



1. Project Data

Project ID P121185	Project Name Natl Highways Inter-Conn	
Country India	Practice Area(Lead) Transport	
L/C/TF Number(s) IBRD-83010	Closing Date (Original) 30-Jun-2019	Total Project Cost (USD) 307,735,919.46
Bank Approval Date 29-Oct-2013	Closing Date (Actual) 30-Sep-2020	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	500,000,000.00	0.00
Revised Commitment	307,735,919.46	0.00
Actual	307,735,919.46	0.00

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2. Project Objectives and Components

a. Objectives

According to the International Bank for Reconstruction and Development (IBRD) Loan Agreement (p.5) dated July 1, 2014 and the Project Appraisal Document (p.5) dated October 2, 2013, the project objective is “to improve the national highway network connectivity to less developed areas and low-income states and enhance the institutional capacity of the Ministry of Road Transport and Highways (MORTH) to better manage the highway network under the purview of MORTH.”



For the assessment of the project's outcome, the project objective is parsed as follows:

1. To improve the national highway network connectivity to less developed areas and low-income states; and
2. To enhance the institutional capacity of the MORTH to better manage the highway network under the purview of MORTH.

b. Were the project objectives/key associated outcome targets revised during implementation?

No

c. Will a split evaluation be undertaken?

No

d. Components

The project consisted of three components:

A. Road Improvement and Maintenance. (*Appraisal cost: US\$1,106.4 million; revised cost at the second restructuring: US\$1,001.71 million; actual cost: US\$704.0 million*). This component was to finance the widening and upgrading of approximately 1,120 kilometers (km) of single-lane national highways to two-lane standards through item-rate contracts (a type of contract in which the contractor agrees to carry out the work as per drawings and specifications in return for a payment based on multiplication of the units of work completed and the unit price the contractor tendered for that work) or Engineering-Procurement-Construction contracts (EPC – a type of contract in which the contractor designs the work, procures the necessary inputs and completes the construction in return for a fixed amount the contractor tendered) including maintenance of these roads for a period of at least five years after the completion of civil works. Additionally, this component was to finance quality control services and project implementation support for compliance with environmental and social safeguards. The project areas were three low-income states, i.e., Bihar, Odisha, and Rajasthan, and less developed regions in two middle-income states, i.e., Karnataka and West Bengal. The Public Work Departments (PWDs) of each state were to be involved in the implementation of these civil works along with MORTH.

B. Institutional Development. (*Appraisal cost: US\$20.90 million; actual cost: US\$14.30 million*).

This component was to finance the following technical assistance activities: (a) rolling out of enterprise resource planning (ERP) software solutions, developing manuals for roles and responsibilities between MORTH and project states regarding project implementation, and updating cost-databases, data-books, and reference materials for the road sector to improve MORTH's internal processes and procedures; (b) development and implementation of information technology (IT) based road assets in the entire non-National Highways Development Project (NHDP*) network and designing and piloting an asset management system (AMS) covering this network in at least three project states; (c) review of existing policies and practices for the financing of construction and maintenance works in the non-NHDP network to suggest improvements and assess the availability of options for additional resource mobilization; (d) implementation of Governance and Accountability Action Plan (GAAP) to strengthen MORTH's governance and accountability; and (e) training programs for MORTH and the project states' PWDs' staff on policy, technical, financial, procurement, and contract management issues related to the road sector.



C. Road Safety. (*Appraisal cost: US\$17.50 million; revised cost at the second restructuring: US\$72.50 million; actual cost: US\$3.20 million*)

This component was to finance the following technical assistance activities: (a) review and update of road safety standards and codes of practices maintained by the Indian Roads Congress (a technical body of highway engineers)—including mainstreaming the implementation of road safety standards into MORTH's contract management framework—and vehicle axle-load codes and institutional arrangements for monitoring and enforcement; (b) establishment of road accident database management systems in each project state; (c) assessment and improvement of the existing road safety policy framework, development of models for enforcement, mainstreaming of road safety monitoring and evaluation systems, carrying out public awareness campaigns to promote road safety behavioral change, and establishment of lead road safety and traffic management agencies to strengthen MORTH's institutional capacity in road safety; and (d) road safety training program for MORTH and PWDs staff.

* NHDP is a government funded initiative, which started in 1998, with the objective to reduce traffic congestion and vehicle operation costs and improve road safety through a combination of investments and better management practices. Roads connecting state capitals and key economic areas were included in the NHDP, which was later became the Bharatmala program (ICR, p.5). Non-NHDP roads constitute 43 percent of the primary highway network in India.

Revised Components

At the second restructuring, funds were reallocated to the Road Safety component for MORTH to pilot safety enforcement mechanism in about 1,200 km of highways in addition to the technical assistance activities to be financed under that component. Accordingly, the estimated cost of the third component was revised from US\$17.50 million to US\$72.50 million.

The technical assistance activities that were to be implemented under the project, i.e., development of standard manuals with clear delineation of roles, responsibilities, and process interface between the MORTH and state PWDs, development of an Asset Management System, and studies for assessing options for mobilization of additional finances for road construction and maintenance, were financed under the National Highways Authority of India Technical Assistance Loan (NHAI-TA, P121515). The government requested this change as it was determined that MORTH was the agency directly involved in these activities and best suited to carry them out under the NHAI-TA. The NHAI is an agency under the MORTH. This financing-source change was not reported in any of the project restructuring papers as a revision to the project.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Cost: The total project cost was originally estimated at US\$1,146.05 million including US\$1.25 million as front-end fee. On September 30, 2020, the project closed with a total cost of US\$721.50 million. The widening and upgrading of 463 km of roads in Bihar and Odisha, out of a total of 1,071 km, could not be completed because of contractors' cash-flow challenges, heavy flooding in the 2019 monsoon season, and restrictions caused by the onset of COVID-19 pandemic. Those works were transferred to the World Bank-financed Green National Highway Corridor Project (P167350); hence, the actual project cost was lower than the project cost estimated at appraisal.



Financing: At appraisal, the IBRD loan was estimated at US\$500.00 million. By project closing in September 2020, the project had disbursed US\$307.70 million. A total of US\$192.16 million was cancelled in three restructurings (see Restructuring entries below).

