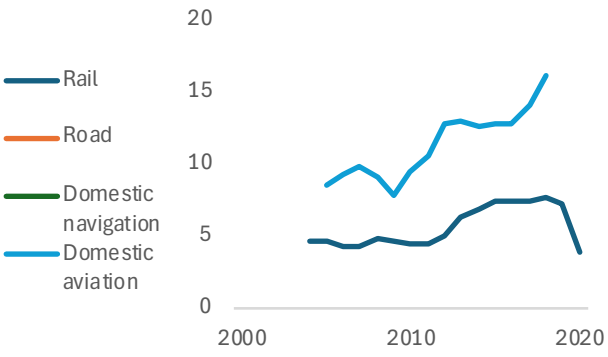
Mode Share

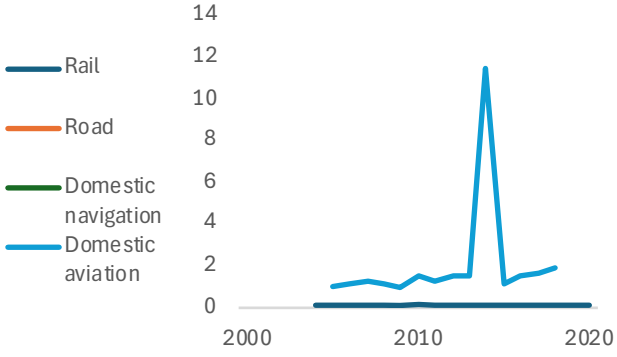
Passenger transport activity (billion passenger-km)

(6)



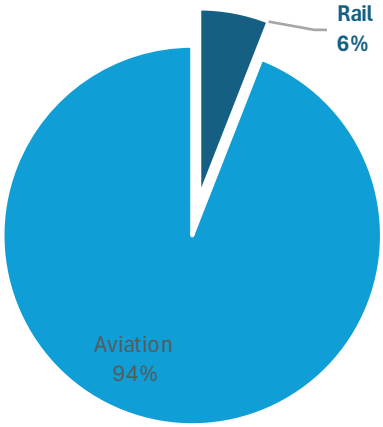
Freight transport activity (billion tonne-km)

(6)



Freight transport mode share (2018)

(6)



Energy

Rail diesel consumption (2020)

25.806 thousand tonnes

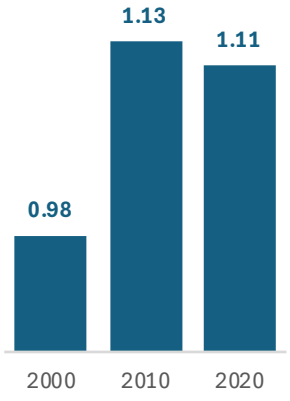
Rail electricity consumption (2021)

n.d.

(5)

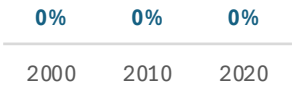
kWh = kiloWatt-hour

Rail energy consumption (PJ)



Share of electricity in rail energy consumption

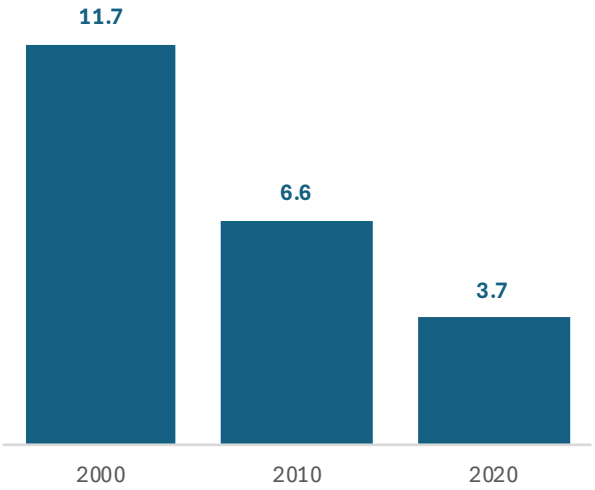
(5)



PJ = petajoule

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

(2,5)



