

Pakistan

Green Roads Profile

General

Road length (2022)
271,132 kilometers

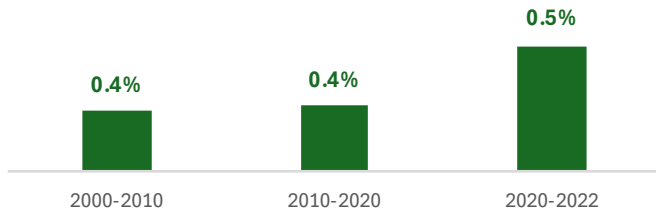
Subregion
(1) **Central and West Asia**

Income class
Low and lower middle income

Average annual growth rate of road length

Population (2024)
(1) **245.2 million**

Land area
771 thousand sqkm (2,3)



Urban population
38%

Rural population
62% (2)

Gross domestic product (GDP PPP, 2022)
1.5 trillion USD

GDP per capita (PPP, 2022)
6,351 USD (2,3)
(3)

Pakistan's road network is comprised of 14.8% motorways, highways, and primary roads and 85.2% secondary roads, local roads, and other roads

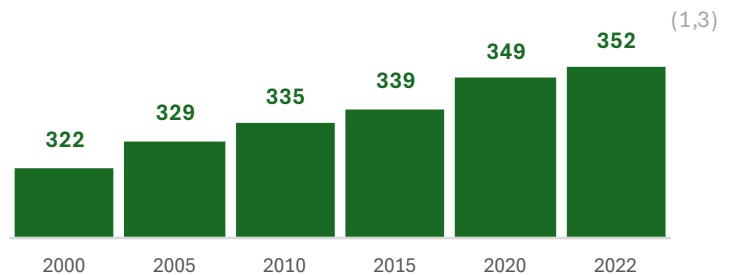
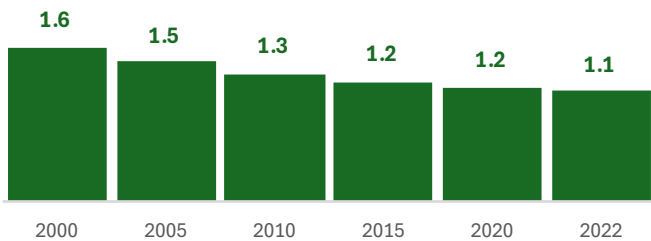
Further information on road length, pavement, and quality by road class is available in Appendix A

Road infrastructure availability (2022)
1.1 kilometers per thousand population

Road infrastructure density (2022)
(1,2) **352 meters per square kilometer** (1,3)

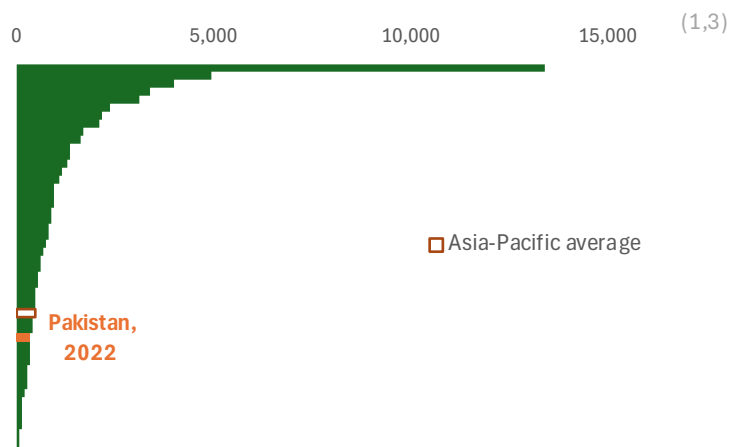
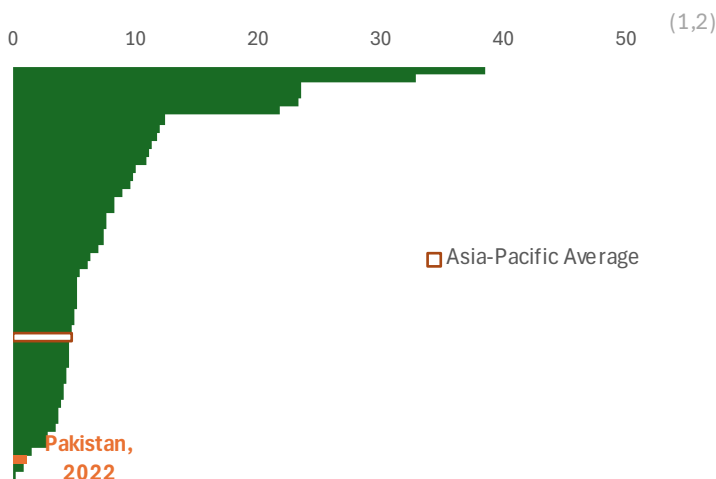
Road infrastructure availability trend, kilometers per thousand population

