

Pakistan

Transport Climate Profile

Population (2024)
245.2 million

Urban population
38%

Rural population
62%

Below 18 y.o.
44%

Above 60 y.o.
7%

Population density
312 persons per sqkm

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

Income class
Low and lower middle income

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

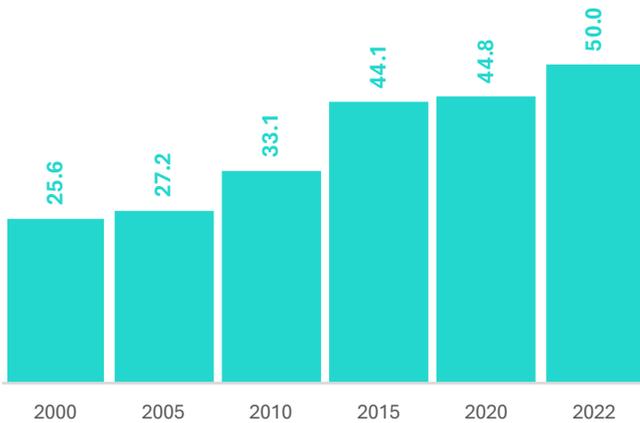
GDP per capita (PPP, 2022)
6,351 USD (1,2)
(2)

(1) Domestic consumption per capita, tonnes (2024)
3.9 tonnes (3)

(1,2) *Domestic consumption is the total amount of materials directly used in the economy (used domestic extraction plus imports), minus the materials that are exported.*

Transport and Climate Change

Transport fossil CO2 emissions, million tonnes



(4) *In 2010, transport contributed 21.8% of total fossil CO2 emissions. By 2022, transport contributed 25.1%.*

Share of transport CO2 emissions by mode (2022)

| Road **97.9%** (4)
| Rail **1.7%**

| Navigation **0.0%** (4)
| Aviation **0.4%**

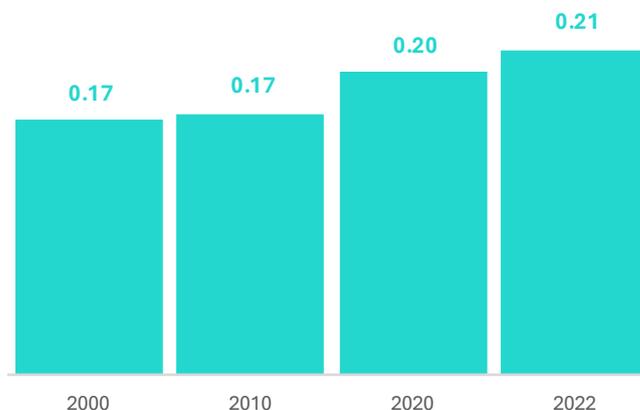
Navigation and aviation only includes domestic transportation

Between 2000-2015, road transport contributed 96.2% in transport fossil CO2 emissions. Between 2016-2022, road transport contributed 97.8%.

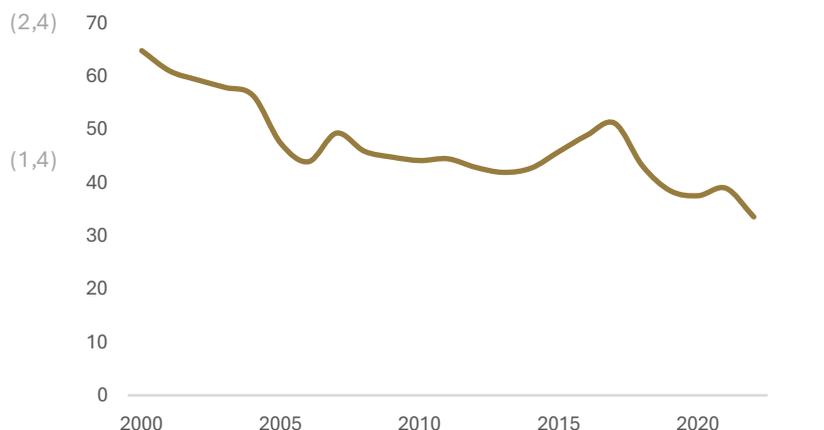
Transport CO2 emissions intensity with GDP, 2022
33.4 gCO2 per USD

Asia-Pacific average is 33.2 gCO2 per USD

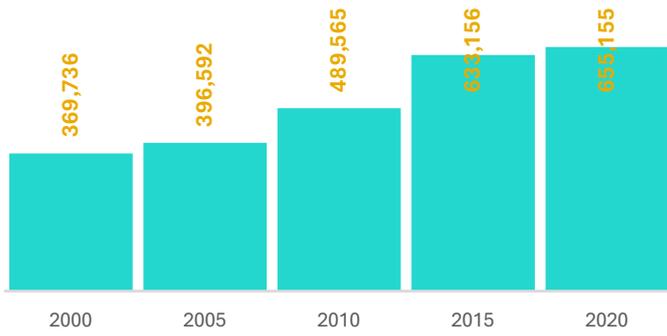
Transport fossil CO2 emissions per capita, tonnes



Transport CO2 emissions intensity with GDP trend, gCO2 per USD (2,4)