MJ = megajoule

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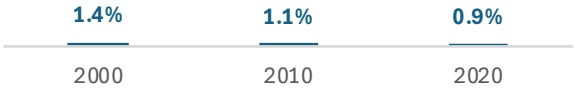
Energy

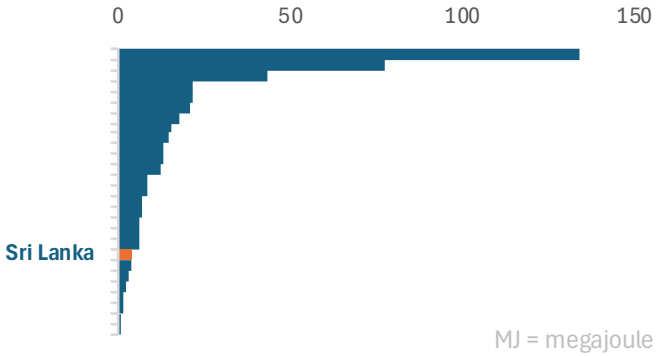
Share of rail in total transport energy consumption

(5)



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

(2,5)



MJ = megajoule

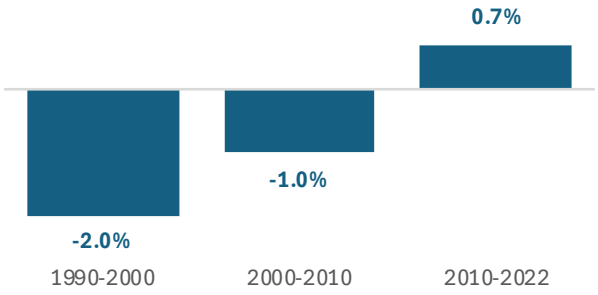
Externalities

Rail CO2 emissions (2022)

67 thousand tonnes

(10)

Rail CO2 emissions annual average growth

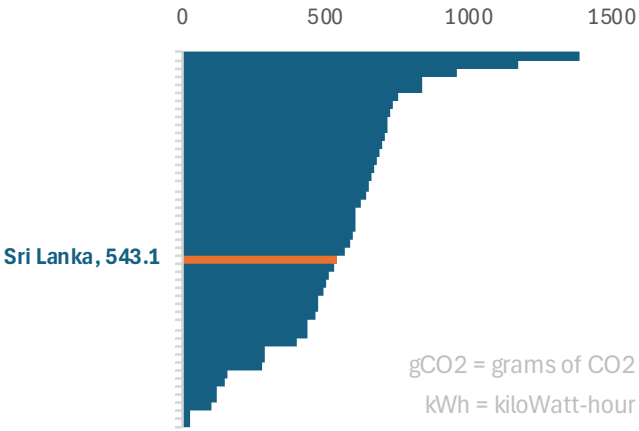


Share of rail in transport CO2 emissions (1990-2022)

(10)

Grid emission factors (gCO2/kWh, 2021)

(11)

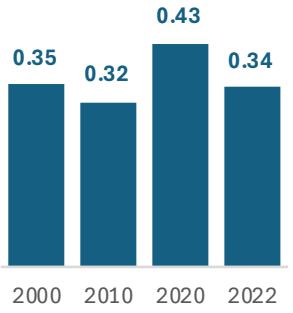


gCO2 = grams of CO2

kWh = kiloWatt-hour

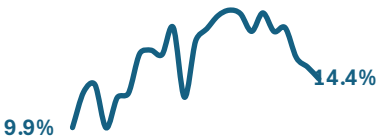
PM 10

Rail air pollutant emissions (thousand tonnes)



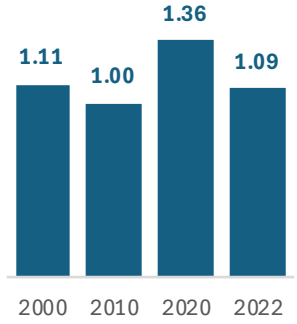
Share of rail in transport air pollutant emissions (2000-2022)

(10)



NOx

Rail air pollutant emissions (thousand tonnes)