Borrower's contribution: At appraisal, the borrower's contribution was estimated at US\$646.05 million. At project closing, the borrower's contribution was estimated at US\$413.76 million.

Restructurings: The project was restructured four times:

- **First Restructuring (Level 2 – June 6, 2014):** The loan agreement was revised to allow retroactive financing of eligible expenditures.
- **Second Restructuring (Level 2 – April 29, 2019):** The project closing date was extended by 12 months from June 30, 2019 to June 30, 2020 to allow time for the completion of the road works in Odisha and Bihar under the EPC contracts that were delayed because of the contractors' cash-flow challenges. Loan savings of US\$49.9 million, because of the depreciation of the Indian rupee against the US dollar and lower estimated costs that did not require the use of the amount for price contingency, were cancelled. A loan amount of US\$54.70 million was reallocated from the Road Improvement and Maintenance Component to the Road Safety Component to pilot safety enforcement mechanism (see Revised Components above).
- **Third Restructuring (Level 2 – June 30, 2020):** The project closing date was extended by an additional three months from June 30, 2020, to September 30, 2020, to allow the completion of as many civil works and technical assistance as possible before deciding which pending project activities would be transferred to the Green National Highways Corridor Project (P167350). An undisbursed loan amount of US\$113.74 million was cancelled because of the incompleteness of road works in Bihar and Odisha due to cash problems and insolvency issues of the contractors.
- **Fourth Restructuring (September 29, 2020):** An additional US\$29.43 millions of undisbursed loans were cancelled. The pending project activities were transferred to the Green National Highways Corridor Project—the widening and upgrading of 463 km of roads in Bihar and Odisha.

Dates: The project was approved on October 29, 2013. The Loan Agreement was signed on July 1, 2014. The loan became effective on August 5, 2014. The Mid-Term Review was conducted in May 2017. The original project closing date was June 30, 2019, but it was extended by 15 months, and the project closed on September 30, 2020. The reasons for project closing date extensions are given in the first and second restructuring entries above.

3. Relevance of Objectives

Rationale

At closure, the project objectives were highly aligned with the World Bank's strategy as defined in the Country Partnership Framework (CPF) for India, Fiscal Years 2018-2022. The project sought to address the development problem of insufficient transport connectivity of undeserved and economically lagging regions to economic opportunities and social services for equitable and inclusive growth. The World Bank's 2018 Systematic Country Diagnostic (SCD) for India identified the improvement of road connectivity as a priority that would be expected to lead to higher incomes, more occupational choices, and increased female



entrepreneurship and improved educational and health outcomes. The project was to address this problem through the physical widening and upgrading of non-NHDP roads in less developed areas and low-income states resulting in improved connectivity while strengthening the institutional capacity of MORTH to better manage the roads for the sustainability of the development outcomes. The project objectives correspond to the CPF's "Objective 1.1: Promote more resource-efficient, inclusive, and diversified growth in the rural sector" under "Focus Area 1: Resource Efficient Growth" and "Objective 2.3: Improve connectivity and logistics" under "Focus Area 2: Enhancing Competitiveness and Enabling Job Creation" (CPF, pp.41 and 61).

The project objectives remain substantially relevant to the country context. They support the achievement of the Bharatmala program objective to provide connectivity to the remote borders and rural areas to reduce logistics costs and provide green and safe transport (ICR, p.10). The project objectives are also aligned with the objectives of the National Infrastructure Pipeline 2020-25 to enhance road connectivity to remote areas through the expansion of the highway network. However, while the project objective was appropriately pitched for the development status and capacity in the country as described in the CPF, the expected results from project's intervention were more in the form of intermediate-outcomes rather than outcomes. The expected outcomes from improved road connectivity and enhanced institutional capacity of MORTH are not defined. The results are defined as reduced vehicle operating costs and travel time. These results are direct outputs of project activities assuming all factors remain the same such as fuel prices. The decrease in the number of fatalities in road accidents is an outcome of the project's outputs; however, this outcome is not captured in the project objective. Overall, while the project objectives remained relevant throughout the project cycle and were a necessary response to a development gap in India, the lack of clarity in the project objective formulation around what outcomes would be achieved through improved road connectivity and enhanced institutional capacity was a significant gap. The causal chain between funding and outcomes related to improved road connectivity was clear, albeit with most targets being at output level, as the objective was closer to the output level, rather than the outcome level.

The project was the World Bank's first engagement with MORTH for more than 15 years. However, the World Bank has continued to be an important development partner of India in road network development, both highways and rural road networks, since mid-1990s. Despite this long engagement, the project objectives were not more challenging compared to the previous road projects in India. For example, recently closed India Pradhan Mantri Gram Sadak Yojana (PMGSY) Rural Roads Project had a more challenging objective: "To support the strengthening of the systems and processes of the PMGSY program for the expansion and maintenance of all-season rural access roads, resulting in enhanced road connectivity, and better economic opportunities and social services for beneficiary communities in the participating states." The project objectives were formulated as improved road access and institutional capacity building objectives with expected results being closer to the output-level.

Overall, the relevance of project objectives is rated **Substantial**.

Rating

Substantial

4. Achievement of Objectives (Efficacy)



OBJECTIVE 1

Objective

To improve the National Highway network connectivity to less developed areas and low-income states.

Rationale

Theory of Change for Objective 1. The project's input - the IBRD loan - would finance activities such as civil works for the widening and upgrading of the selected national highways, and implementation of road safety capacity building activities, such as updating of standards and mainstreaming the implementation of road safety measures. The expected outputs were improved road conditions, such as wider roads and better pavement. These outputs were expected to lead to outcomes such as reduced vehicle operating costs defined as lower vehicle service costs and fuel costs, and reduced travel time; hence, achieving the project objective to improve road network connectivity in project areas. These results are direct outputs of project activities and are not outcomes. (The project documents do not define "connectivity." IEG interprets "connectivity" as the ability of people to connect by road to their destinations.) Sustainability of these outcomes were to be achieved through five-year road maintenance requirements to be included in the construction contracts. The causal pathways from inputs to outcomes were valid and direct, and the achievement of the stated outcomes and project objectives could be attributed to the project's intervention assuming that other important factors that affect travel costs do not change, such as fuel prices and vehicle service costs.