Transport energy consumption, terajoules

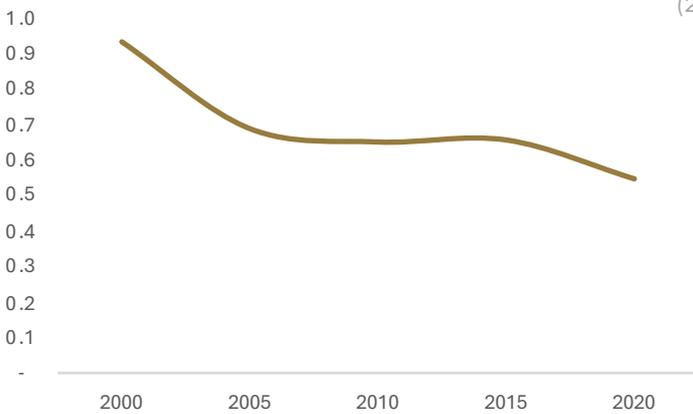


Transport energy intensity with GDP, 2020

0.5 MJ per USD

Asia-Pacific average is 0.5 MJ per USD

Transport energy intensity with GDP trend, MJ per USD

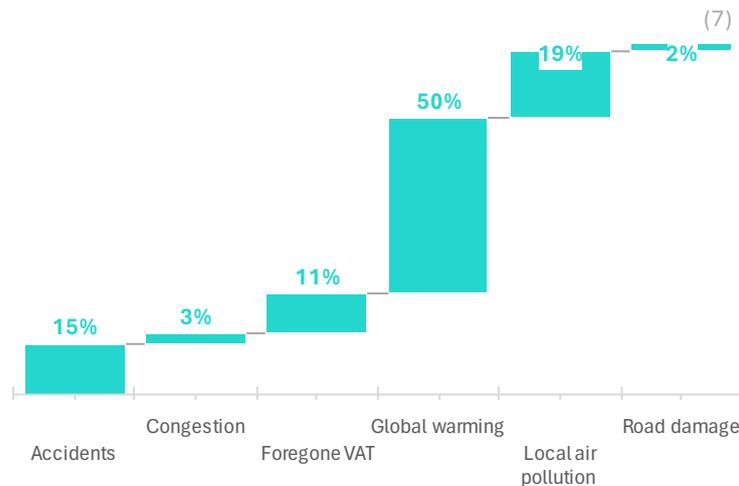


Transport fossil fuel subsidies, cumulative from 2010 to 2022

9.44 billion USD

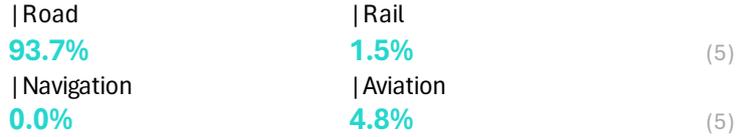
1.5% of Asia-Pacific total

Implicit fossil fuel subsidies due to externalities



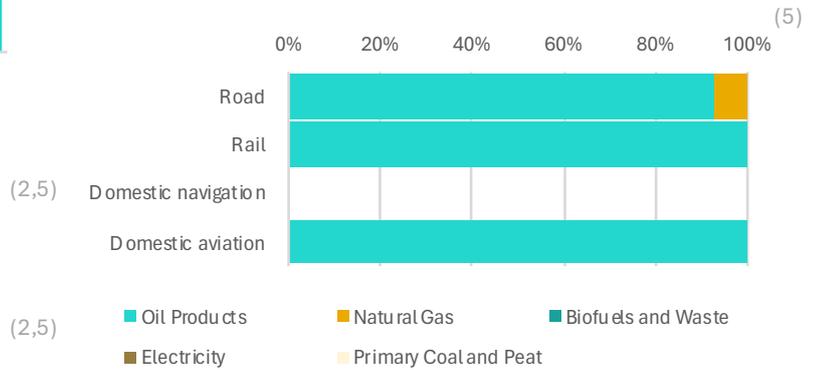
Data includes all sectors and all fuel types

Share of transport energy consumption by mode (2020)



Navigation and aviation only includes domestic transportation

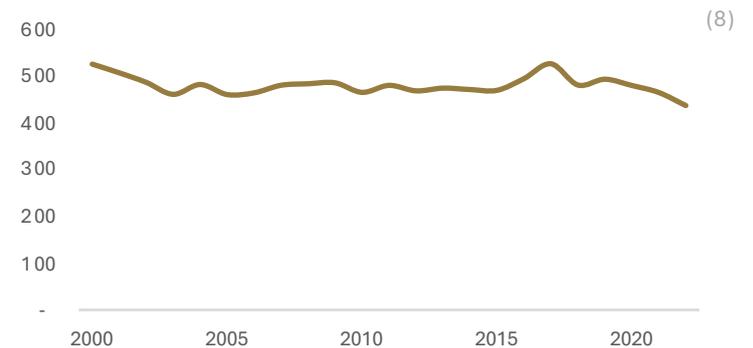
Share of transport energy consumption by source (2020)



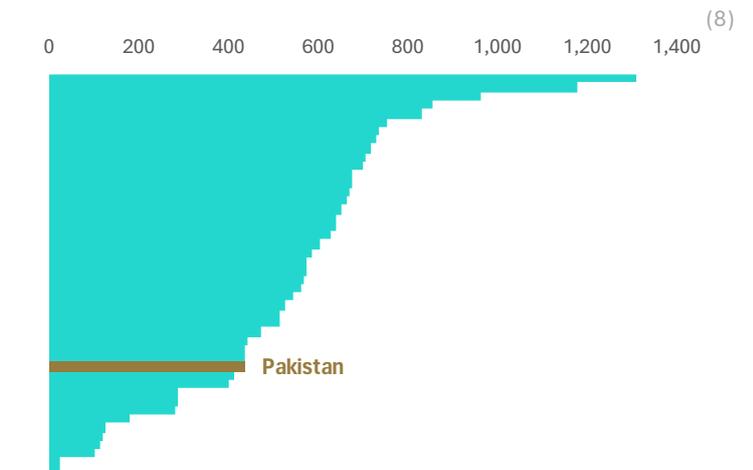
Grid emission factor (2022)

435.9 gCO₂ per kWh

Grid emission factor trend, gCO₂ per kWh



Grid emission factors in Asia-Pacific, gCO₂ per kWh



Vehicle Fleet

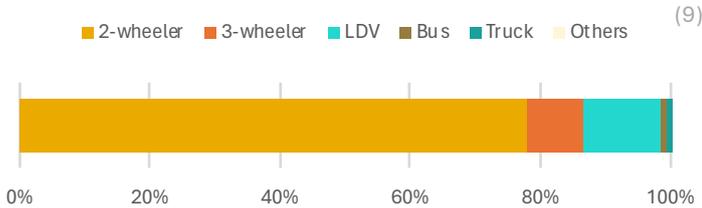
Road vehicles (2022)
37.85 million vehicles

Road vehicle motorization rate (2022)
161 vehicles per thousand population

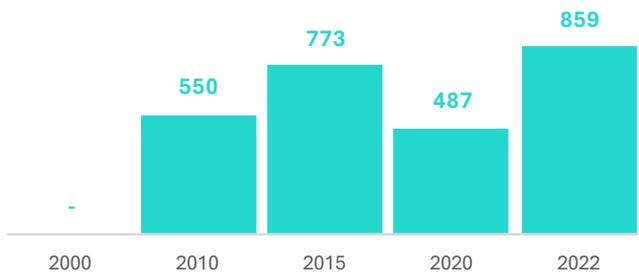
Road vehicles include 2- and 3-wheelers, LDVs, buses and other informal public transport, trucks, and other unclassified types

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.

