

SECTOR ASSESSMENT (SUMMARY): TRANSPORT (ROAD TRANSPORT [NONURBAN])**Sector Road Map****1. Sector Performance, Problems, and Opportunities**

1. The road network of the state comprised 226,244 kilometers (km) as of 2014 and is described in Table 1.¹ All higher-class roads—national highways, state highways, and major district roads—are paved, but most rural roads are unpaved. The Road Construction Department (RCD) manages the national highways (except roads under the National Highway Authority of India), state highways, and major district roads. The Bihar Rural Roads Development Agency under the Department of Rural Works manages the rural roads. The road density in Bihar, at 1,748 km per million inhabitants, is well below the national average of 3,875 km per million inhabitants. However, during 2012–2013, in terms of road length per 100 square kilometers, Bihar has overtaken the national average—193 km against 143 km.

Table 1: Details of Road Network in Bihar

No.	Class of Road	Length (km)
1	National highway	4,320
2	State highway	4,389
3	Major district road	10,127
4	Rural road	207,406
Total length		226,244

km = kilometer.

Source: Government of Bihar, Finance Department. 2015. *Economic Survey, 2014–2015*.

2. The carriageway width of a road defines its carrying capacity. In Bihar, about 64% of the national highways have two or more lanes, while 27% have four or more lanes, and about 65% of state highways will have two or more lanes once the road upgrades under the *Rasthriya Sam Vikas Yojana* initiative (for about 2,114 kilometers) and the Asian Development Bank (ADB)-funded Bihar State Highways projects (about 1,466 km) are completed.² About 51% of major district roads (MDRs) are still single-lane; the rest are of intermediate-lane or higher-capacity standard. The state government is making endeavors to upgrade about 5,175 km of MDRs to a minimum standard of intermediate-lane width of 5.50 meters, so that only a small percentage of the MDRs will remain single-lane.

3. The number of motorized vehicles registered in the state has increased from 1.96 million in 2009 to 4.16 million in 2014, representing an average annual increase of 16.3%. Of these, 72.4% were two-wheelers, 9.4% were cars and jeeps, 2.5% were commercial trucks, 0.7% were buses and minibuses, and 10.2% were tractors and trailers. Average annual vehicle growth observed during 2009–2014 was 17.1% for two-wheelers, 15.1% for cars, 7.1% for buses, and 12.4% for trucks. These growth rates are much higher than those observed nationally, and in line with the economic growth of the state. The revenue from road transport has more than doubled between 2010 and 2014 (from Rs3,728 million to Rs8,342 million) indicating an annual growth rate of 22% during this period.

4. The road network in Bihar is inadequate both in terms of capacity and quality. The Ganges River bisects Bihar into a northern and southern part. Currently, only four bridges are operational along the entire length of the Ganges River in Bihar (approximately 200 km). This

¹ This summary is based on the Road Master Plan for Bihar's State Highway Development. Available on request.

² Government of Bihar, Finance Department. 2015. *Economic Survey, 2014–2015*. Patna.

inadequacy has become a major obstacle in the development of one of the most populous states of India. The construction of bridges across the Ganges River will promote the geographical integration of Bihar and will lead to social, economic, and industrial development of the area.

5. The state government has taken up the construction of roads and bridges on a large scale, in keeping with its resolution of connecting the state capital with the remotest areas for a maximum travel time of 6 hours. The Bihar Road Assets Maintenance Policy was enacted in 2013 and began to be implemented in 2014, and will ensure better maintenance of roads in the state. The policy has adopted the principle of long-term performance-based maintenance to achieve timely and sustainable maintenance and preservation of the road network assets.

6. The economy of Bihar has grown steadily from an average annual plan size of only Rs42.00 billion during the Tenth Five Year Plan, 2002–2007, to more than Rs2,284.52 billion during the Twelfth Five Year Plan, 2012–2017 (footnote 1). The plan expenditure has grown more than sixfold since fiscal year (FY) 2006. The share of plan expenditure in total state expenditure has also grown from 19% to 37%. Not only did public investment increase, the growth pattern also changed—the emphasis on developing infrastructure and service delivery in the social sector is considerable. The gap between the national and state per capita income ratios has begun to narrow. However, even at the present rate of high growth, it will take more than 25 years to catch up with the national average.