Road infrastructure density trend, meters per thousand population



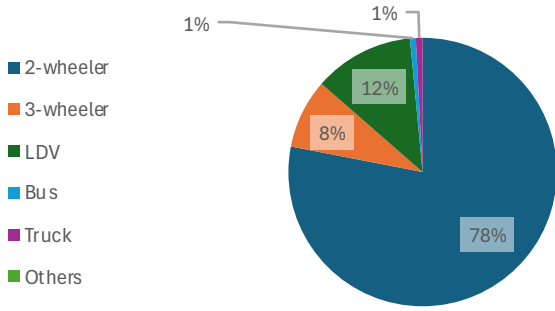
Road infrastructure availability in Asia-Pacific, kilometers per thousand population

Road infrastructure density in Asia-Pacific, meters per square kilometer



Road vehicles (2022)
37.85 million vehicles

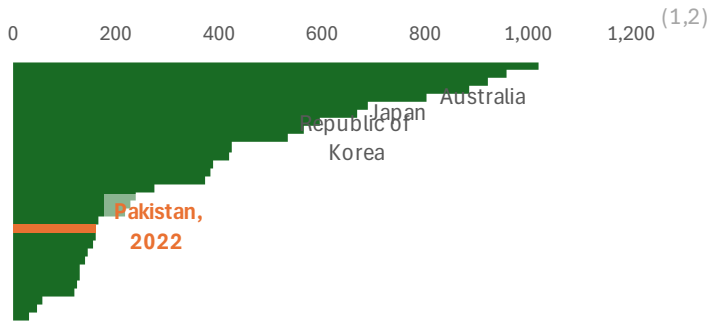
Share of vehicles by type



Motorization rate (2022)
161 vehicles per thousand population

In 2000, Pakistan had 30 vehicles per thousand population. By 2022, this has increased to 161 compared with Asia-Pacific average of 577 in 2022.

Motorization rate in Asia-Pacific, vehicles per thousand population



Road vehicles include 2- and 3-wheelers, LDVs, buses and other informal public transport, trucks, and other unclassified types

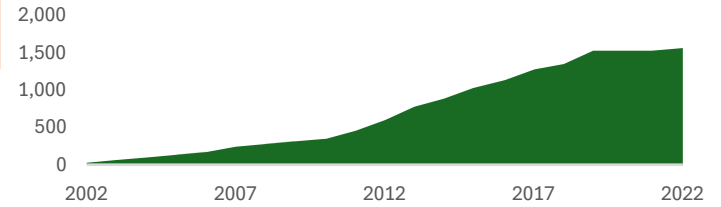
Public-private partnership investments in road sector, cumulative million USD

(1)

Share of road in total public-private partnership investments

(1,2) Official development assistance in road sector, cumulative million USD

(5)