Share of vehicles by type



Bus vehicle production, units



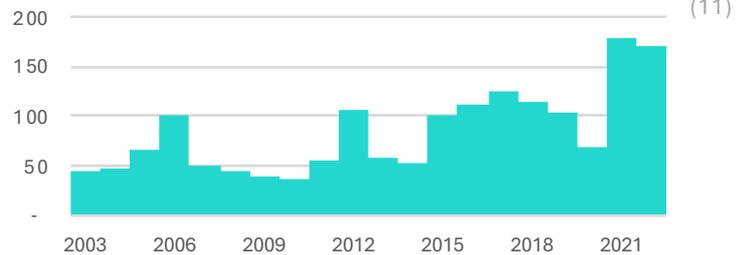
Electric road vehicle import value (2017-2022)
 (9) | Total **645.1 million USD** | Hybrid-electric **531 million USD** (11)

(1,9) Electric road vehicle share in total road vehicle import value trend (11)



Bus import value (2017-2022)
650.9 million USD (11)

(10) Bus import value trend, assuming 2015=100 (11)



Adaptation

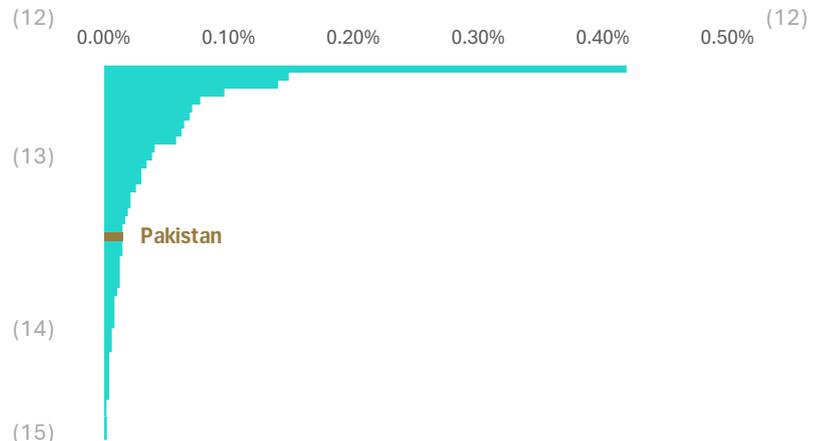
Average annual losses to transport infrastructure due to hazards (2023)
218.74 million USD

Share of average annual losses due to hazards, by mode (2022)
 | Road **96%** | Rail **2%**
 | Ports **0%** | Airports **1%**

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

Share of population in low elevated coastal zones (2018)
1%

Average annual losses to transport infrastructure due to hazards, as a share of GDP, in Asia-Pacific (2023)

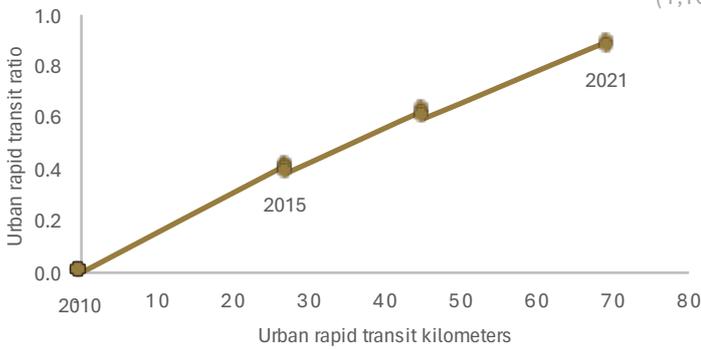


Urban Transport

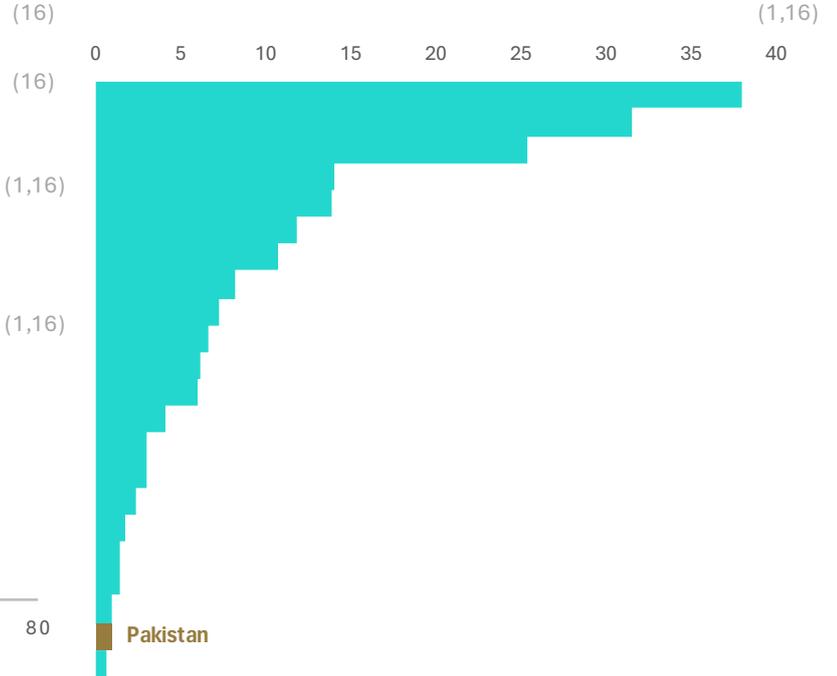
Urban rapid transit length (2021)
 | BRT **69 kilometers**
 | LRT **None**
 | Metro **None**

Urban rapid transit ratio (2021)
0.87 kilometers per million urban population

Urban rapid transit ratio, kilometers per million urban population (2000-2021)