Outputs

- **Roads constructed, non-rural.** The target was to widen and upgrade approximately 1,200 km of roads. During implementation, the target was revised to 1,071 km after changes in road network alignments, but this revision was not officially reflected in the results framework in any of the four project restructurings. At project closing, 8 civil works contracts out of 15 were completed. This corresponds to 621 km of roads. Including the roads completed under the ongoing other seven contracts, the total achievement at project closing was 916 km. The three contracts in Bihar were significantly delayed because of "liquidity problems faced by some contractors due to the limited availability of financing from national banks, extensive flooding in Bihar during the 2019 monsoon season, and the impact of COVID-19 restrictions" (Implementation Status and Results Report, No:14, p.5). Almost all unfinished roads were contracted under EPC contracts (154 km out of 155 km unfinished roads). At the time of project evaluation in March 2022, the achievement was reported as 1,018 km including 102 km of unfinished roads that were later transferred to and completed under the World Bank-financed Green National Highways Corridor Project (GNHCP). The pending 53 km of road works are expected to be completed under the GHNCP by the end of 2022. In their email dated January 18, 2023, the project team stated that 35 km of the road works had already been completed but works on 18 km of roads were still pending because of slow progress.
- **Roads in good and fair condition as a share of total classified roads.** The baseline value was 65 percent of 37,501 km of classified road, i.e., 24,376 km of roads were in good and fair condition. The target was to increase the share of roads in good and fair condition by around 1,200 km (3.25 percent) to 25,596 km (68.25 percent). The achievement is reported as 72.80 percent, but the size of the total classified road network increased to 87,995 km. Therefore, the achievement cannot be fully attributed to the project's intervention. Furthermore, only 916 km of roads out of 1,071 km financed under the project were completed by project closing. Therefore, the achievement of the project, i.e., 916 km at



project completion, was lower than the updated target value of 1,071 km of addition of roads in good and fair conditions. In their email dated January 18, 2023, the project team stated that the Indian Road Congress roughness index criteria were used to categorize the road conditions.

- **Improved accident data management system in selected states.** The target was to establish improved data management systems in at least three states. The achievement was 21 states, but evidence is insufficient to establish attribution between the project activities and the achievement of this output. According to the borrower's project completion report, 116,837 officials from various government departments were trained at 18,421 road safety trainings (ICR, p.31).
- **Project roads subject to Road Safety Audits.** All project roads were audited for road safety as planned.
- At the second project restructuring, the estimated cost of the Road Safety component was increased from US\$17.50 million to US\$72.50 million to pilot safety enforcement mechanism in the roads upgraded under the project. The ICR does not provide information about the implementation of this activity. Given that the actual cost of this component was only US\$3.20 million, this review concludes that safety enforcement mechanism in the project roads was not piloted.

Outcomes

- **Reduced average Vehicle Operating Cost (VOC) per kilometer on project roads.** The baseline value was Indian rupee 8 per km for cars and Indian rupee 14 per km for trucks. The achievements were Indian rupee 7.2 per km for cars and Indian rupee 12.6 per km for trucks as targeted but the evidence is insufficient whether this exact achievement of the target values was triangulated with other data or not.
- **Reduced average travel time per kilometer on project roads.** The baseline value was 2 minutes per km for cars and 3 minutes per km for trucks. The achievements were 1.17 minutes per km for cars and 1.7 minutes per km for trucks, which were better than the target values of 1.5 minutes per km and 2.4 minutes per km, respectively.
- **No increase in fatalities on project roads.** The baseline for this indicator was 163 fatalities recorded in 2009. The achievement was a 45 percent reduction in fatalities, which was significantly better than the target of no increase in fatalities. The achievement of no fatality is related to the roads that were upgraded by the project under Component 1. Because of upgrading of those roads, road safety had improved. The achievement, therefore, is attributable to the project activities.
- **Increase in Road User Satisfaction (on a scale of 0 to 5 on project roads).** The baseline value for satisfaction rate was 2.5. The ICR does not report the road user satisfaction rate at project closing. In their email dated January 18, 2023, the project team confirmed that a separate survey was not conducted at project closing.
- The ICR reports (p.11) that at the time of project evaluation the roads were being maintained adequately, and the contractors had been regularly delivering monthly and quarterly maintenance reports to the Project Implementation Units at the state level and MORTH.

The ICR does not provide information about how a road is classified as having good and fair road conditions. The results framework does not include an indicator monitoring the improvement of road conditions according to the International Roughness Index (IRI) before and after the project's intervention. However, the PAD (p.59) defines an index value of nine per meter or roads under the IRI as the threshold above which routine maintenance should be applied to the road. Therefore, it could be indirectly inferred that all roads completed by project closing date had an IRI of less than 9 per meter at project closing—a low IRI means good road



conditions. In their email dated January 18, 2023, the project team stated that the Indian Road Congress roughness index criteria were used to categorize the road conditions.

With the majority of the planned road works completed under the project upgrading i.e., the roads from single lane to two lanes in each direction, the population in the project areas now have improved access to higher capacity roads. While the reductions in vehicle operating costs and travel time for both cars and trucks are not sufficient to fully capture the improvement in the connectivity of people by roads, they nevertheless show that people can now reach their destinations more efficiently than prior to the project, improving their connectivity. Improved connectivity is expected to result in improved access to health services, schools, and markets; hence, improved socio-economic welfare. However, the ICR does not report on these socio-economic benefits, which were not captured by the project objectives, nor provides the number of beneficiaries from improved connectivity.

Overall, the project's efficacy in achieving the project objective to improve the National Highway network connectivity to less developed areas and low-income states is rated Substantial.

Rating

Substantial

OBJECTIVE 2

Objective

To enhance the institutional capacity of MORTH to better manage the highway network under the purview of the Ministry.