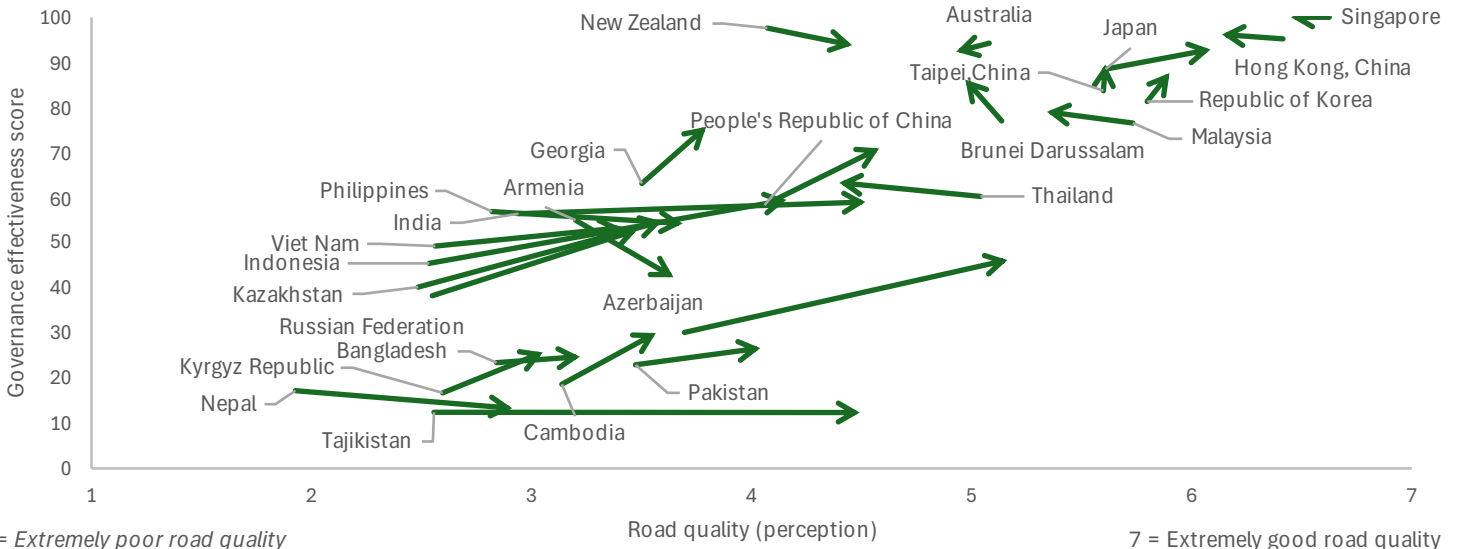
Share of road in total official development assistance

(5)



Road maintenance budget and deficit is available in Appendix B. Road user charging revenue information is available in Appendix C

Road quality (perception) vs. governance effectiveness score (2009-2019)



1 = Extremely poor road quality

7 = Extremely good road quality

Developed with the support of:



Quality of Life and Fostering Inclusive Growth

Rural access index (2023)
68%

(6)

Based on 2015 estimates, only 73% of the population could reach the nearest city in 30 minutes, another 14% could reach in 1 hour, and another 10% could reach only after 3 hours.

Rural population without access to all-season roads (2023)
43.01 million

(2,6)

Logistics performance index score (2023)

n.d.

(10)

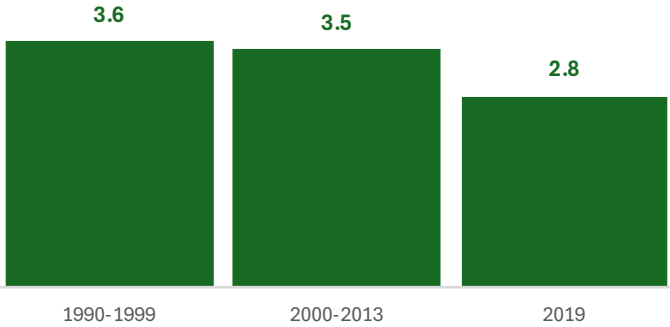
| Infrastructure score

National street network disconnectedness index

(7)

n.d.

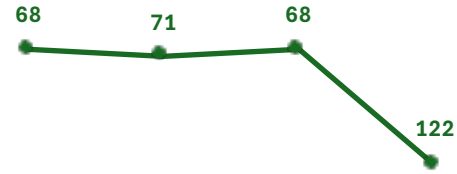
(10)



This indicator is a summary scalar measure for street-network sprawl describing connectivity of local street networks across the world

Logistics performance index ranking trend

(10)



Road crash fatalities (2019)
28.2 thousand deaths

(8)

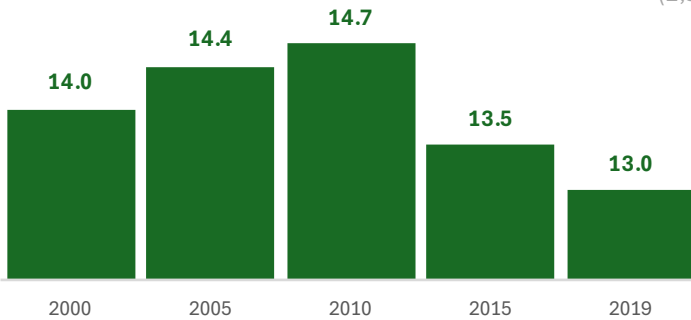
Road crash fatality rate per 100 thousand population

