A. Sector Performance, Problems, and Opportunities

1. **Country context.** Sri Lanka benefits from an advantageous geographical position at the crossroads of major maritime trade routes between Asia and Europe. It is densely populated with about 346 people per square kilometer (km²), a land area of about 62,710 km², and a population of 21.7 million in 2018 that has increased at an annual rate of about 0.8% from 19.9 million in 2007.\(^1\) About 55% of Sri Lanka’s urban population is concentrated in Colombo, the country’s commercial and administrative center. The district of Colombo is one of the three districts in the Western Province, which has a population of 6.1 million—28% of the country total—and contributes 39% of Sri Lanka’s gross domestic product (GDP).\(^2\)

2. **Economic performance.** After a strong post-war recovery period, with annual GDP growth averaging 8.5% during 2009–2012, GDP growth moderated to 4.1% during 2012–2018, and is forecast to continue at 4.1% in 2019.\(^3\) With a GDP per capita of $4,065 in 2017, Sri Lanka is on the path to achieving upper middle-income status. The poverty headcount ratio decreased from 22.7% of the population in 2002 to 4.1% in 2016. Industry accounts for 29.6% of the GDP and services account for 62.2%. However, inadequate transport infrastructure and services delivery hinder the development of industry and services, and prevent Sri Lanka from leveraging its geographical position to increase its competitiveness and promote inclusive economic growth. During 2007–2017, total exports increased by only 2.7% while imports grew by 7.3%. The decreasing efficiency of the railway and public transport networks particularly impacts the Western Province and suburban Colombo, as commuters and freight exporters resort to road-based modes.

3. **Travel demand.** Sri Lanka’s population is projected to stabilize to 25 million by 2050.\(^4\) Coupled with strong economic growth resulting in the rising affluence of the middle class, the country faces a rapid increase in motorization rates and congestion. The number of registered vehicles in Sri Lanka increased by 8.8% per year from 3.1 million in 2007 to 7.2 million in 2017. About 67% of new cars and 33% of all new vehicles were registered in the Western Province, where daily motorized trips are forecast to rise from 7.9 million trips in 2013 to 18.3 million by 2035. Roads cover only about 10.7% of the urban area of Colombo.\(^5\) Significant investments are thus needed to alleviate the growing pressure on the road network, mitigate the negative economic impacts of congestion, heighten the railway market share, and increase domestic trade.

4. **Transport networks.** Colombo is the central node of the road, rail, air, and port infrastructure networks. Established in 1858, Sri Lanka Railways (SLR) owns and operates the railway network, and is administratively set up as a department of the Ministry of Transport & Civil Aviation. The network consists of 1,568 kilometers (km) of tracks, 91% of which are single track on a 1,676-millimeter broad gauge, connecting 179 major and 164 minor stations. The network has a radial structure centered on Colombo, and the 230 km of tracks (15% of the network) in the Western Province carry more than 80% of SLR’s passengers. Road is the predominant mode of transport, carrying about 93% of passenger traffic and 97% of freight traffic. The dense nationwide road network includes about 12,369 km of national roads and highways, and 104,900 km of

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\(^1\) Compared with 1,265 people per km² in Bangladesh, 450 in India, 204 in Nepal, 255 in Pakistan, and 135 in Thailand.


\(^5\) Compared with 25.7% for Paris, 25.0% for London, 21.6% for Inner Tokyo, 13.6% for Seoul, and 7.1% for Bangkok.
provincial and rural roads. International air passengers increased from 5.3 to 9.8 million passengers during 2010–2017, with Colombo international airport handling over 99% of air traffic. Short distances, high fares, and limited services restrict the potential for domestic air travel, which only attracted 60,000 passengers in 2016. The port of Colombo handled about 81.8 million tons of cargo, with Galle, Hambantota, and Trincomalee ports handling a combined total of 4.6 million tons.

5. **Operational performance.** In 2017, about 351 passenger trains and 19 freight trains operated daily, transporting 136.7 million passengers and 2.0 million tons of goods annually.\(^6\) At its peak, SLR carried over 35% of the passenger market and 80% of freight transport, but subpar maintenance and underinvestment in the modernization and expansion of the network decreased its market share to about 6% of the passenger market in suburban Colombo and to 1% of freight transport. In railway corridors, SLR’s passenger market share reaches 43%, underlining the need for stronger multimodal integration. In suburban Colombo, SLR faces slow operational speeds of less than 30 km/hour, high average delays of more than 13 minutes per train, frequent failures of the signaling and telecommunication systems, and overcrowding of trains during peak hours. Passengers experience long waiting times at ticket booths due to frequent shortages of the tickets for the 60,000 custom-printed ticket combinations.