Rationale

Theory of Change for Objective 2. The project's input - IBRD loan for technical assistance - would finance consultancy services, training, IT equipment and software, and equipment under the second component to strengthen the institutional capacity of MORTH. The expected outputs were as follows: (a) an Enterprise Resource Planning (ERP) manual for Work Execution Delegation Framework developed, and cost-databases and data book for analysis of rates of items work upgraded; (b) an IT-based Road Information System and a comprehensive road Asset Management System (AMS) developed; (c) studies completed on the financing, management and governance of the road sector; and (d) the Governance and Accountability Action Plan (GAAP) implemented.

According to the Loan Agreement (p.5), these outputs were to lead to (in the same order of the outputs listed above) improved internal processes and procedures of MORTH, improved road asset management, improvements suggested and options' availability assessed for financing construction and maintenance works, and MORTH's governance and accountability strengthened. Additionally, the project was to finance technical assistance activities under the third component in road safety. The expected outputs were the implementation of road safety standards mainstreamed into MORTH's contract management framework, existing road safety policy framework assessed and improved, enforcement models developed, road safety monitoring and evaluation systems mainstreamed, and MORTH's and other related institutions staff trained in road safety. These outputs were expected to strengthen MORTH's institutional capacity in road safety. The PAD (p. 27) states that most of these activities—specifically the ones under the second component—were primarily aimed at improving the MORTH's functioning vis-à-vis the subproject roads but were expected to



have substantive spillover effect in terms of dissemination of best practice guidance into the Ministry's management of the remainder of the non-NHDP network.

The results achieved from the implementation of activities under the second and third components were expected to enhance the institutional capacity of MORTH so that the ministry could better manage the highway network under its purview. The results chain was broadly valid, but the outcomes expected from the achievement of the outputs were not clearly defined. For example, the development of an ERP would be expected to result in the improvement of MORTH's internal processes and procedures, but it was not explained how this would be achieved. Similarly, the explanation was insufficient how the development of an AMS would lead to improved road management capacity. Furthermore, the PAD did not explain how the strengthening of MORTH's institutional capacity would result in its better management of highways. The project's theory of change as inferred from the PAD does not sufficiently explain what barriers the project was to address so that MORTH's highway network management would improve. Overall, the theory of change was broadly valid but there were gaps in the causal pathways.

Outputs

- **Asset Management System developed and implemented for the non-NHDP network in the states.** The target was to implement asset management systems in at least three states. As of project closing, asset management system was developed by National Highways Authority of India (NHAI) under the NHAI Technical Assistance Loan (NHAI-TA, P121515). The financing of this activity under NHAI-TA was requested by the government as it was argued that MORTH was "the agency directly involved in the tasks associated" with this and two studies (see below) and "best suited to carry them out under the NHAI-TA" (ICR, p14).
- **Work Execution-Delegation Framework developed and implemented.** The project financed a study that was used by MORTH to develop manuals financed-under the NHAI-TA for delineation of the roles, responsibilities, and process interface between MORTH and state PWDs. Hence, a work execution-delegation framework was developed but it was yet to be implemented at the time of project evaluation.
- **Improved design standards and Indian Roads Congress (IRC) codes.** The project targeted to finalize three design standards and IRC codes related to road safety. The achievement was only one standard; the IRC published the Manual on Road Safety Audit in 2019.

The ICR (p.13) reports the following outputs that were not captured by the results framework:

- An enterprise resource program software for MORTH was developed and installed.
- Cost-database and data books for the road sector were updated.
- A study was conducted under the NHAI-TA for the review of policies and practices for the financing of road construction and maintenance works with suggestions for mobilization of additional finances.
- A Governance and Accountability Action Plan (GAAP) was prepared.

Additionally, the ICR (p.14) reports the following road safety outputs related to enhancing MORTH's operational efficiency. These outputs were not captured by the results framework:

- Workshops were held for the discussion of road safety, and an Integrated Road Accident Database (IRAD) was developed.



- The Motor Vehicles Amendment Act included a provision for the establishment of a National Road Safety Board, one of the goals of the project. In their email dated January 18, 2023, the project team stated that “MORTH has issued notification of the constitution of the NRSB together with operating rules on September 3, 2021. The selection of Board members is in progress.”
- 116 engineers were certified as road safety auditors and over 5,500 officials and practitioners were trained in road safety.
- 24 institutions were identified as potential center of excellence in road safety.

Outcomes

- **Roads in good and fair condition as a share of total classified roads.** The ICR (p.12) states that this “indicator captures the combined impact of aspects such as road planning, budgeting, and management; an asset management system; coordination and monitoring; contracting reforms and policies; road safety; and procurement due diligence, all of which represent the improvement in, and effectiveness of, institutional capacity, resulting in roads in good and fair condition.” However, the improved conditions of the roads at the time of project closing and the project evaluation is a result of the construction works and the maintenance of the roads included in the civil works contracts. As explained in the theory of change, the weaknesses in the institutional capacity of MORTH in managing the highway network were not sufficiently identified at appraisal. Hence, outcomes that should be expected to enhance the institutional capacity of MORTH are unknown. Therefore, this indicator is insufficient to capture the achievement of the Objective 2 (for the achievements under this indicator, see Outputs in Objective 1 section).

The ICR (p.13 and 14) reports the following improvements as a result of the technical assistance support under this project and the NHAI-TA. These improvements are not captured by the results framework.

- As a result of the development and installation of the ERP, the MORTH transitioned “from paper-based procedures to more robust and responsive real-time information management systems.” As a result of the ERP, the MORTH and its agencies, i.e., NHAI and National Highways and Infrastructure Development Corporation Ltd. (NHIDCL), are now connected through a single technology.
- The subsidiary agencies of MORTH currently use the cost-database and data book developed under the project to generate cost estimates and analyze rate schedules for all projects. The cost-database is used in MORTH projects in India.
- All data related to the 85,955 km of non-NHDP network are uploaded to the Asset Management System developed under the NHAI-TA. These data are now easily accessible to MORTH.
- A senior working group at MORTH used the suggestions of a study financed under the project for mobilization of additional finances. These suggestions included increased allocation and mobilization of resources and improved efficiency in the allocation of resources. However, the outcomes from the utilization of the study’s recommendations are unknown.
- Under the GAAP, electronic procurement was used for project works, procurement plans were monitored, and project related information and documents were disclosed.
- The Manual on Road Safety Audit is currently used in several states with the aim to ensure that road safety is adequately incorporated in road designs.
- The Integrated Road Accident Database is expected to enable harmonized and uniform crash data collection and its integration with vehicle registration, driver licensing, and police and health data systems. The database is currently active in 12 states including the project states of Karnataka,



Odisha, and Rajasthan. The available of such data is expected to enable MORTH to optimize its highway safety investments through improved identification of crash locations and risk factors.