(2,8)

Percent of firms choosing transportation as their biggest obstacle - Manufacturing (2013)

3.3%

(11)



Asia-Pacific average is 15.7 fatalities per 100 thousand population

Percent of respondents answering high/very high - Level of Fees and Charges on Road transport (2018)

40.0%

(11)

Level of fees and charges for less than full truck loads are considered

Mean speed in Asia-Pacific, kilometers per hour (2022)

(9)

0 20 40 60 80 100 120



Mean speed (2022)
94 kilometers per hour

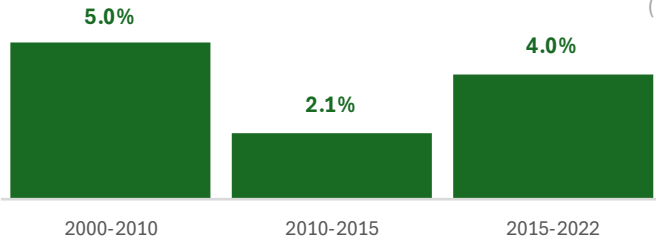
Employment in transport sector (2022)

4.79 million employees

Share of transport sector in total employment (2022)

6.4%

Average annual growth rate of transport sector employment



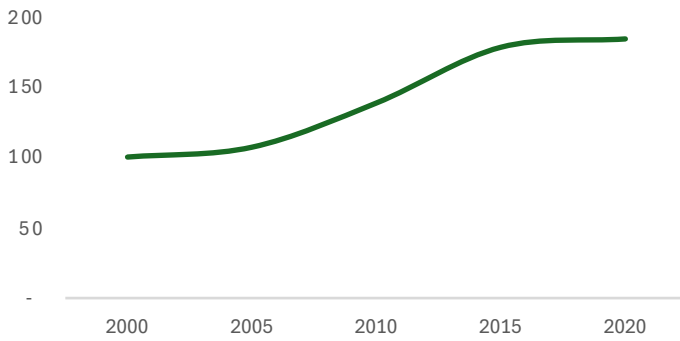
Share of females in total transport sector employment (2022)

0.6%

Decarbonization

Road transport energy consumption trend

Assuming 2000 value as base (100)

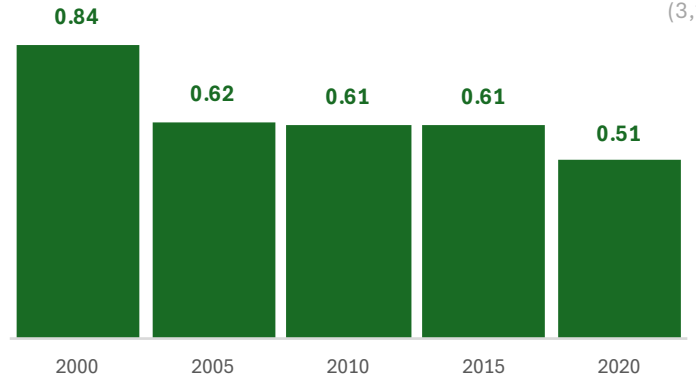


Between 2000-2010, Pakistan's road transport energy consumption grew 3.3% annually. Between 2010-2020, road transport energy consumption grew 2.9% annually.

(13)

94% of Pakistan's transport energy consumption is in the road sector.