7. Public investments in roads are among the most effective ways of promoting agricultural growth and reducing poverty. This policy need and priority is already reflected in the growing role and importance of the RCD: its budget outlay has increased almost 40 times within a decade, from Rs1.33 billion in FY2005 to Rs52.00 billion in FY2015. Although Bihar has significantly improved its road density, constant upgrades and extension in terms of road length per square kilometer and road length per population of 100,000 are needed to sustain growth. Another major need is road connectivity across the Ganges River.

2. Government's Sector Strategy

8. The Government of Bihar, through RCD and Bihar State Road Development Corporation Limited (BSRDCL), has been improving the state highways and major district roads through a combination of budgetary support, ADB assistance, and public–private partnerships. The State Highways Development Program aims to widen all state highways to two lanes under the centrally funded *Rasthriya Sam Vikas Yojana* (Development and Reform Facility). Selected major district roads and bridges are being upgraded under the Rural Infrastructure Development Fund financed by National Bank for Agriculture and Rural Development. From FY2006 to FY2014, 213 major and small bridges were constructed under the state plan, and 61 bridges under the fund. The state government, through the *Mukhyamantri Setu Nirman Yojana* scheme, also aims to provide all-weather connectivity to remote rural areas. The primary objective of this program is to construct new bridges across rivers and drainage systems, and replace damaged and dilapidated ones. Additionally, about 550 km of roads close to Bihar's border with Nepal will be widened to two lanes, funded by the Ministry of Home Affairs. Table 2 summarizes the RCD's expenditures for road and bridge development works since 2010.

Table 2: Road and Bridge Expenditure, Road Construction Department
(Rs million)

Item	FY2011	FY2012	FY2013	FY2014	FY2015
Major roads	5,500	5,750	4,050	6,140	16,720
Bridges	2,850	3,930	2,180	4,510	6,080
<i>Mukhyamantri Setu Nirman Yojana</i>	3,970	3,780	1,610	2,920	3,520
Rural Infrastructure Development Fund bridge	6,690	4,020	7,920	11,430	12,150
<i>Rasthriya Sam Vikas Yojana</i>	7,620	6,080	4,420	2,150	0
ADB-funded projects	11,650	11,290	10,380	2,950	990
Indo-Nepalese border road	0	0	670	7,830	1,990
Others	2,220	2,980	1,810	2,930	4,930
Total	40,490	37,820	33,040	40,850	46,380

ADB = Asian Development Bank, FY = fiscal year.

Source: Road Construction Department.

A. Sector Institution Framework

9. BSRDCL was incorporated on 20 April 2009 under the Companies Act of 1956, and is a wholly owned company of the Government of Bihar, established to develop, execute, manage, and maintain all types of roads, highways, and bridges. The RCD is the parent department responsible for statewide construction and maintenance of roads and bridges and has engineering and executive functions. Under the project, BSRDCL will build the new Ganga Bridge and hand it over to the RCD upon completion.

B. Road Maintenance Financing and Operations

10. To meet the maintenance demands of an expanded road network in Bihar, the RCD's annual maintenance budget more than doubled from Rs3,500 million in FY2012 to Rs8,932 million in FY2015. Annual maintenance expenditure increased by 20.5% on average, from Rs3,275 million to Rs5,729 million in the same period. The entire RCD network of state highways and major district roads is being rehabilitated. Implementing best practices in maintenance management can preserve the assets while reducing the cost of maintenance. Road-user revenue, excluding commercial taxes, has been increasing at a high annual rate of 23.4%, from Rs4,441 million in FY2012 to Rs8,341 million in FY2015. Road-user revenue will substantially meet maintenance requirements in the long run. BSRDCL is preparing to implement an operate–maintain–transfer model with private sector participation to ensure the sustainable and timely maintenance of newly upgraded state highways. This will allow budgetary allocations to be used to maintain the rest of the state road network.