- The National Road Safety Board is not operational yet. Once the Board is operationalized, it will advise central and state governments on all road safety aspects.

The project financed some of the technical assistance activities and some others were completed under NHAI-TA. The implementation of ERP is expected to improve the operational efficiency of MORTH and its agencies resulting in better project planning and implementation, including construction and rehabilitation. and faster decision-making processes. Implementation of AMS should significantly help MORTH better manage the highways under its purview assuming that the data system efficiently used and regularly updated. However, some important results could not be achieved. The work execution-delegation framework, which delineates roles, responsibilities, and process interface between MORTH and state PWDs is not implemented. The National Road Safety Board is not operational yet, and only one road safety standard was developed against the target of three.

Furthermore, the evidence is insufficient to validate that the achievements as a result of technical assistance activities enhanced the institutional capacity of MORTH and that this led to its better management of highways under its purview. All the achievements are at the output level. Outcomes that should be expected as a result of these outputs are not sufficiently identified, and the indicators in the results framework did not capture the achievement of this objective.

Overall, the project's efficacy in achieving the project objective to enhance the institutional capacity of MORTH to better manage the highway network under the purview of the ministry is rated Modest.

Rating
Modest

OVERALL EFFICACY

Rationale

While the road investments faced serious implementation problems under five contracts in the states of Bihar and Rajasthan because of contractors' financial challenges, the project was substantially successful in completing the majority of the road works and achieving the target values of the related indicators. Therefore, the project's efficacy in achieving the first objective to improve the national highway network connectivity to less developed areas and low-income states is rated Substantial. However, the project's efficacy in achieving the second objective to enhance the institutional capacity of MORTH to better manage the highway network under the purview of the Ministry is rated Modest because of underachievement of the related outputs, insufficient identification of outcomes, and insufficient evidence for improved highway management. With two efficacy ratings of Substantial and Modest, this review rates the project's overall efficacy as Substantial by taking into consideration the overall performance of the project and its significant potential impact on remote populations in less developed and low-income states.



Overall Efficacy Rating

Substantial

5. Efficiency

Economic Analysis

At appraisal, a “with project” and “without project” economic analysis was conducted (PAD, p.53-63). The benefits resulting from the upgrading of the 1,200 km single-lane roads to two-lane roads were defined as the savings in vehicle operating costs, maintenance costs, and travel time costs. Costs were defined as construction and maintenance costs. The methodology used in the cost-benefit analysis was robust; the World Bank’s Highway Development and Management Model (HDM-4), “a globally accepted key analytical tool for economic analysis of highways” was used to conduct the analysis (PAD, p.52). The calculations resulted in an average Economic Internal Rate of Return (EIRR) of 25.74 percent with EIRR varying from 13.61 percent to 41.9 percent for the 11 road sub-projects that were to be financed under the project. The Net Present Value (NPV) calculated at a discount rate of 12 percent was US\$727.63 million. The analysis period was 20 years.

At the time of project evaluation, an economic analysis was conducted for the eight upgraded road sections totaling 617.3 km replicating the analysis conducted at appraisal with actual data. The average EIRR was calculated at 20.3 percent varying from 10.00 percent to 31.30 percent for the eight road sub-projects financed under the project and the NPV at U\$240 million. The ICR (p.15 and 38) lists the main reasons for a lower after-project EIRR as delays in contract awards, delays in contract implementation including the impact of COVID-19 pandemic, lower traffic volumes, and increased contract costs.

Administrative and Operational Efficiency

The project closing date was extended by 15 months because of implementation delays including issues with land acquisition, difficulties arising from large geographical project area, low project implementation capacities of the project states, poor performance of the contractors, and COVID-19 pandemic restrictions. There were significant issues with staffing at the MORTH and project implementation units (PIUs) at the state levels; these included frequent staff transfers, non-availability of officials or officials not being able to devote sufficient time and attention to project implementation. This led to delays in decision making on topics such as time extensions, costs and variations, and the application of delay remedies. A lack of clarity among the MORTH and PIUs about the coordination and implementation of land acquisition led to implementation delays. The land availability was guaranteed by each Public Works Department of the project states before the project start, but not all land was handed over for construction even after the loan effectiveness. Some of the contracting companies faced serious insolvency issues and could not complete civil works within the project implementation period. There were shortcomings in the contract management related to these works that required significant attention such as timely issuance of contractual notices for slow progress, levy of liquidated damages, and recovery of advances as per contractual deadlines. The delays in the implementation of these works were partially addressed by allowing subcontractors to continue with the works. But 155 km of civil works were unfinished by project closing and transferred to the World Bank-financed Green National Highway Corridor Project for completion. The quality of some of the consultants hired under the project was insufficient, which required extra effort from the MORTH



and the World Bank project team in supporting these consultants to produce the outputs required under their terms of reference.

Overall, the project’s efficiency is rated **Modest** because of lower than estimated EIRRs and significant shortcomings in administrative and operational efficiency.

Efficiency Rating

Modest

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	25.74	97.00 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	20.30	98.00 <input type="checkbox"/> Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

While the project objective was output-oriented rather than outcome-oriented, the project addressed an important development problem in remote and low-income states of India, and the project objective was aligned with the World Bank strategy and the country context. Therefore, the relevance of project objectives is rated Substantial. The project’s efficacy in achieving the first objective to improve the national highway connectivity to less-developed areas and low-income states is rated Substantial. However, the project’s efficacy in achieving the project objective to enhance the institutional capacity of MORTH to better manage the highway network under its purview is rated Modest because the outcomes expected from the technical assistance activities that would support the achievement of this objective are not identified; furthermore, the evidence is insufficient to assess whether MORTH manages the highway network better compared to the situation before the project’s intervention. The overall efficacy is rated Substantial taking into consideration the impact of the project on remote populations in low-income states. Lastly, the efficiency of the project in achieving the project objectives is rated Modest because of lower-than-expected economic rates of return and significant shortcomings in the operational and administrative efficiency of the project. Overall, the project’s outcome is rated **Moderately Satisfactory**.

a. Outcome Rating

Moderately Satisfactory

7. Risk to Development Outcome



Sustainability of upgraded roads. The maintenance of the roads for a period of five years following the completion of civil works is included in the contracts. Therefore, short-term sustainability of the roads does not stand out as a risk. However, the roles and responsibilities of the MORTH and states' PWDs regarding the operation and maintenance of these roads has not been delineated, yet. The Work Executive-Delegation framework that was supported under the project was not completed by project closing. If this framework is not implemented, it is highly likely that issues will continue to emerge between the MORTH and PWDs resulting in dysfunctionality vis-à-vis the medium and long-term operation and maintenance of the roads.