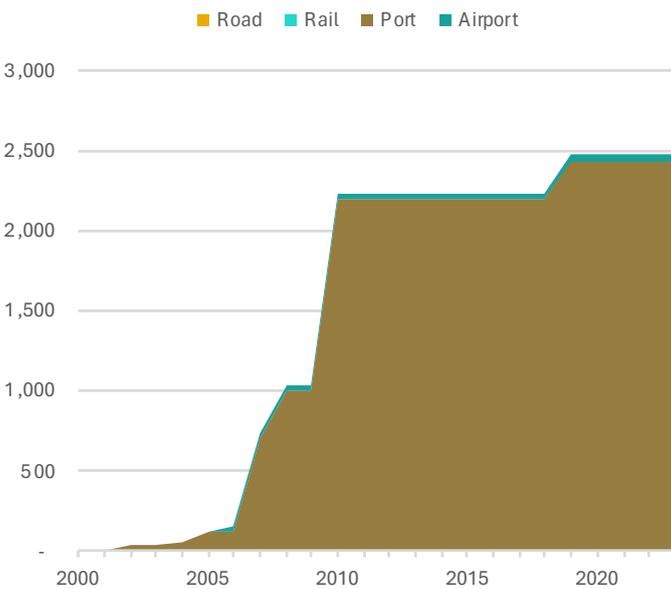
Urban rapid transit ratio in Asia-Pacific, kilometers per million urban population (2021)



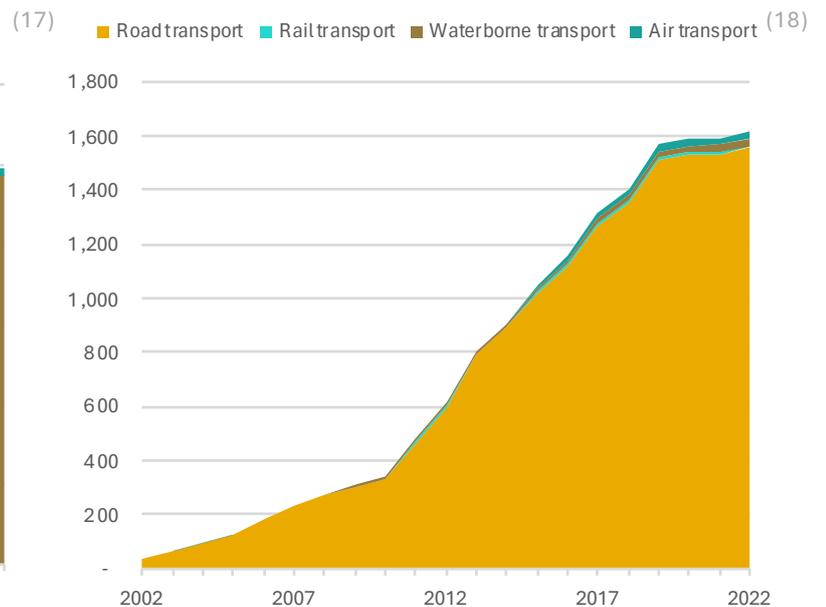
Based on 2015 estimates, only 73% of the population could reach the nearest city in 30 minutes, another 14% could reach in 1 hour, and another 10% could reach only after 3 hours.