Road transport energy intensity with GDP, TJ per USD (PPP)



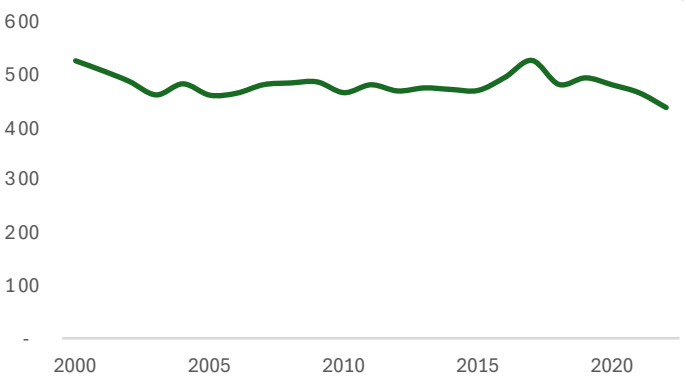
Asia-Pacific average is 0.4 MJ per USD in 2020

(3,13)

Grid emission factor (2022)

435.9 gCO2 per kWh

Grid emission factor trend, gCO2 per kWh

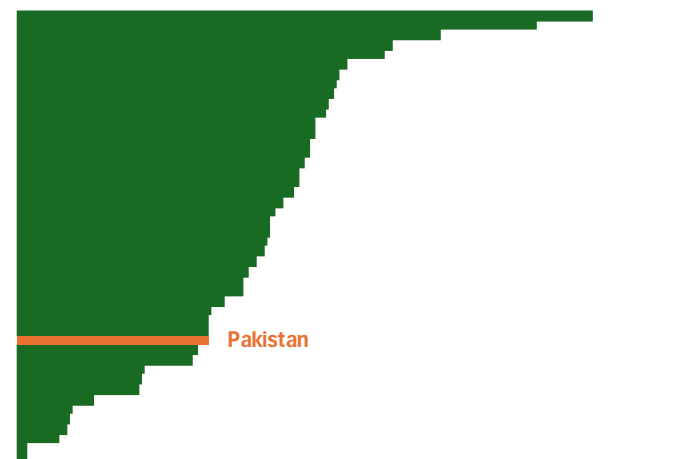


(14)

Grid emission factors in Asia-Pacific, gCO2 per kWh

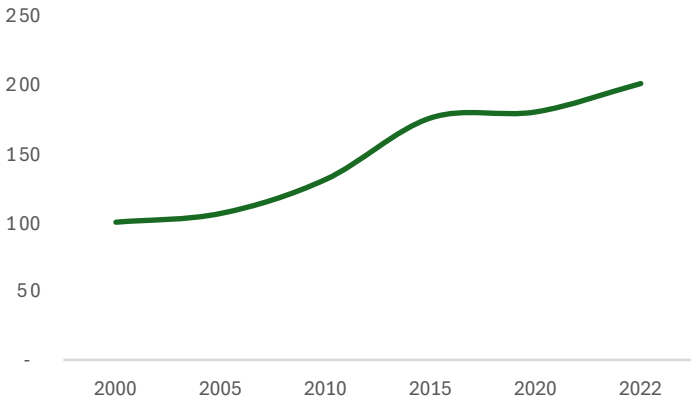
(14)

(14)



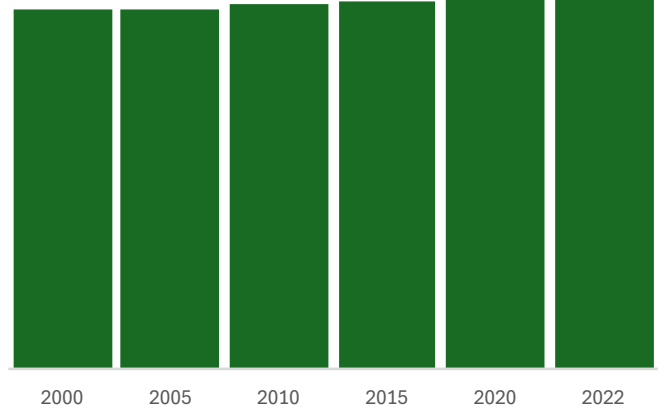
Road transport CO2 emissions trend

Assuming 2000 value as base (100)



Share of road transport in total transport CO2 emissions

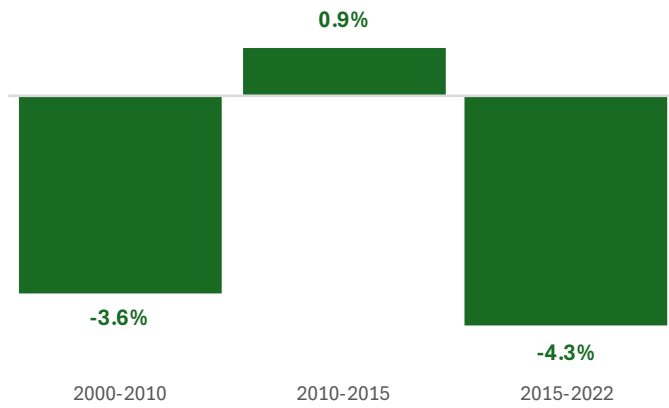
(15)



Between 2010-2019, Pakistan's road transport fossil CO2 emissions was growing 3.8% annually. After the COVID-19 pandemic, road transport CO2 emissions was growing 5.6% annually.