6. **Aging infrastructure.** SLR’s infrastructure is old and outdated, resulting in high operating costs, which limits its investment capacity and hampers the economic development of Sri Lanka. Suburban signaling primarily uses a relay interlocking system installed in 1965 and an electronic interlocking system installed in 2000, while mechanical interlocking is still used on 736 km of tracks. A small centralized traffic control center that first opened in 1962 monitors railway operation in the Western Province. The radio telecommunication system was installed in 1985, but no spare parts have been received since 1998. Automation is low, and most planning, timetabling, operating, and data collection activities are still done manually.

7. **Rolling stock.** In 2016, SLR owned (i) 151 diesel locomotives, of which 65% were over 30 years old and only 105 were operational; (ii) 99 diesel multiple units, of which 25% were over 35 years old and 85 were operational; and (iii) 7 steam locomotives, of which 2 were operational. The 25 different rolling stock models require more than 16,000 different spare parts. Most of the rolling stock suffers from corrosion, notably due to airborne and water salinity along the Coastal Line, and rehabilitation opportunities are limited. A mean time between engine failures of only 17 hours severely impacts travel time and leads to frequent train cancellations due to unavailability of locomotives. The SLR also owns 683 freight wagons and 500 passenger carriages, all of which are operational. The Ratmalana workshop, which opened in 1971, conducts major rolling stock maintenance works and requires upgrading to reduce the maintenance backlog.

8. **Financial performance.** Passenger traffic dominates SLR operations and revenues, and generated revenues of about $35.7 million in 2017, or $0.004 per passenger-km.\(^7\) Non-passenger revenues amounted to $7.5 million, including $2.7 million from freight, or $0.020 per ton-km.\(^8\) In comparison, operational expenses amounted to $93.9 million in 2017, and annual capital expenditures during 2013–2017 averaged $154.3 million. Labor costs represent 65.2% of operational expenses, fuel accounted for 27.7%, and supplies and maintenance made up only 7.1%. The operating ratio of 2.17 highlights the need to increase SLR’s financial performance to improve its sustainability, notably by reducing operational losses, improving governance, and

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\(^7\) By comparison, revenues per passenger-km were $0.009 in Bangladesh and $0.006 in India.

\(^8\) By comparison, revenues per ton-km were $0.033 in Bangladesh and $0.025 in India, where freight accounts for 68.8% of revenues and subsidizes passenger railway fares.
developing alternative revenue streams by leveraging land assets. Railway fares increased by 15% in October 2018 for the first time in a decade, and the Asian Development Bank (ADB) is supporting the preparation of a tariff formula (para. 15).

9. **Staffing and skills.** The SLR workforce decreased to about 16,000 employees from 34,000 in 1960–1969, and is represented by 111 active trade unions. The Sri Lanka German Railway Technical Training Center, established in 1983 as a subdepartment of SLR, produced 83 graduating students in 2017 from its four training courses for machinists, diesel engine mechanics, electricians, and welders. While the center is well maintained, its facilities and curricula need to be upgraded to support SLR’s long-term modernization program and changing skills requirements, and to play a leading role in the development of its technical and managerial skills.

10. **Railway safety.** SLR experiences a high number of accidents resulting from poor track and rolling stock conditions, overcrowding, and the high level of encroachment in urban areas—particularly on the Coastal line and the Kelani Valley line in suburban Colombo, where more than 2,000 households live within centimeters of the tracks. There were 125 train derailments in 2017. During 2016–2017, 814 injuries and 394 deaths were recorded on the railway network, including 26 deaths at level crossings, 145 injuries and 5 deaths from people falling from trains, and 516 injuries and 180 deaths due to pedestrian collisions (including suicides). Most of the rights-of-way are unfenced, which also resulted in the deaths of 38 cattle and 12 elephants in 2017.

11. **Challenges.** The sector faces several challenges, including (i) operational inefficiencies with low average speed, frequent delays, outdated telecommunication and control center systems, and deteriorated tracks and rolling stock; (ii) insufficient maintenance, including a large maintenance backlog, poor organization, and low productivity; (iii) a poor safety record linked to the outdated infrastructure, encroachment, the large number of level crossings, and unfenced rights-of-way; (iv) inadequate workforce with low productivity, requiring significant training to modernize its business practices and facilitate the adoption of new technologies; and (v) a weak financial position, an outdated business structure, and low accountability.

B. **Government’s Sector Strategy**

12. **Government strategy.** The transport sector is guided by the National Transport Policy, 2018. The policy aims to provide efficient, inclusive, safe, and environmentally sustainable movement of people and goods to support sustainable economic development. The Public Investment Program, 2017–2020 provides specific directions for the railway subsector. By 2020, the program aims to double the share of railway passenger transport to 10% from 5% in 2015, increase the share of railway freight transport to 5% from 1%, and increase the public transport passenger share to 65% from 58%. The government intends to achieve these targets by improving railway institutions and management, harmonizing land use and infrastructure planning, promoting multimodal integration and technological innovation, and leveraging the competitive advantage of the railway in three market segments: (i) suburban passenger services in Colombo and Kandy; (ii) long-distance express services, where rail can compete with road and air transport on affordability, speed, and comfort; and (iii) redevelopment of freight transport to increase revenues, develop export capacity, and increase productivity across global value chains. The railway subsector strategy complements the urban and suburban transport strategies for