Transport Investment

Public-private partnership investments in the transport sector, million USD

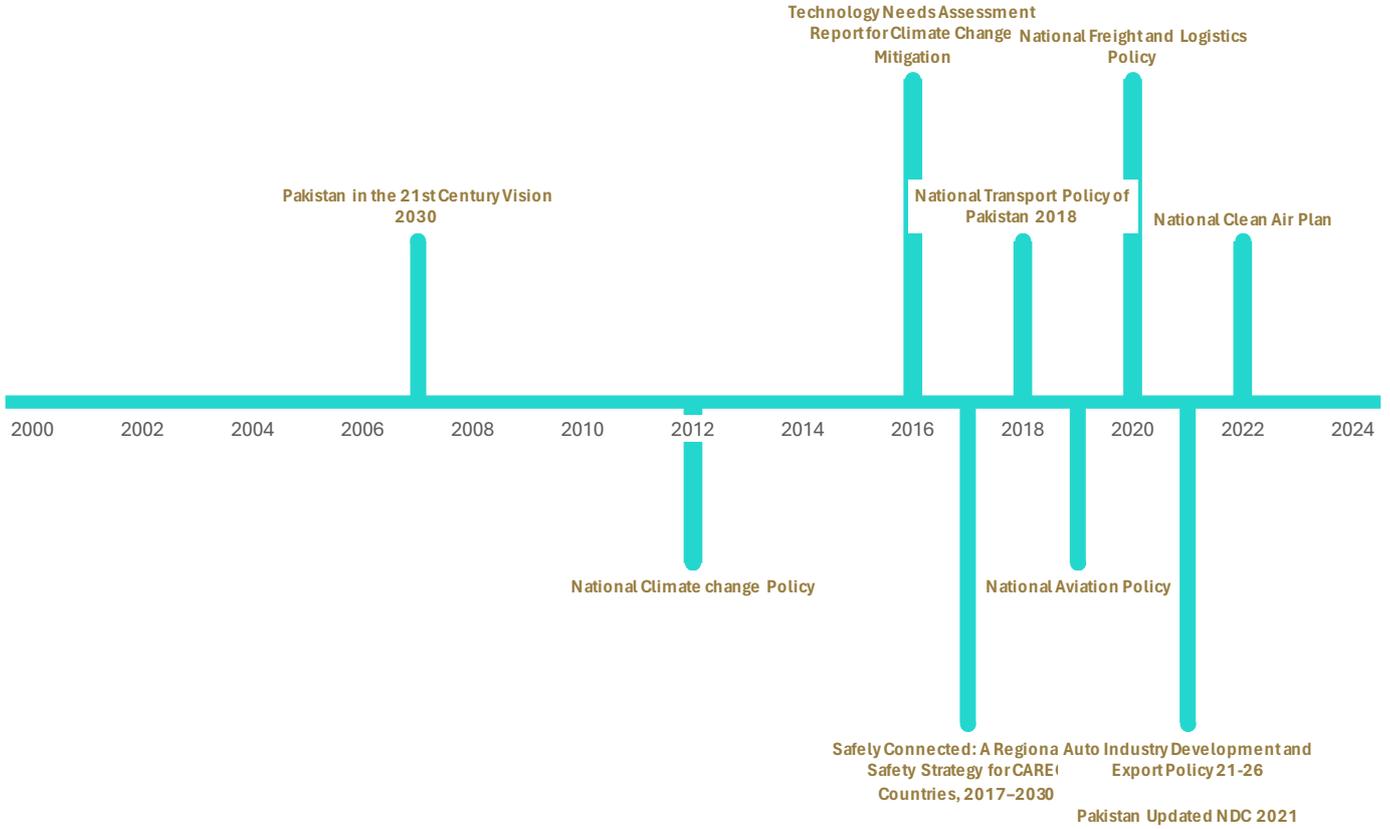


Official development assistance in the transport sector, million USD



Transport Climate Policy Documents

Transport-related policy documents in Pakistan



Selection made based on the number of climate change mitigation and adaptation

Nationally Determined Contributions

		Road transport	Rail transport	Domestic navigation	Domestic aviation	Urban transport
Pakistan Updated NDC 2021 (adopted in 2021)	Mitigation measures	Yes	Yes	Yes	Yes	Yes
	Mitigation targets	Yes				
	Adaptation measures	Yes	Yes	Yes	Yes	
	Adaptation targets					

Long-term Strategies

		Road transport	Rail transport	Domestic navigation	Domestic aviation	Urban transport
None	Mitigation measures					
	Mitigation targets					
	Adaptation measures					
	Adaptation targets					

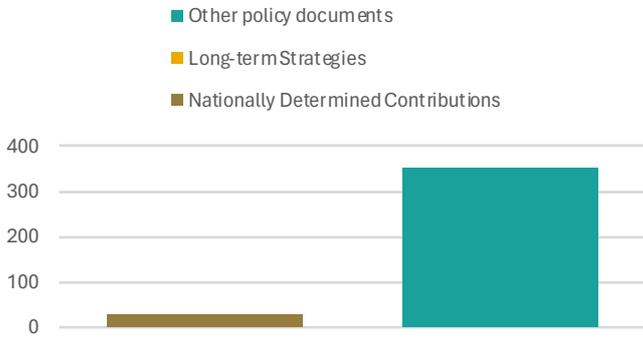


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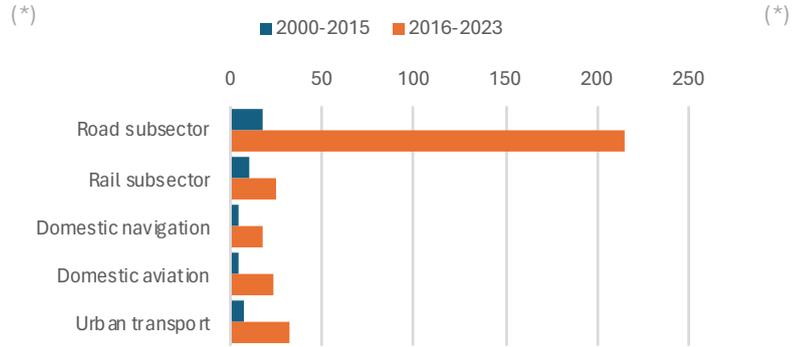


Transport Climate Policy Overview

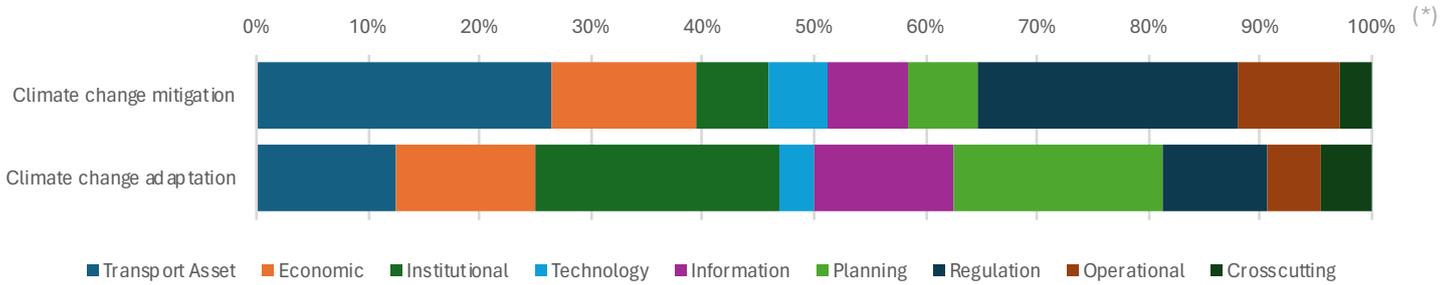
Number of measures by source



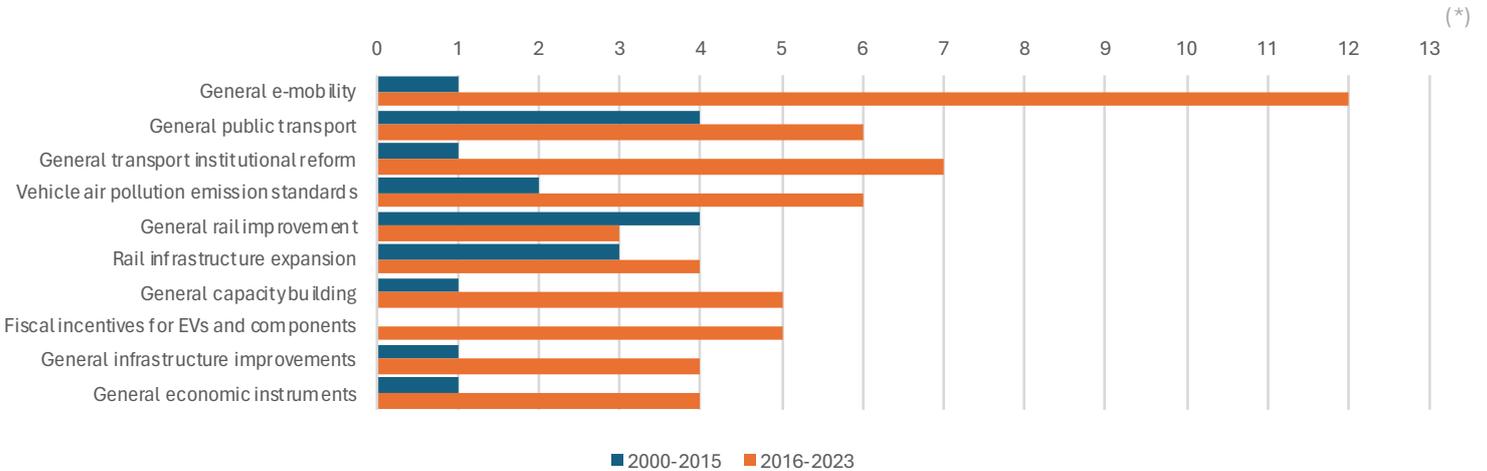
Number of climate change measures by subsectors