Flooding. Some states, like Bihar, are subject to severe rainfalls during monsoon seasons. In 2019, rains resulted in extensive flooding in the state slowing down project implementation and causing damage to civil works. Unless roads are maintained adequately and drainage systems are kept functioning, heavy rains during monsoon seasons can severely damage the roads upgraded under the project weakening the remote communities' road connectivity.

8. Assessment of Bank Performance

a. Quality-at-Entry

The improved road connectivity of remote, economically lagging or other challenging regions that are only accessible by roads was of strategic importance for the Government of India to achieve its objective of equitable and inclusive growth (PAD, p.2). The project's approach to upgrade single-lane roads to two-lane roads that was to improve the road connectivity of remote areas was straightforward, but the project design was complex as the project investments were to be implemented in five different geographically distant states with diverse social and socioeconomic environments (ICR, p.18). Additionally, the project's approach to achieve the second objective to enhance the institutional capacity of MORTH to better manage the highway network under its purview was insufficient. The outcomes expected from the technical assistance activities to achieve this objective were not adequately identified. The M&E design had significant shortcomings in capturing the achievement of the second objective (see section 9.a. M&E Design below). The activities to be financed under the third component were designed to address the chronic safety issues, and they constituted a necessary response to an important development problem, but the outcome of those activities did not fully support the achievement of the project objectives.

The project's implementation readiness was high for some sections. The road sections to be upgraded under the project were selected based on the government's Readiness Criteria covering technical, economic, social and environmental aspects of the projects and completed statutory clearances. This led to early procurement of the contracts for these road sections and early completion of civil works.

The fiduciary and environmental aspects and implementation arrangements of the project were adequate. A detailed economic analysis was conducted and included in the PAD. Technical aspects of the project benefited from the experience gained and lessons learned in the World Bank-financed road projects in India, such as the promotion of Engineering, Procurement, and Construction (EPC) contracts to reduce overlapping responsibilities, delays, and cost overruns by shifting the design and construction controls and risks to the contractors. This new contracting method required advance preparation of procurement documents as the World Bank did not have a standard bidding document for this type of contract, but it was innovative in road construction in India, and its successful implementation resulted in its



mainstreaming in national road investments in the country. Most of the risks were adequately identified and mitigation measures were in place, but the risk related to the insolvency of contractors was overlooked. This led to implementation delays and consequently unfinished road works were transferred to Green National Highway Corridor Project.

Overall, the quality-at-entry is rated **Moderately Satisfactory**.

Quality-at-Entry Rating Moderately Satisfactory

b. Quality of supervision

The World Bank project team conducted two supervision missions per year until the onset of COVID-19 pandemic after which missions were held virtually. The project team also carried out interim missions and regularly visited project sites spread over a geographically wide area to verify quality of work. The project team's focus on the development impact of the road upgrading works was adequate; the project team supported the MORTH and PIUs in addressing issues related to project implementation through action plans including compliance with safeguards and fiduciary requirements. In order to overcome the impasse in five road works in Bihar and Rajasthan because of EPC contractors' cash challenges, the project team facilitated the use of subcontractors instead that resulted in the resumption of civil works. While EPC contracts are a more efficient contract type compared to traditional item rate contracts, if the former is not effectively managed, it might cause implementation delays and cost overruns. Contractors' solvency hampered project implementation, and some works could not be completed before project closing. The project team also facilitated the revision of road designs to avoid bypasses that delayed project implementation because land acquisition was required for the construction. These implementation delays in road works required more attention from the project team resulting in less focus on the development impact of the technical assistance activities in strengthening the MORTH's institutional capacity and improving road safety. Furthermore, the project was restructured four times, but these restructurings did not include the revision of the project objective to adequately capture the outcomes of the road safety activities implemented under the project. A mid-term review (MTR) was held between April 9 and May 12, 2017. Issues identified during the MTR were addressed by the respective state PIUs, such as staffing shortages, weak contract management, delays in the procurement of the road component, and processing of compensations for resettlement and payments for rehabilitations.

The project team's supervision of the fiduciary and safeguards aspects of the project was partly sufficient; the team showed extra effort to ensure that the MORTH and PIUs implemented the project in compliance with the fiduciary and safeguards requirements, but some issues had not been addressed by the PIUs by project closing such as issues with health and safety conditions at project sites and internal audits (see section 10. Other issues below). To address the project implementation challenges and provide guidance, the project team organized workshops covering project implementation, safeguards implementation, financial management and procurement. The performance reporting in Aide Memoirs and Implementation Status and Result Reports were candid and provided a comprehensive overview of project progress including critical issues and actions to be taken to address them; however, some reports, especially interim ones, did not adequately provide information about progress in project implementation or issues related to



safeguards implementation and financial management. Disbursement of around US\$114 million from the project funds was not possible before project closing and cancelled.

Overall, the quality of supervision is rated **Moderately Satisfactory**.

Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The theory of change for the first objective was sound and broadly reflected in the results framework. However, there were gaps in the theory of change for the second objective; the outcomes of the technical assistance activities in enhancing MORTH's institutional capacity that would lead to its better management of national roads were not adequately identified, and the theory of change for Objective 2 was not sufficiently reflected in the results framework. The project objective's formulation was simple and similar to the project objectives of other World Bank-financed road projects, but the development outcomes from increased road connectivity were not adequately captured. As the ICR (p.19) reports the five outcome indicators related to Objective 1 were of "limited use in understanding the development impact" of the road upgrading works. The results framework did not include an indicator to capture the achievement of the second objective. The indicator used for that purpose was insufficient, i.e., roads in good and fair condition. The intermediate indicators were sufficient to capture the project outputs. They were specific, measurable, relevant and timebound. However, the results framework had significant shortcomings in capturing the outputs of the technical assistance activities. The M&E arrangements were sufficient; the PIUs were to be in charge of M&E supported by supervision consultants. Additionally, independent inter-disciplinary performance auditors were to be hired as Third-Party Performance Monitoring and Auditing to supervise project progress including M&E.

b. M&E Implementation

The indicators in the results framework were measured adequately; the MORTH, PIUs, and the supervision consultants systemically collected, analyzed, and reported M&E data (ICR, p.20). The baselines were defined for indicators where relevant. The reliability and quality of data were ensured through third party monitoring. However, the shortcomings in the results framework in adequately capturing the project outcomes were not addressed. Those shortcomings continued through to project closing. The M&E functions and processes were project-specific predominantly monitoring the progress in project implementation; however, the road asset management system built under the NHAI-TA should allow MORTH to better monitor the roads upgraded under the project.



c. M&E Utilization

M&E findings were reported to government officials and the World Bank on a quarterly basis. Project restructurings and decision to transfer pending road works to GNHCP were taken based on the M&E findings. Because of the absence of indicators sufficiently capturing project outcomes related to technical assistance activities, M&E data could only be used to provide evidence of application of inputs and achievement of outputs related to the achievement of the second objective.

Overall, the M&E quality is rated Modest because of significant shortcomings in M&E design and implementation making it difficult to assess the achievement of project objectives and test the links in the results chain.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

At appraisal, the project was classified as Category A under Environmental Assessment (OP/BP 4.01) and triggered Natural Habitats (OP/BP 4.04), Forests (OP/BP 4.36), Physical Cultural Resources (OP/BP 4.11), Indigenous Peoples (OP/BP 4.10), and Involuntary Resettlement (OP/BP 4.12) safeguard policies.

Environmental Assessment (OP/BP 4.01): The project was classified as Category A (full assessment) because of the potential significant adverse impact on environment, such as felling of large number of roadside trees, deterioration of water resources, increased noise and air pollution during construction and operation affecting schools and health facilities, and the potential for poorly planned or managed development induced by the improved roads. An Environmental Management Framework (EMF) was prepared to guide the preparation and implementation of the over-all project. Subproject specific Environmental Impact Assessment and Environmental Management Plans (EMPs) were prepared. These documents were disclosed in the country and on the World Bank's InfoShop. The EMPs were implemented and the project was compliant with this safeguard policy. The ICR does not report any specific issue with the implementation of this safeguard policy. However, the Implementation Status and Results Reports (ISR) report that there were significant shortcomings in road and work zone safety, drainage and waterway clearance, compliance with labor regulations, and protection works at bridges, culverts, and embankments. Some of these shortcomings continued through to project closing, and the overall safeguards rating was downgraded to Moderately Unsatisfactory in the last ISR.

Natural Habitats (OP/BP 4.04): This safeguard policy was triggered to avoid adverse impacts on critical natural habitats and wildlife. This safeguard policy was to be used to screen projects to ensure that roads to be constructed under the project would not pass through ecologically sensitive areas. During the environmental screening, natural habitats and wildlife crossings were identified along or close to some



subproject areas. The ICR does not report any specific issues with the implementation of this safeguard policy.

Forests (OP/BP 4.36): While the project was not expected to have a significant impact on the health or quality of forests, and the rights and welfare of people and their economic level dependent upon the forests, some subprojects were expected to result in forest land diversion and affect protected forests along most of the roadsides. Review of the project designs resulted in avoiding these areas. The ICR does not report any specific issues with the implementation of this safeguard policy.

Physical Cultural Resources (OP/BP 4.11): Implementation of some sub-projects were expected to affect religious structures of local significance. Additionally, chance finds at works sites were considered to be likely. The ICR does not report any specific issues with the implementation of this safeguard policy. In their email dated January 18, 2023, the project team stated that some religious structures and shrines had to be relocated in consultation with the communities following necessary religious procedures. Some common property resources, such as school compound wall, community halls, and handpumps were relocated under this safeguard policy with full consultation with communities.

Indigenous Peoples (OP/BP 4.10): This safeguard policy was triggered because some subprojects were to pass through districts dominated by local tribes. Indigenous Peoples Development Plans (IPDPs) were prepared. Resettlement Action Plans (RAPs) included actions required to comply with this safeguard policy, and these actions were implemented. Excluding one grievance received, remaining 346 were resolved satisfactorily. In their email dated January 18, 2023, the project team stated that some religious structures and shrines had to be relocated in consultation with the communities following necessary religious procedures. Some common property resources, such as school compound wall, community halls, and handpumps were relocated under this safeguard policy with full consultation with communities. These activities were implemented in coordination with the Integrated Tribal Development Agency.

Involuntary Resettlement (OP/BP 4.12): This safeguard policy was triggered because land acquisition resulting in resettlement was required for road widening and construction of bypasses. Based on the Resettlement Policy Framework (RPF), subproject specific Resettlement Action Plans (RAPs) were prepared and disclosed in the country and the World Bank's InfoShop. Consultations with affected communities resulted in minimizing the resettlement impacts. Land acquisition needs were inaccurately identified for four roads in the state of Bihar because of inadequate road designs. This led to variations in the number of PAPs. Road designs were revised to avoid bypasses that required land acquisition. During project implementation, disbursement of compensation to project-affected people (PAPs) were substantially delayed in several sections but by project closing, all 11,138 PAPs were compensated for land acquisition for the subprojects completed under the project. The supervision of this safeguard policy related to the civil works transferred to and implemented under the Green National Highway Corridor Project continues under that project.