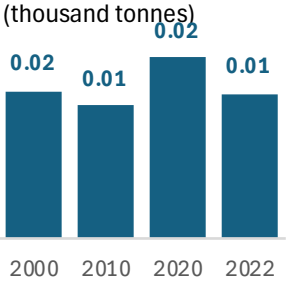


Share of rail in transport air pollutant emissions (2000-2022)

(10)

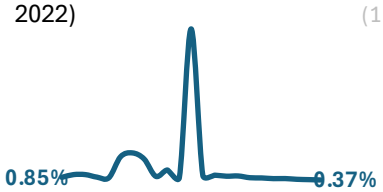
SOx

Rail air pollutant emissions (thousand tonnes)



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

(10)



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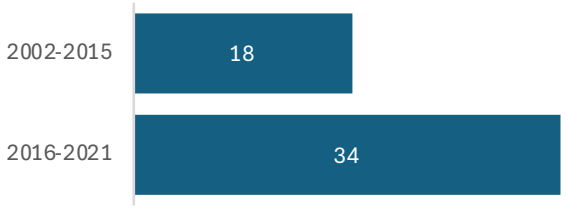
Investment

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

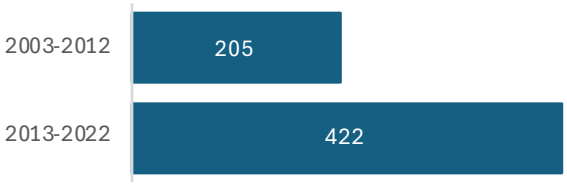
Official development assistance (ODA) in rail (Million USD) (18)



Share of rail in transport PPP
| Between 2000-2015 **n.d.**
| Between 2016-2022 **n.d.** (17)

Share of rail in transport ODA
| Between 2002-2015 **1%**
| Between 2016-2021 **4%** (18)

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)
n.d. (19)

Digitalisation

Internet speed (2022)
| Broadband **26 Mbps**
| Mobile **17 Mbps** (8)

Mbps = Megabits per second

Digital readiness index (2021)
-0.3/2.5 (9)

Others

Share of transport in gross value added (GVA) (2022)
13.7% (12)

Quality of railway infrastructure (2017)
3.2/7 (13)

Percent of firms identifying transportation as a major constraint - services (2015)
15.3% (14)

Average annual losses to rail infrastructure due to all potential hazards (2023)
8.33 mln. USD (21)

Share of rail infrastructure in multihazard average annual loss to transport infrastructure (2023)
34.6% (21)

Efficiency of train services (2019)
3.8/7 (16)

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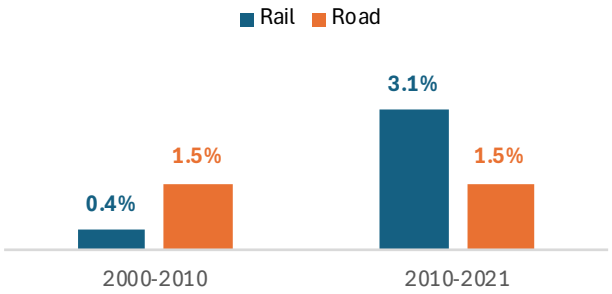
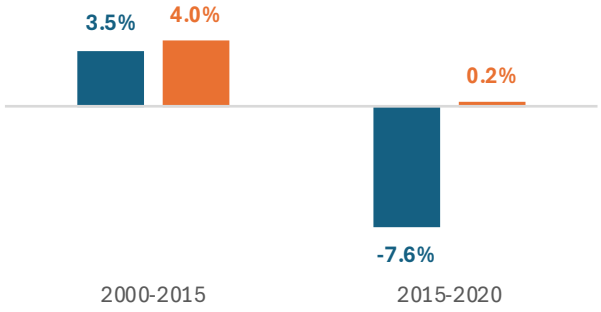
Benchmarking Rail and Road Sectors