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Colombo and the Western Province, which emphasize the development of a rapid transit system network in Colombo and of multimodal transport hubs.\textsuperscript{11}

13. \textbf{Investment plan.} The investment program identifies the following key improvements for the railway subsector: (i) increasing and rehabilitating rolling stock fleet; (ii) expanding railway lines and improving track capacity; (iii) improving railway signaling; (iv) establishing railway property management; (v) enhancing railway stations, ticketing system, and information system; (vi) increasing private sector participation; and (vii) rationalizing subsidies and tariffs. Investment priorities identified by SLR also include (i) electrifying the Panadura–Veyangoda section, (ii) modernizing the Kelani Valley line, (iii) upgrading and double-tracking lines, and (v) installing protected level crossings (footnote 6). However, investment plans do not identify funding sources. In 2017, the budget allocation for capital expenditures amounted to about $123.2 million, with a budget utilization of 69.7%, of which 42% was from foreign-aided projects. As SLR incurs significant operating losses, external assistance and financial control improvements will be required to support the strategic targets and capital improvements of SLR and the government.

14. \textbf{Opportunities.} Key factors for the successful implementation of the government’s strategy include (i) improving the operational efficiency of SLR to alleviate congestion during peak hours; (ii) strengthening its financial sustainability by increasing operational revenues, developing new revenue streams, and reducing operational expenditures; (iii) mobilizing external resources to support capital improvements; (iv) coordinating with external stakeholders to ensure the multimodal integration of railways with other transport modes; and (v) supporting staff training and development to accompany the changes brought by improvements in modern technology.

C. \textbf{ADB Sector Experience and Assistance Program}

15. \textbf{ADB’s assistance.} During 1969–2017, ADB financed 515 sovereign loans, grants, and technical assistance (TA) projects in Sri Lanka for a total of $9.1 billion, including 81 transport projects for $2.7 billion, primarily in the road subsector. ADB’s involvement in the railway subsector includes (i) a TA project approved in 2015 to prepare a prefeasibility study for improving the suburban railway network of Colombo; (ii) a TA loan, approved in 2016 for $24.4 million to prepare feasibility and detailed design studies for four major suburban lines; and (iii) a TA project approved in 2017 to prepare a nationwide railway master plan, which will assess institutional strengthening needs, identify and prioritize investments, support tariff reforms, and identify the potential for private sector participation and the development of freight supply chains.\textsuperscript{12}

16. \textbf{Strategy.} ADB’s objectives in the transport sector include providing more efficient, sustainable, and integrated transport infrastructure to strengthen the drivers of economic growth and diversify economic activities; and improving rail transport and rural roads to promote inclusive growth.\textsuperscript{13} ADB’s strategy is aligned with the government’s strategy of promoting efficient, safe, sustainable, and inclusive movement of people and goods (para. 12). ADB’s future assistance is expected to support the electrification and double-tracking of the Kelani Valley line in 2020, followed by future improvements of the Main and Coast lines. Cofinancing opportunities will be actively explored. ADB’s interventions in the railway subsector supplement ongoing and planned investments in the maritime and road sectors, with the aim of improving domestic and regional connectivity.


\textsuperscript{12} ADB. \textit{Sri Lanka: Colombo Suburban Railway Project}; ADB. \textit{Sri Lanka: Transport Project Preparatory Facility}; and ADB. \textit{Sri Lanka: Railway Master Plan}. The master plan study is expected to be completed by December 2019.

\textsuperscript{13} ADB. \textit{Country Partnership Strategy: Sri Lanka, 2018–2022}. 
D. Problem Tree for Rail Transport (Nonurban)

EFFECTS

Constrained economic growth

- Excessive delays and disruption in train operations
- High transport and logistics costs
- Injuries and accidents linked to railway operations
- High congestion, noise, and air pollution due to increasing road traffic

CORE PROBLEM

Declining railway modal share

CAUSES

Inefficient, slow, and congested railway passenger and freight service delivery in Sri Lanka

- Insufficient railway infrastructure
  - Insufficient track capacity
  - Aging rolling stock
  - Outdated signalling and telecommunication system
- Inefficient operation and maintenance
  - Low operating speeds and frequent delays
  - Uncomputerized operations
  - Inadequate maintenance and asset management
  - Consequent maintenance backlog
  - Inadequate skill set of existing staff for modern operations
- Poor financial performance
  - Insufficient visibility of management on operations
  - Manual ticket sales, collection, and recording
  - Underdeveloped income stream sources and land assets utilization
  - Inadequate governance structure and legal framework
  - Infrequent and below-inflation fare increases
- Deficient railway safety
  - Significant encroachment on railway lines
  - Insufficient railway platform safety
  - Overcrowded carriages
  - Unfenced right-of-way
  - Numerous at-grade level crossings