Road transport CO2 emissions intensity with GDP trend

(3,15)



Transport fossil fuel subsidies, cumulative from 2010 to 2022

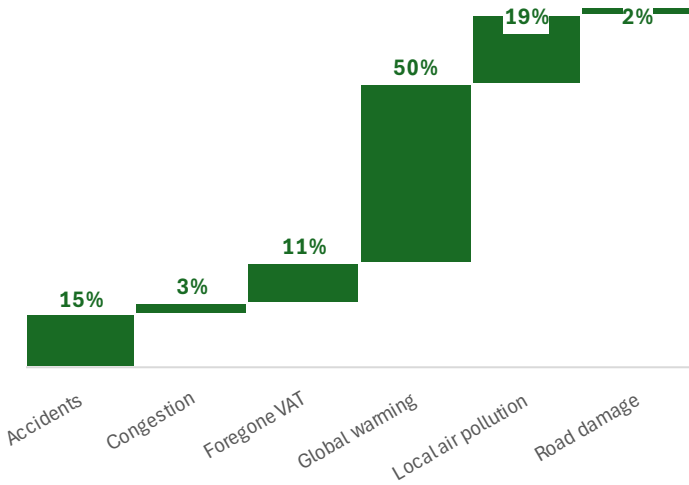
9.44 billion USD

1.5% of Asia-Pacific total

(16)

Implicit fossil fuel subsidies due to externalities

(17)



Data includes all sectors and all fuel types

Climate Resilience and Disaster Preparedness

Expected annual damages to road and rail infrastructure due to hazards (2019)
99.42 million USD

(18)

National road vulnerability index ranking (2023)
n.d.

(20)

Share of road in total transport infrastructure in multihazard average annual loss to transport infrastructure (2023)
96.0%

(19)

Share of population in low elevated coastal zones (2018)
1.1%

(21)

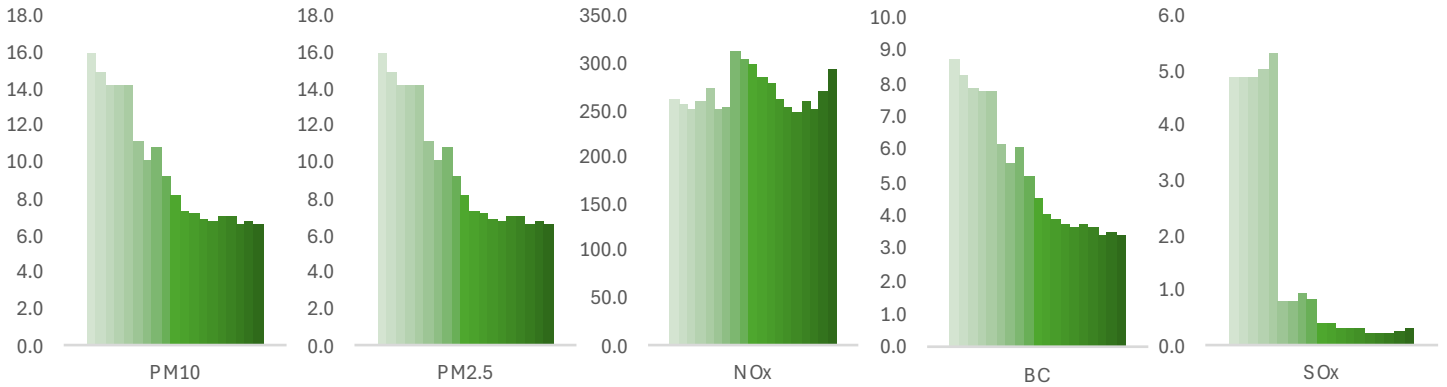
Pollution, Water and Land Management, Preserving Biodiversity, and Sustainable Materials

Paved roads (2019)
74%

(1)

Road transport air pollutant emissions, thousand tonnes (2000-2018)

(15)



In 2022, road transport contributed 36.4%, re-suspended dust contributed 34.6% in transport PM10 emissions. In total, road transport contributed about 8.9% in total PM10 emissions in Pakistan.