11. Maintenance of roads in the state will be further supported by the Bihar Road Assets Maintenance Policy (para. 5).

C. Road Safety

12. The road accident fatality rate in Bihar is much higher than the national average. In 2013, Bihar's rate of accidental deaths per 1,000 vehicles was 1.6 against the national average of 0.9. The absolute number of fatalities is likely to increase as traffic grows, having already increased from 4,390 in 2009 to 4,989 in 2013. BSRDCL is adopting good road design practices and incorporating road safety measures in projects under construction. Because many accidents are caused by unfamiliarity with traffic rules or disregard for them, the Transport Department organizes a road safety week every year for school children and the public to improve awareness

of traffic rules. A driver-training institute for all types of vehicles is being established with private participation in Aurangabad. State and district road safety councils will be created to provide guidance on road safety. Countering the rapid rise in road accident fatalities requires increased effort to improve awareness and place stronger emphasis on road safety measures in project implementation. The RCD plans to develop a road safety unit within its organization to institutionalize road safety audits and ensure that safety elements of the India Roads Congress standards are incorporated in design and construction.

D. Overloading

13. Overloading is a nationwide problem, and the number of multi-axle trailers is increasing. The number of overloaded trucks is expected to grow on major Bihar highways as the economy develops. Taking the problem of overloading seriously, the Transport Department has instructed its field offices to implement the rules strictly.

E. Vehicle Pollution Control

14. To reduce vehicle pollution, the state government has imposed a 10% “green tax” on commercial vehicles older than 12 years, and introduced in 2010 a 50% tax rebate for electric vehicles. In 2014, the state government introduced a one-time 7% tax on the vehicle cost to be levied at the time of registration for a period of 15 years. It has amended the Bihar Motor Vehicle Rules, 1992 to require all vehicles to undergo pollution checks and obtain a pollution control certificate. The private sector is being encouraged to put up pollution-checking centers, and over 120 such centers are now operational in Bihar.

3. ADB Sector Experience and Assistance Program

15. ADB has a substantial presence in Bihar’s road sector, with three previous loans to improve the state highways. Under the first loan in September 2008, significant sector reform was implemented, including establishing BSRDCL and adopting best practices for road planning and maintenance, financial management, and public procurement. Table 3 summarizes the previous ADB loans to the state’s road sector.

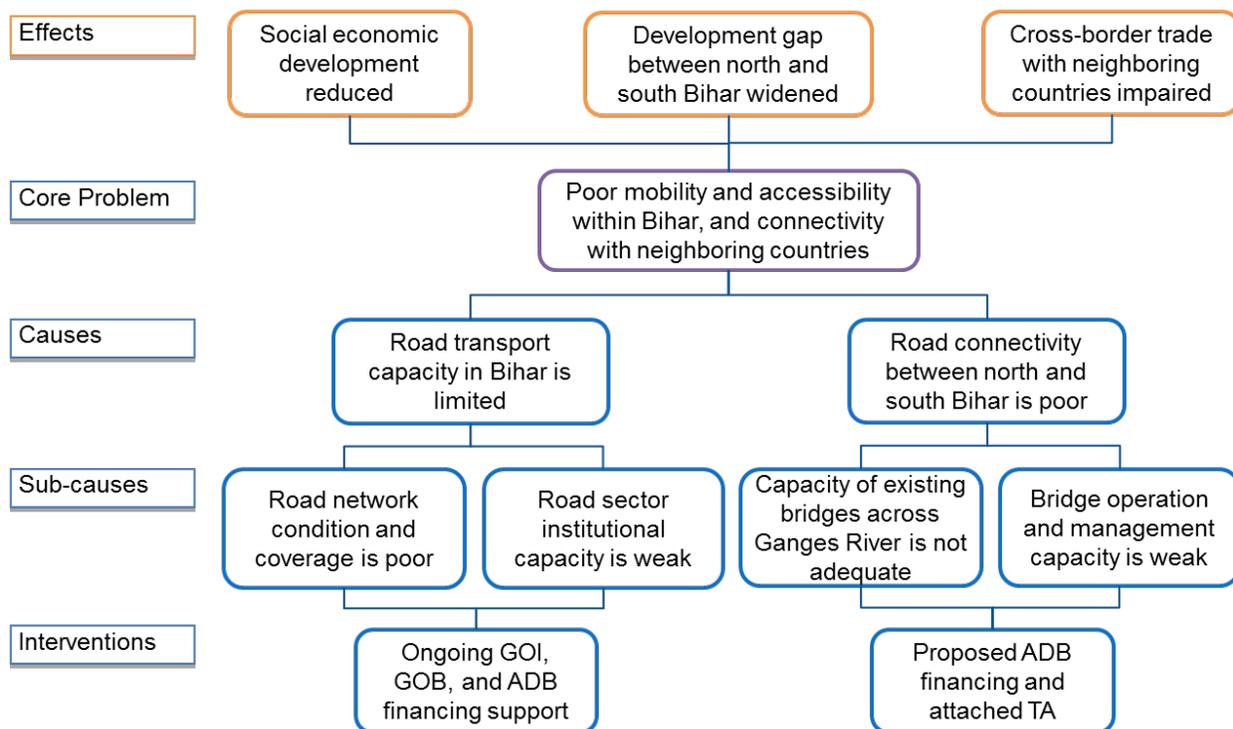
Table 3: ADB Assistance to the Government of Bihar in the Transport Sector