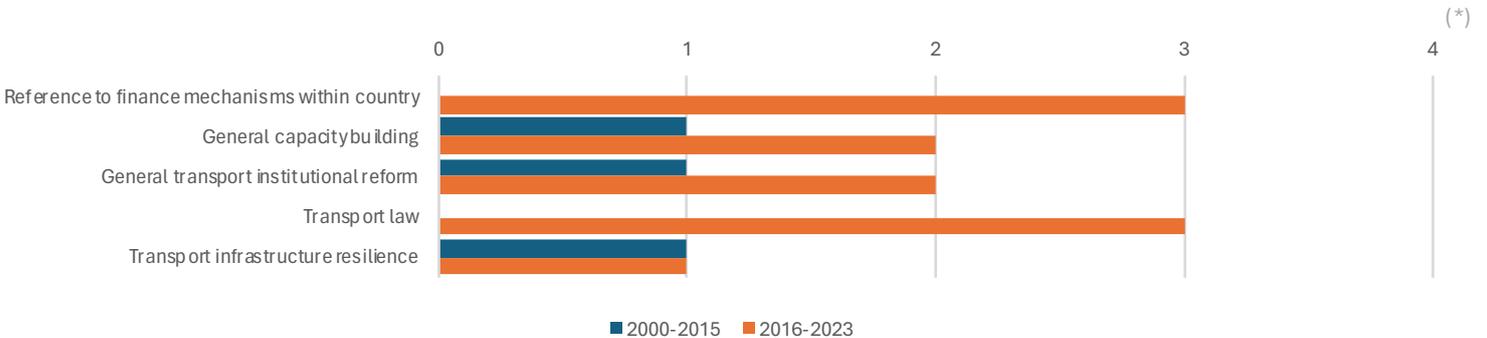
Transport-related climate change by framework



Climate change mitigation top 10 typology, number of measures



Climate change adaptation top 5 typology, number of measures



Climate Change Mitigation Policy Measures - Road Transport

Policy document	Year	Measures
National Clean Air Plan	2022	Active transport infrastructure expansion, Fiscal incentives for EVs and components, General e-mobility, Fuel quality, Vehicle scrappage scheme, Low-emission vehicle zones, Road charging and tolls, Vehicle taxes, General parking measures, Accreditation of vehicle inspection centers, Vehicle air pollution emission standards
National Transport Policy of Pakistan 2018	2018	Development of active transport plan/ policy, Active transport infrastructure expansion, General data repositories and data collection, General e-mobility, Freight consolidation, Fuel quality, Intelligent transport systems (ITS), BRT, Bus fleet renewal, General transport asset management, Traffic management, General parking measures, Implementation of vertical deflections on roads, Road infrastructure expansion, Development of other transport-related plan/ policy, Passenger and freight load limits, Vehicle air pollution emission standards, General vehicle improvements, Vehicle manufacturing
59 UN Transport Agreements/ and Conventions Serviced by ECE	2021	Convention on Road Traffic 1968
Auto Industry Development and Export Policy 21-26	2021	EV charging infrastructure, EV manufacturing, Fiscal incentives for EVs and components, Smart charging, General public transport, Energy efficient vehicle purchase incentives, Investment required for specific projects, General capacity building, General transport institutional reform, Stakeholder Involvement, Development of automotive plan/ policy, General vehicle improvements, Vehicle manufacturing, Local production, services, contracting etc.
National Freight and Logistics Policy	2020	General data repositories and data collection, Programs to reduce emissions in logistics, Intermodality measures, General infrastructure improvements, Vehicle scrappage scheme, General transport asset management, Alternative trip schedules, General economic instruments, General parking measures, Reference to finance mechanisms within country, Logistics hub, Transport law, Passenger and freight load limits, Road-side checks on overloading, Vehicle air pollution emission standards, General vehicle improvements, Vehicle manufacturing
National Road Safety Strategy 2018-2030	2018	General infrastructure improvements, Automated enforcement of speed limits, Technical standards for road infrastructure, Training of enforcement authorities, Speed limits on urban roads <= 30 kph, Road-side checks on overspeeding, General education and behavior change, General vehicle improvements
Alternative and Renewable Energy Policy	2011	Biofuels
National Climate change Policy	2012	General active mobility, General e-mobility, Biofuels, LPG/ CNG/ LNG, Vehicle air pollution emission standards
Pakistan Updated NDC 2021	2021	EV manufacturing, Fiscal incentives for EVs and components, General e-mobility, BRT, Reference to finance mechanisms within country, Technology and knowledge transfer, Vehicle air pollution emission standards
Pakistan's First Biennial Update Report	2022	Development of e-mobility transport plan/policy, General e-mobility, General freight and logistics improvements, Vehicle inspection and maintenance, BRT, General public transport, General transport institutional reform, Vehicle efficiency standards
Pakistan's Intended Nationally Determined Contribution	2015	BRT
Global Status Report on Road Safety 2018	2018	Design standards for sidewalks and bicycle paths, National speed law, Local authorities have the power to modify national speed limits, Speed limits on urban roads <= 30 kph, Speed limit on rural roads <= 70 kph, Speed limit on motorways <= 90 kph
Electric Vehicle & New Technology Policy 2020-2025 (Draft)	2020	EV charging infrastructure, EV manufacturing, Fiscal incentives for EVs and components, Smart charging, General e-mobility, Vehicle scrappage scheme
International Energy Charter Pakistan 2025	2015	Fuel quality
	2014	General active mobility, Road infrastructure expansion