b. Fiduciary Compliance

Financial Management

The government's financial management system was used for the project. Financial management arrangements were adequately outlined in the project's financial management manual. The unaudited



interim financial reports were satisfactory to the World Bank, but they were submitted with delays. The project had been non-compliant through to project closing with the legal covenant that required an internal audit to be conducted by the borrower every six months. Audits had been carried out only once in a calendar year, and the reports were shared after substantial delays. The audit reports of independent external auditors were always submitted after the due to date of December 31. These audit reports were qualified and included observations, but the ICR does not provide information about what those observations were and how they were addressed. In their email dated January 18, 2023, the project team listed the some of the observations as non-compliance with the provisions of the EPC contract, leading to overpayment; release of withheld amount without assigning any reason; non-reconciliation of expenditure with the Pay and Accounts Office; payment without verifying supporting documents; non-adoption of uniform methodology leading to overpayment; improper calculation of price adjustment on civil works resulted in excess payment to contractors. The project also stated that clarifications were sought from the government about these issues reported in the audit reports, and if no clarification was received about an irregular payment, that amount was adjusted from the claims. There were recurring financial management staffing issues at the MORTH and the PIUs such as frequent transfers, non-availability of officials, or insufficient attention by the officials to financial management issues. For example, there were no finance and accounts staff available in Karnataka and Rajasthan. There were no known issues of corruption or misuse of funds associated with the project. The project team confirmed that all project funds were accounted for at the time of project evaluation.

Procurement

Some subprojects were ready for bidding before the start of the project because of the government’s readiness criteria, and the procurement of contracts for those works was completed on time. Those subprojects were completed before project closing. Procurement of all 15 civil works contracts was completed without delay. The project used e-procurement for the procurement of all project-financed works, goods, and consultancy services; a first in India. The procurement was compliant with the requirements of the World Bank’s procurement guidelines.

c. Unintended impacts (Positive or Negative)

None.

d. Other

None.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Satisfactory	



Bank Performance	Moderately Satisfactory	Moderately Satisfactory
Quality of M&E	Modest	Modest
Quality of ICR	---	Modest

12. Lessons

This review has drawn three lessons based on the information in the ICR.

Engineering, procurement, and construction (EPC) contracts can decrease construction time and project cost compared to traditional item rate contracts if managed effectively. The project introduced EPC contracts as an alternative to traditional item rate contracts that generally result in construction time and cost overruns. By shifting the design and construction controls and risks to the contractors, the EPC contracts can reduce such overruns. However, the success of this kind of contract type depends on its effective management. This includes ensuring that contractors have adequate cash flows based on realistically planned milestone payment conditions to allow regular payment for completed works and that approvals are processed in a timely manner such as changes in scope or extension of time. Otherwise, as experienced in this project, contractors’ solvency can hamper project implementation and result in incompleteness of works before project closing. These were some of the reasons why the average cost per kilometer of road under the EPC contracts, i.e., US\$0.57 million, was similar to the average cost under the traditional item rate contracts with one important difference that the former included a five-year performance-based maintenance phase after project completion.

A weak theory of change can prevent a proper assessment of the achievement of project objectives. The project was to finance technical assistance activities to enhance the institutional capacity of MORTH to better operate roads under its purview—Objective 2. However, the outcomes expected from these technical assistance activities were not sufficiently identified. The causal pathways from project inputs and outputs to expected outcomes and the achievement of project objectives were broadly valid but not direct. It was not clear how the enhancement in the institutional capacity of MORTH would lead to better management of the highway network under its purview. Furthermore, the results framework did not include any indicator to capture the achievement of this objective, to enhance MORTH’s institutional capacity to better manage the roads under its purview. There is no evidence of MORTH operating these roads better compared to the situation before project start. These shortcomings resulted in a Modest rating for the efficacy of the project in achieving this objective.

Project implementation units operating under state agencies can facilitate a smoother project implementation because of their close relationship with the local authorities. The implementation of road projects might be delayed because of issues related to utility and forest approvals and land acquisition. In India, such matters fall under the jurisdiction of the local authorities. PIUs operating under state agencies can address such delays faster because of their close relations with the local authorities. However, this set-up limits the federal entity’s, i.e., MORTH, control over the pace of the project implementation. The ICR states that “a hybrid approach, where



MORTH employs the PIU but also pays an appropriate agency fee to a state that is linked to their services, could be considered” (ICR, p.24).

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR provides a comprehensive overview of the project. It is candid and concise. The report’s narrative is partly evaluative and partly descriptive. There is a logical linking and integration of various parts of the report making it mostly internally consistent. The interrogation of evidence is sufficient linking the evidence to findings about the project’s impact on enhancing road interconnectivity. But the ICR’s assessment of the achievement of the second objective to enhance MORTH’s institutional capacity relies on the achievement of the outputs of technical assistance activities. It is mostly because the outcomes that would lead to the achievement of this objective were not adequately identified at appraisal, and the indicators in the results framework were insufficient to capture the achievement of this objective. The ICR fails to provide sufficient information about the achievement of some project outputs. For example, the ICR does not provide information about why only US\$3.2 million was used under the road safety component while the allocation for those activities was US\$55 million.

The report follows the Bank guidance but with some moderate gaps in certain sections. The ICR provides a very detailed economic analysis that forms a strong basis for the assessment of the project’s efficiency. On the other hand, the section on safeguards implementation could have benefited from a more detailed discussion in accordance with the Bank guidance given that the project’s overall safeguards rating had been Moderately Satisfactory through project implementation and lowered to Moderately Unsatisfactory in the last ISR. Therefore, the ICR’s (p.18) assessment of the overall environmental and social performance of the project as satisfactory contradicts with the ratings in the ISRs. The ICR reports that audit reports included some observations; hence, they were qualified, but the ICR does not provide information what those observations were and how they were addressed by the project implementation entities. Some statements in the report lacked sufficient explanation. For example, the ICR (p.18) states that “MORTH and the Bank team put considerable effort guiding some of the consulting firms to produce the outputs required under the Terms of Reference” but the ICR does not explain what issues these firms had in producing those outputs or how the MORTH and the project team guided them. The entries in the “Lessons and Recommendations” are based on specific experiences of the project and broadly follow the narrative in the ICR, but they are mostly in the form of findings rather than lessons or recommendations.

Overall, the quality of the ICR is rated Modest.

a. Quality of ICR Rating



Modest