Loan	Length (km)	Amount (\$ million)	Status
Bihar State Highways Project (2443-IND)	824	420	Project completed
Bihar State Highways II Project (2663-IND)	387	300	Project in progress
Bihar State Highways II Project – Additional Financing (2894-IND)	255	300	Project in progress

km = kilometers.

Source: Asian Development Bank.

Problem Tree for Road Transport (non-urban)



ADB = Asian Development Bank, GOB = Government of Bihar, GOI = Government of India, TA = technical assistance.
Source: Asian Development Bank.

Sector Results Framework (Transport, 2013–2017)

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contribution	Indicators with Targets and Baselines	Outputs with ADB Contribution	Indicators with Incremental Targets	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Interventions
Increased movement of people and goods in a more efficient and sustainable manner	<p>(i) 100% of villages (population>1,000) have access to all-weather roads by 2017 (2000 baseline: 90%)</p> <p>(ii) Road freight ton-km reaches 1.8 trillion in 2016 (2011 baseline: 1.2 trillion)</p> <p>(iii) Road passenger-km reach 11.4 trillion in 2016 (2011 baseline: 7.4 trillion)</p>	Transport systems with safety and accessibility features for women, the elderly, people with disabilities, and children expanded, improved, and maintained	<p>(i) Additional 126,500 km of state roads built or upgraded by 2017 compared with 2012</p> <p>(ii) Additional 167,500 km of major district roads built or upgraded by 2017 compared with 2012</p> <p>(iii) Additional 242,181 km of rural roads built or upgraded by 2017 compared with 2012</p>	<p>(i) Planned key activity areas</p> <p>State roads (58% of funds)</p> <p>Rural roads (18% of funds)</p> <p>Railways (4% of funds)</p> <p>Urban transport (20% of funds)</p> <p>(ii) Pipeline projects with estimated amounts</p> <p>12 projects amounting to \$2,275 million for 2013–2015 (including two projects categorized as EGM)</p> <p>(iii) Ongoing projects with approved amounts</p> <p>15 ongoing loans amounting to \$3,262 million as of 31 December 2012 (including two projects categorized as EGM)</p>	<p>(i) Planned key activity areas</p> <p>(a) 4,700 km of state roads improved with pedestrian lanes, crossing points, and other safety features, including 150 km of subregional connectivity</p> <p>(b) 12,300 km of rural roads improved to include pedestrian lanes, crossing points, and other safety features</p> <p>(ii) Pipeline projects</p> <p>(a) 3,600 km of state roads improved with pedestrian lanes, crossing points, and other safety features, including 600 km of subregional connectivity</p> <p>(b) 6,000 km of rural roads improved to include pedestrian lanes, crossing points, and other safety features</p> <p>(iii) Ongoing projects</p> <p>(a) 9,000 km of state roads improved</p> <p>(b) 30,000 km of rural roads improved</p> <p>(c) Road corporations established in three states</p>

ADB = Asian Development Bank, EGM = effective gender mainstreaming, km = kilometer.

Source: Asian Development Bank. 2013. *Country Partnership Strategy: India, 2013–2017*. Manila.