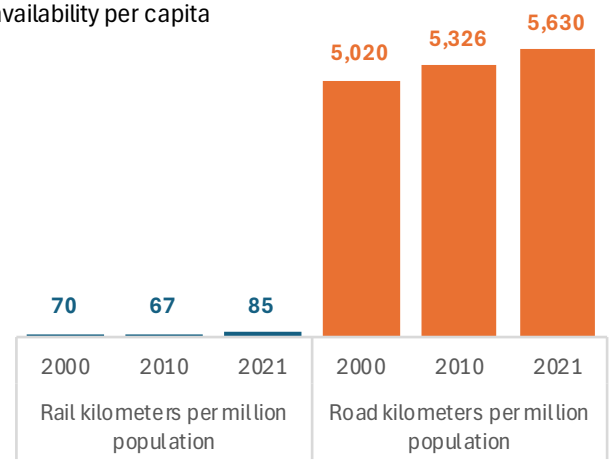
Infrastructure annual average growth of rail (including HSR, LRT, and metro) vs. road (3,6)



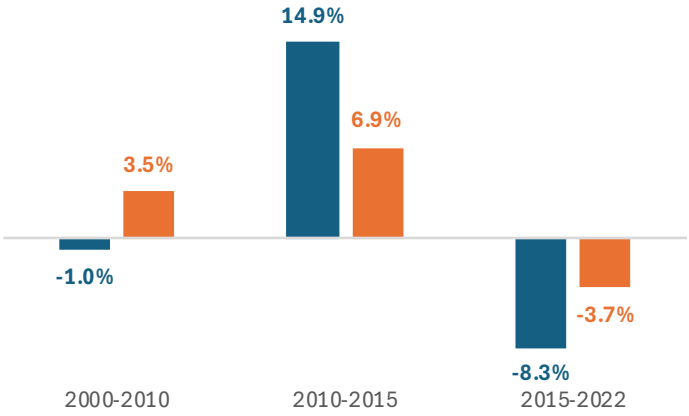
Rail vs. road energy consumption annual average growth rate (5)



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/
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(7) Rail Company
(8) OOKLA (2023), https://worldpopulationreview.com/countries/internet-speeds-by-country/
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(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/
(12) UN Statistics (2022), https://unstats.un.org/unsd/snaama/Downloads
(13) World Economic Forum (2019), http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf
(14) World Bank (2020), 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.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf
(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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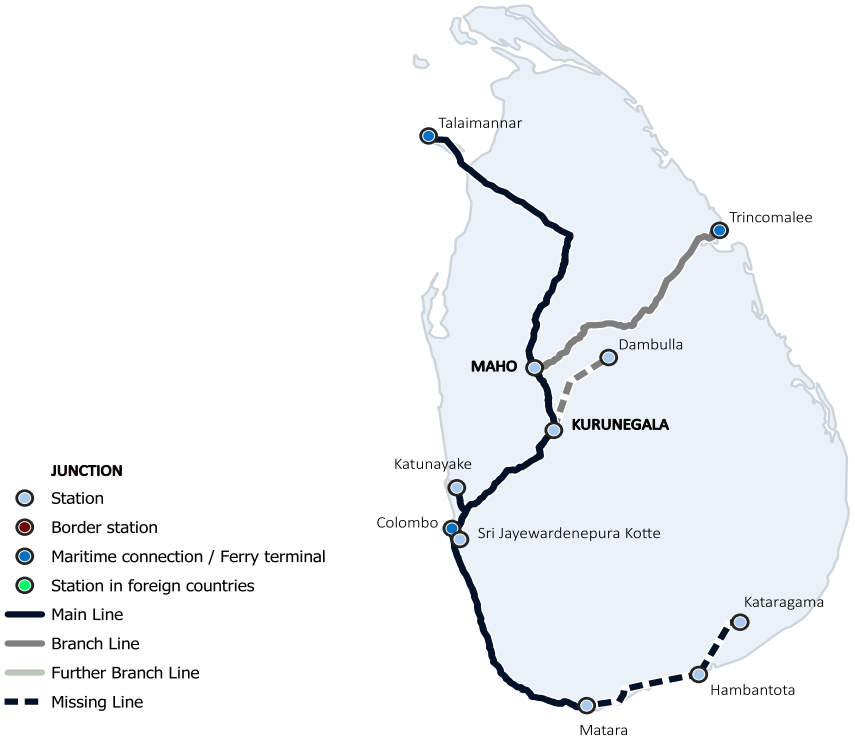
Sri Lanka Rail Network