Deaths due to occupational exposure to diesel engine exhaust
 | 2000-2010 | 2011-2018
2,307 deaths | **2,787 deaths**

(22)

Terrestrial and marine protected areas (2022)
9.8%

(3)

Share of biofuels in road transport energy consumption (2020)
n.d.

(13)

Terrestrial protected areas
12.3%

(% of total land area)

Marine protected areas
0.8%

(% of territorial waters)

(3)

Domestic consumption per capita, tonnes (2024)
 | Pakistan | Asia-Pacific
3.9 tonnes | **13.8 tonnes**

(23)

Forest area (2021)
4.8%

(% of land area)

(3)

Domestic consumption is the total amount of materials directly used in the economy (used domestic extraction plus imports), minus the materials that are exported.

Developed with the support of:



Policy Measures

Policy document	Year	Road-related measures
National Road Safety Strategy 2018-2030	2018	General infrastructure improvements, Automated enforcement of speed limits, Technical standards for road infrastructure, General transport asset management, Accreditation of road inspection and auditing agencies, Implementation of horizontal deflections on roads, Implementation of vertical deflections on roads, Upgrading high risk locations for road safety, National speed law, Road-side checks on overspeeding, Audits/ star rating for existing roads for road safety, Audits/ star rating required for new road infrastructure for road safety
National Clean Air Plan	2022	Active transport infrastructure expansion, Road charging and tolls, Vehicle taxes
National Transport Policy of Pakistan 2018	2018	Active transport infrastructure expansion, General infrastructure improvements, Reduction of transport/ logistics costs, Transport asset condition assessment, Transport infrastructure resilience, General transport asset management, General economic instruments, General transport finance, Reference to finance mechanisms within country, Implementation of vertical deflections on roads, Measures to improve rural-urban connectivity, Road infrastructure expansion, Passenger and freight load limits, Audits/ star rating for existing roads for road safety, Audits/ star rating required for new road infrastructure for road safety, General adaptation measures
National Climate change Policy	2012	General economic instruments, Request for financial support to develop transport, Adaptation-related education and training
Auto Industry Development and Export Policy 21-26	2021	Investment required for specific projects
National Freight and Logistics Policy	2020	General infrastructure improvements, General transport asset management, General economic instruments, General transport finance, Reference to finance mechanisms within country, Passenger and freight load limits, Road-side checks on overloading
National Aviation Policy	2019	General economic instruments
Technology Needs Assessment Report for Climate Change Mitigation	2016	General economic instruments, General transport finance
Global Status Report on Road Safety 2018	2018	Design standards for sidewalks and bicycle paths, Upgrading high risk locations for road safety, National road safety strategy, National speed law, Audits/ star rating for existing roads for road safety, Audits/ star rating required for new road infrastructure for road safety
Safely Connected: A Regional Road Safety Strategy for CAREC Countries, 2017-2030	2017	General infrastructure improvements, Vehicle inspection and maintenance, Technical standards for road infrastructure, Request for financial support to develop transport, National road safety strategy, Passenger and freight load limits, Audits/ star rating for existing roads for road safety, Audits/ star rating required for new road infrastructure for road safety
Pakistan Updated NDC 2021	2021	Reference to finance mechanisms within country
Pakistan's First Biennial Update Report	2022	Vehicle inspection and maintenance, Investment required for specific projects
Pakistan's Intended Nationally Determined Contribution	2015	Transport infrastructure resilience, Development of transport adaptation/ emergency/ disaster plan/ policy
Pakistan 2025	2014	Measures to improve rural-urban connectivity, Road infrastructure expansion
Technology Needs Assessment Report for Climate Change Adaptation	2016	Disaster notification/ early warning system
International Energy Charter	2015	General infrastructure improvements
Pakistan in the 21st Century Vision 2030	2007	Target - Transport activity, Measures to improve rural-urban connectivity, Road infrastructure expansion
Road Safety Opportunities and Challenges: Low- and Middle-Income Country Profiles	2020	Vehicle inspection and maintenance, Implementation of vertical deflections on roads