Climate Change Mitigation Policy Measures - Road Transport

Policy document	Year	Measures
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, Technical standards for general transport infrastructure, General international conventions, Request for financial support to develop transport, Technology and knowledge transfer, Training of enforcement authorities, General capacity building, General transport institutional reform, Reporting, transparency, feedback mechanism, Transport law, Passenger and freight load limits
Technology Needs Assessment Report for Climate Change Mitigation	2016	General e-mobility, Vehicle air pollution emission standards
Pakistan in the 21st Century Vision 2030	2007	Logistics hub, Road infrastructure expansion, Vehicle air pollution emission standards
Road Safety Opportunities and Challenges: Low- and Middle-Income Country Profiles	2020	Vehicle inspection and maintenance, Vehicle import inspections, Vehicle restrictions (import, age, access, sale, taxation)

Climate Change Mitigation Targets - Road Transport

Policy document	Target year	Targets
Alternative and Renewable Energy Policy	2025	by 2025 at least ten percent (10%) bio-diesel shall comprise the annual volume of diesel fuel (B10),
Pakistan's First Biennial Update Report	2030	Further the Government has introduced the Electric Vehicle Policy, which targets a robust electric vehicle market having a 30% and 90% share in passenger vehicles and heavyduty trucks by 2030 and 2040 respectively.
National Clean Air Plan	2030	30% shift to electric passenger vehicles and 50% shift to electric two/three wheelers and buses by 2030
Pakistan Updated NDC 2021	2030	By 2030, 30 % of all new vehicles sold in Pakistan in various categories will be Electric Vehicles (EVs).
Pakistan Updated NDC 2021	2030	30% shift to electric passenger vehicles and 50% shift to electric two/three wheelers and buses by 2030
Pakistan Updated NDC 2021	2030	target of 30% and 90% share in sale of passenger vehicles and heavy-duty trucks by 2030 and 2040
Pakistan Updated NDC 2021	2040	90% shift to electric passenger vehicles and 90% shift to electric two/three wheelers and buses by 2040
National Road Safety Strategy 2018-2030	2030	By 2030, 100 percent of new and used vehicles (produced, sold, or imported) meet high quality safety standards which meet or exceed UN Regulations and Vehicle Technical Regulations
Pakistan 2025	2025	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
National Road Safety Strategy 2018-2030	2030	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.
National Clean Air Plan	2030	Implement fuel quality standards in transport to comply with Euro-5 or Euro-6 leading to complete shift to minimum Euro-5 by 2025, or Euro-6 by 2030

Climate Change Mitigation Policy Measures - Rail Transport

Policy document	Year	Measures
Pakistan's Intended Nationally Determined Contribution	2015	BRT, Urban passenger rail infrastructure improvement
National Clean Air Plan	2022	Development of logistics plan/policy, Programs to reduce emissions in logistics
National Freight and Logistics Policy	2020	General rail improvement, Freight rail infrastructure improvement, Rail infrastructure expansion, General transport institutional reform, Development of rail plan/ policy, Transport law
National Transport Policy of Pakistan 2018	2018	General data repositories and data collection, Freight transport shifting to rail or inland waterways (IWT), General rail improvement, General innovations and digitalization, Urban passenger rail infrastructure improvement, Freight rail infrastructure improvement, Rail infrastructure expansion
Pakistan Updated NDC 2021	2021	General alternative fuels, Urban passenger rail infrastructure improvement, Reference to finance mechanisms within country
Pakistan's First Biennial Update Report	2022	General freight and logistics improvements, Urban passenger rail infrastructure improvement, General public transport, Investment required for specific projects
National Climate change Policy	2012	General rail improvement, Rail infrastructure expansion
Pakistan 2025	2014	General rail improvement, Rail infrastructure expansion
Pakistan in the 21st Century Vision 2030	2007	General rail improvement, High-speed rail (HSR), Target - Transport activity, Rail infrastructure expansion
Technology Needs Assessment Report for Climate Change Mitigation	2016	General rail improvement, Rail infrastructure expansion

Climate Change Mitigation Targets - Rail Transport

Policy document	Target year	Targets
Pakistan in the 21st Century Vision 2030	2030	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.

Climate Change Mitigation Policy Measures - Domestic Navigation

Policy document	Year	Measures
National Clean Air Plan	2022	Development of logistics plan/policy, Programs to reduce emissions in logistics
National Transport Policy of Pakistan 2018	2018	General data repositories and data collection, General inland waterways (IWT) improvement, Development of shipping/ maritime/ inland water transport (IWT) plan/ policy, General shipping improvement, Port infrastructure improvements, Development of other transport-related plan/ policy
National Freight and Logistics Policy	2020	Intermodality measures, Development of public transport plan/ policy, Development of shipping/ maritime/ inland water transport (IWT) plan/ policy, General shipping improvement, General transport finance, Port infrastructure improvements, General transport institutional reform
National Climate change Policy	2012	General inland waterways (IWT) improvement
Technology Needs Assessment Report for Climate Change Mitigation	2016	General inland waterways (IWT) improvement
Pakistan in the 21st Century Vision 2030	2007	General shipping improvement, Port infrastructure improvements
Pakistan 2025	2014	Intermodality measures
Pakistan Updated NDC 2021	2021	Reference to finance mechanisms within country

Climate Change Mitigation Policy Measures - Domestic Aviation

Policy document	Year	Measures
National Aviation Policy	2019	Development of aviation plan/policy, Air traffic management, Aircraft fleet renovation, Jet fuel policies, General aviation improvements, General freight and logistics improvements, General innovations and digitalization, Public transit integration, General economic instruments, Technology and knowledge transfer, General capacity building, Logistics hub, Define roles and accountabilities across agencies, General transport institutional reform, Vehicle manufacturing
National Climate change Policy	2012	Air traffic management, Aircraft fleet renovation
Technology Needs Assessment Report for Climate Change Mitigation	2016	Aircraft fleet renovation
Pakistan 2025	2014	Development of aviation plan/policy, General aviation improvements, Intermodality measures
National Clean Air Plan	2022	Development of logistics plan/policy, Programs to reduce emissions in logistics
National Freight and Logistics Policy	2020	General aviation improvements
National Transport Policy of Pakistan 2018	2018	General aviation improvements, General data repositories and data collection, General transport institutional reform
Pakistan Updated NDC 2021	2021	Reference to finance mechanisms within country