Border Crossings to/from Sri Lanka

Source: UNESCAP

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Trans-Asian Railway Lines in Sri Lanka

Source: UNESCAP

Line	Length (km)
Colombo – Katunayake	49
Colombo – Talaimannar	354
Maho – Trincomalee	160
Talaimannar – Border with India	52
Kataragama – Colombo (missing link)	280
Kurunegala – Dambulla (missing link)	57
Total distance	952 km

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Policy Measures and Targets

Policy document	Year	Rail-related measures
Convention on the Rights of Persons with Disabilities 2006	2006	
National Action Plan for Haritha Lanka Programme	2009	Urban passenger rail infrastructure improvement, General rail improvement, Logistics hub
National transport Policy of Sri Lanka	2017	Transport infrastructure resilience, Renewable energy
Climate Prosperity Plan	2022	Railway electrification, Renewable energy
First Nationally Determined Contributions	2016	General rail improvement, Railway electrification, Transport infrastructure resilience
Updated Nationally Determined Contributions	2021	Rail infrastructure expansion, Urban passenger rail infrastructure improvement, General rail improvement, Railway electrification, Freight transport shifting to rail or inland waterways (IWT), Intermodality measures
Public Investment Program 2021	2017	Rail infrastructure expansion, Urban passenger rail infrastructure improvement, Railway electrification, Transport infrastructure resilience
Sustainable Sri Lanka 2030 Vision and Strategic Path	2019	Urban passenger rail infrastructure improvement, General rail improvement, Railway electrification, Transport infrastructure resilience, Renewable energy, Intermodality measures, Logistics hub
National Physical Planning Policy & The Plan — 2017-2050	2019	Rail infrastructure expansion, High-speed rail (HSR), General rail improvement, Railway electrification
National Adaptation Plan for Climate change Impacts in Sri Lanka	2016	Transport infrastructure resilience
The National Export Strategy (NES) of Sri Lanka	2018	General public transport, Development of rail plan/ policy, Intermodality measures, Logistics hub
National Civil Aviation Policy for Sri Lanka	2016	Intermodality measures
Clean Air 2025 - Action plan for Air Quality Management	2016	Urban passenger rail infrastructure improvement, General rail improvement, Freight transport shifting to rail or inland waterways (IWT)

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Policy Measures and Targets

Policy document	Target year	Rail-related targets
Climate Prosperity Plan	2030	50% of public transportation, including suburban railway, is electrified including through retrofitting.
Climate Prosperity Plan	2035	100% of public transportation, including suburban railway, is electrified including through retrofitting.
National Physical Planning Policy & The Plan — 2017-2050	2030	this electrified railway is proposed to be extended up to Kurunegala before 2030
Sustainable Sri Lanka 2030 Vision and Strategic Path	2030	achieving at least 50 per cent use of renewable energy for transport by 2030
First Nationally Determined Contributions	2030	NDCs for Mitigation intends to reduce the GHG emissions against BAU scenario by 20% in the energy sector (4% unconditionally and 16% conditionally) and by 10% in other sectors (transport, industry, forests and waste) by 3% unconditionally and 7% conditionally by 2030.
Updated Nationally Determined Contributions	2030	reduce greenhouse emissions by 14.5% for the period of 2021-2030 from Power (electricity generation), Transport, Industry, Waste, Forestry, and Agriculture

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 and Activity

Sri Lanka's heavy rail network, spanning 1,607 kilometers, serves as a vital artery for transport. While there's been growth in infrastructure, the absence of rapid urban transit systems in cities highlights an area for potential development. The heavy rail infrastructure expanded by 344 kilometers between 2008 and 2021, but the country lacked rapid urban transit systems. In 2015, Sri Lanka's railways transported 7.4 billion passenger-kilometers and 127 million tonne-kilometers. Passenger and freight activity has seen mixed trends, with passenger kilometers increasing but freight transport showing slower growth.