Policy Targets

Policy document	Target year	Road-related targets
National Road Safety Strategy 2018-2030	2030	<p>By 2030, all new national and provincial highway construction or improvements achieve technical standards for all road users that take into account road safety, or, alternatively meet a 3-star rating or better</p> <p>By 2030 all new or rehabilitation (improvement) road designs should always have a higher safety rating than the existing road and have at least a 3-star rating standard for all road users</p> <p>By 2030 national highways with more than 50,000 vehicles per day to have a minimum of three stars for all users</p> <p>By 2030 sections of national highway network passing through linear settlements to have a minimum four-star standard for motorcyclists, pedestrians and bicyclists</p>
National Road Safety Strategy 2018-2030	2030	<p>By 2030, all new national and provincial highway construction or improvements achieve technical standards for all road users that take into account road safety, or, alternatively meet a 3-star rating or better</p> <p>By 2030 all new or rehabilitation (improvement) road designs should always have a higher safety rating than the existing road and have at least a 3-star rating standard for all road users</p>
Pakistan 2025	2025	<p>raise road-density to a level of 0.45 km/sq.km, which will increase the existing road national network from around 260,000 km to 358,000 km</p>
Pakistan in the 21st Century Vision 2030	2030	<p>It is proposed to increase the share of railways in national freight from present 4 percent (6 billion-ton km) to 22 percent (81 billion-ton km) by 2030.</p>
National Road Safety Strategy 2018-2030	2030	<p>By 2030, more than 75 percent of travel on existing national highway network is on roads that meet technical standards for all road users which take into account road safety.</p>

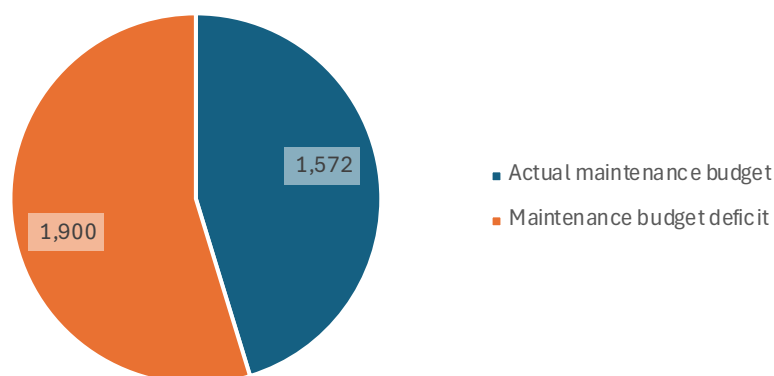
Appendix

A. Road length, pavement ratio, and quality by road class

Road class	Length	Paved	Quality			
			Good	Fair	Poor	Very Poor
Expressway	428	100%	39%	20%	22%	19%
Motorway	2,471	100%	39%	20%	22%	19%
Highway	32,097	100%	39%	20%	22%	19%
Metro road	76					
Primary road	4,388					
Secondary road	87,766					
Local road	373,525	20%				

Definitions and sources are available in "Asian Development Bank, 2024. The Future of Road User Charging in Developing Asia and the Pacific: Road Maintenance Financing and Cost Recovery Options"

B. Maintenance needs and budget, million USD



C. Road user charge revenues

Road user charge	Revenue (million USD)
Fuel levy	2,678.0
Fuel excise duty	35.0
Fuel customs duty	1,115.0
Fuel sales tax	1,762.0
Vehicle excise duty	95.0
Vehicle customs duty	394.0
Vehicle sales tax	339.0
Traffic fines	17.0
Right-of-way fees	12

Notes



(*) Policy measures and targets were extracted from policy documents as listed in the ATO National Transport Policies Database

<https://bit.ly/ATOpolicyrepository>

References

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- (22) Global Health Data Exchange (GBD, 2019), <https://vizhub.healthdata.org/gbd-results/>
- (23) Global Materials Flow Database (UNEP, 2023), <https://www.resourcepanel.org/global-material-flows-database>

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This profile was developed by Asian Transport Outlook in support of TA-6756 Improving Infrastructure Sustainability Through Better Asset Management – Developing a Green Roads Toolkit and Guidance for ADB Projects. 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.

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