Climate Change Mitigation Policy Measures - Urban Transport

Policy document	Year	Measures
National Clean Air Plan	2022	Active transport infrastructure expansion, Road charging and tolls
National Transport Policy of Pakistan 2018	2018	Development of active transport plan/ policy, Active transport infrastructure expansion, Freight consolidation, General freight and logistics improvements, Fuel quality, Intelligent transport systems (ITS), Transit-oriented development (TOD), BRT, Public transit integration, Urban passenger rail infrastructure improvement, Traffic management, General parking measures, Implementation of vertical deflections on roads, General transport institutional reform, Development of other transport-related plan/ policy
National Freight and Logistics Policy	2020	Freight consolidation, General freight and logistics improvements, General land use, Alternative trip schedules, General parking measures, Involvement of subnational government for transport activities
Pakistan Updated NDC 2021	2021	BRT, Urban passenger rail infrastructure improvement
Pakistan's Intended Nationally Determined Contribution	2015	BRT, Urban passenger rail infrastructure improvement
Auto Industry Development and Export Policy 21-26	2021	EV charging infrastructure
National Climate change Policy	2012	General active mobility, General public transport
Pakistan 2025	2014	General active mobility, General land use
Electric Vehicle & New Technology Policy 2020-2025 (Draft)	2020	General e-mobility
National Road Safety Strategy 2018-2030	2018	General infrastructure improvements
Pakistan in the 21st Century Vision 2030	2007	General public transport
Technology Needs Assessment Report for Climate Change Mitigation	2016	General public transport
Global Status Report on Road Safety 2018	2018	Speed limits on urban roads ≤ 30 kph
Pakistan's First Biennial Update Report	2022	Urban passenger rail infrastructure improvement

Climate Change Adaptation Policy Measures

Policy document	Year	Measures
National Climate change Policy	2012	Request for financial support to develop transport, Adaptation-related education and training (Sub-sectors: NA)
National Transport Policy of Pakistan 2018	2018	Technical standards for general transport infrastructure, Transport asset condition assessment, Transport infrastructure resilience, General transport asset management, Reference to finance mechanisms within country, Technology and knowledge transfer, Define roles and accountabilities across agencies, Involvement of subnational government for transport activities, Reporting, transparency, feedback mechanism, Stakeholder Involvement, Development of other transport-related plan/ policy, Transport law, General adaptation measures (Sub-sectors: Road transport, Domestic Navigation, Urban transport)
Auto Industry Development and Export Policy 21-26	2021	Stakeholder Involvement, Development of automotive plan/ policy (Sub-sectors: Road transport)
National Freight and Logistics Policy	2020	Development of public transport plan/ policy, General transport asset management, Reference to finance mechanisms within country, General capacity building, Involvement of subnational government for transport activities, Development of other transport-related plan/ policy, Development of rail plan/ policy, Transport law (Sub-sectors: Road transport, Rail transport, Domestic Navigation, Urban transport)
Pakistan's Intended Nationally Determined Contribution	2015	Transport infrastructure resilience, Financial instruments to support decarbonisation, General transport institutional reform, Development of transport adaptation/ emergency/ disaster plan/ policy (Sub-sectors: NA)
Technology Needs Assessment Report for Climate Change Adaptation	2016	Disaster notification/ early warning system (Sub-sectors: NA)
Pakistan in the 21st Century Vision 2030	2007	General capacity building (Sub-sectors: NA)
Safely Connected: A Regional Road Safety Strategy for CAREC Countries, 2017–2030	2017	General international conventions, Request for financial support to develop transport, Technology and knowledge transfer, General capacity building, General transport institutional reform, Reporting, transparency, feedback mechanism, Transport law (Sub-sectors: Road transport)
Pakistan's First Biennial Update Report	2022	General transport institutional reform (Sub-sectors: Road transport)
Pakistan Updated NDC 2021	2021	Reference to finance mechanisms within country (Sub-sectors: Road transport, Rail transport, Domestic Navigation, Domestic Aviation)

Notes



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

<https://bit.ly/ATOpolicyrepository>

References

- (1) UN Population Database (2022), <https://population.un.org/wpp/>
- (2) World Bank (2022), <https://data.worldbank.org/>
- (3) Global Materials Flow Database (UNEP, 2023), <https://www.resourcepanel.org/global-material-flows-database>
- (4) Emissions Database for Global Atmospheric Research (EC, 2023), <https://edgar.jrc.ec.europa.eu/>
- (5) UN Energy Statistics (2021), <https://unstats.un.org/unsd/energystats/dataPortal/>
- (6) Fossil Fuels Consumption Subsidies 2022 (IEA, 2022), <https://www.iea.org/reports/fossil-fuels-consumption-subsidies-2022>
- (7) Climate Change Dashboard (IMF, 2024), <https://climatedata.imf.org/pages/access-data>
- (8) Ember (2023), <https://ember-climate.org/data-catalogue/yearly-electricity-data/>
- (9) Country Official Statistics
- (10) International Organization of Motor Vehicle Manufacturers (OICA, 2023), <https://www.oica.net/production-statistics/>
- (11) Trademap (ITC, 2024), <https://www.trademap.org/>
- (12) Koks, et al. (2019), <https://www.nature.com/articles/s41467-019-10442-3>
- (13) Coalition for Disaster Resilient Infrastructure (CDRI, 2023), <https://giri.unepgrid.ch/facts-figures/building-infrastructures>
- (14) Koks, et al. (2023), <https://iopscience.iop.org/article/10.1088/2634-4505/acd1aa>
- (15) Environmental Vulnerability Indicators (UN, 2018), <https://www.un.org/development/desa/dpad/least-developed-country-category/evi-indicators-ldc.html>
- (16) Rapid Transit Database (ITDP, 2022), <https://www.itdp.org/rapid-transit-database/>
- (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#>

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