Energy and Emissions

The rail sector's energy consumption reached 1.1 PJ in 2020, with electricity accounting for 0% of this total. Sri Lanka's rail sector emitted 67 thousand tonnes of CO2 in 2020, a small fraction of total transport emissions. While CO2 emissions grew at 0.7% annually between 2010 and 2022, the rail sector contributes minimally to PM10, NOx, and SOx emissions. Rail emissions constitute a minor fraction of the total transport emissions, reflecting its inherent environmental advantage.

Investments and Challenges

Sri Lanka's imports of rolling stock and rail fixtures increased significantly, from $205 million between 2003 and 2012 to approximately $422 million between 2013 and 2022. However, Investment in the rail sector, both through public-private partnerships and official development assistance, remains relatively low compared to the broader transport sector. The sector attracted limited public-private partnership investments and received 34 million USD in official development assistance between 2016 and 2021. This underscores the need for increased financial flows to support modernization and expansion efforts.
Due to the impact of climate change, Sri Lanka's rail infrastructure is projected to suffer approximately 8.3 million USD in annual losses. This represents a significant portion, about 35%, of the average yearly losses experienced by the entire transport infrastructure sector.

Policy Framework and NDC Gaps

Key policy documents, including the Sustainable Sri Lanka 2030 Vision and Nationally Determined Contributions (NDCs), outline rail infrastructure expansion, electrification, and resilience measures. However, there are gaps in NDC alignment with policies and implementation. The Climate Prosperity Plan targets 100% electrification of public transport, including suburban rail, while the First NDCs aim for a 20% reduction in GHG emissions in the energy sector and 10% in other sectors by 2030. The Updated NDCs seek to reduce greenhouse emissions by 14.5% across various sectors between 2021 and 2030. However, there's a need for greater alignment between the NDCs and specific rail policies to ensure effective implementation.

Opportunities and Priorities

Several opportunities exist to strengthen the rail sector's resilience and contribution to climate goals. Electrification of the network, expansion of urban rail systems, and promotion of freight transport on rail can significantly reduce emissions. Investing in climate-resilient infrastructure and enhancing digital capabilities are also crucial steps. Current policies prioritise

- Expanding rail infrastructure
- Improving urban passenger rail infrastructure
- Developing high-speed rail (HSR)
- Implementing general rail improvements
- Promoting general public transport
- Electrifying railways
- Enhancing transport infrastructure resilience
- Developing comprehensive rail plans and policies
- Shifting freight transport to rail or inland waterways (IWT)
- Utilizing renewable energy
- Implementing intermodality measures
- Establishing logistics hubs

Sri Lanka's rail sector faces challenges in infrastructure development, electrification, and climate resilience. To bridge NDC gaps and achieve policy goals, the country should prioritize:

Policy Insights

•Expanding and modernizing rail infrastructure, particularly in urban areas, to enhance connectivity and accessibility
•Accelerating railway electrification to reduce reliance on fossil fuels and decrease CO2 emissions
•Strengthening climate resilience of rail infrastructure to mitigate the impact of climate hazards
•Promoting intermodality to facilitate seamless transfers between rail and other modes of transport
•Enhancing digitalization to improve operational efficiency and passenger experience
•Increasing investments in the rail sector, including public-private partnerships and official development assistance

Conclusion

Sri Lanka's rail sector stands at a crossroads, facing the challenges of climate change and the need for modernization. By prioritizing sustainable investments, aligning policies with climate goals, and leveraging technological advancements, Sri Lanka can ensure a resilient, low-carbon rail network that contributes to a greener and more prosperous future.

This rail sector profile was developed by the Asian Transport Outlook (ATO) with the contribution by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), which provided information on the Trans-Asian Railway Network routes. The ATO is an initiative developed under TA-6763 REG: Accelerating Innovation in Transport - Asian Transport Outlook: Phase 3 (55119-001) of the Asian Development Bank (ADB) and is also being supported by the Asian Infrastructure Investment Bank (AIIB) through Purchase Order No. CW39446 AIIB Support: Asian Transport Outlook Phase 3.