SBF Project Completion Note

India: Madhya Pradesh Rural Connectivity

1. Project Information

Project ID:	P000020	Instrument ID:	L0020A
Member:	India	Region:	Southern Asia
Sector:	Transport	Sub-sector:	Roads
Instrument type:	Loan	E&S category:	B
Co-financier(s):	World Bank		
Borrower:	Ministry of Finance, India		
Guarantor:			
Implementing Agency:	Madhya Pradesh Rural Road Development Authority (MPRRDA)		
Project Team Leader(s):	Anne Ong Lopez,PTL		
Project Team Members:	Shiwen Dong,Project admin Jyosyula Siva Rama Krishna Sastry , SFD - Environment & Social Development Specialist Liu Yang , Project Counsel Rui Xiang , SFD - Financial Management Specialist Guoping Yu , SFD - Procurement Specialist		
Site Visits by AIIB:	August.2018 February.2019 March.2021 May.2022 February.2023 July.2023 December.2023		

2. Project Summary and Objectives

On 11 April 2018, the AIIB Board of Directors approved the India Madhya Pradesh Rural Connectivity Project (MPRCP), a USD140 million sovereign-backed financing (the Loan or the Project) to the Republic of India (the Borrower). The Loan Agreement and Project Agreement were signed on 24 June 2018, and declared effective on 7 July 2018. This Project was co-financed with the World Bank (WB).

The Project objective was to improve durability and enhance climate resilience of gravel-surfaced rural roads in Madhya Pradesh (MP) while building the capacity of the state to manage its rural road network and road safety. These objectives were achieved through activities grouped under four components: Component A – Road upgrading, construction and maintenance; Component B – Institutional Development; Component C – Road safety management capacity development; and Component D –

Design, implementation, and management support. The specific activities included upgrading 10,495 kilometers (km) of gravel-surfaced roads to a sealed surface standard; providing 484 km additional road linkages to villages with potential for economic growth; enhancing the rural road asset management system; developing a road accident data management system and road safety improvement program; and supporting road design, construction, implementation, and road asset management.

3. Key Dates

Approval:	April 11,2018	Signing:	June 24,2018
Effective:	July 17,2018	Restructured (if any):	March 15,2023
Orig. Closing:	March 15,2023	Rev. Closing (if any):	September 15,2023
Final Maturity Date	July 01,2048		

4. Disbursement Summary (US Dollar million)

a) Committed:	140.00	b) Cancelled (if any):	15.60
c) Disbursed:	122.89	d) Last disbursement: (amount /date)	1.39 / January 24,2024
e) Undisbursed (if any):	1.51	f) Disbursement Ratio (%)[1]:	98.79

5. Estimated and Actual Costs

Initially, capital support for the Project was a USD140 million AIIB Loan, co-financed by a USD210 million loan from WB. Both AIIB and WB financing all four components. Component costs were revised during project implementation stage to reflect the partial loan cancellation. As a result, the total Project cost was revised from US$502 million to US$462.6 million. The Project underwent changes due to a) An extension of the Loan closing date from 15 March 2023 to 15 September 2023, to enable completion of Project activities; (b) A partial cancellation of US$39 million in loan savings (US$23.4 million and US$15.6 million from the IBRD and AIIB loans, respectively) due to exchange rate fluctuations during Project implementation; and (c) Reallocation of the loan between disbursement categories. The time extension was to complete delayed Project activities which were affected by the COVID-19 pandemic. Loan savings occurred as major contracts were in Indian currency, which depreciated against the US dollar, the designated loan currency.

6. Project Implementation, including major changes to the original Objective, Project Design, and Indicators

The Project was implemented by the Madhya Pradesh Rural Road Development Authority (MPRRDA). MPRRDA was created for the specific purpose of implementing the national connectivity program,

[1] Disbursement Ratio is defined as the volume (i.e. the dollar amount) of total disbursed amount as a percentage of the net committed volume, i.e., f = c / (a – b)

"Pradhan Mantri Gram Sadak Yojana" (PMGSY). The primary objective of the PMGSY was to provide connectivity by way of an all-weather road with necessary culverts and cross-drainage structures operable throughout the year. MPRRDA used its existing institutional structure to the extent possible to implement the Project through support from other Government of Madhya Pradesh (GoMP) departments, including transport, police, revenue, forest, district collectors, and local offices.

The Project objectives, as stated in the Loan Agreement, were to improve durability and enhance resilience to climate changes of the gravel-surfaced rural roads in Madhya Pradesh while building the capacity of the state to manage its rural road network and road safety. Four outcome indicators were used to measure the achievement of the objectives: (i) Annual maintenance cost per km; (ii) Roughness index; (iii) Rural Road asset management system developed and in use; and (iv) Share of the state highway network covered under the Road Accident Data Management System (RADMS). The objectives and outcome indicators were not revised during project implementation. At the end of the project, all three project objectives were achieved. All outcome indicator targets were achieved or exceeded.

The Project design remained relevant during implementation and did not require modification. Despite the prolonged negative impacts of the COVID-19 pandemic, the Project needed a closing date extension of only six months. At closing, 98.79 percent of the Loan was utilized, and the savings due to currency depreciation were canceled.

Components	Physical Progress*	Environmental & Social Compliance	Procurement
Component A: Component A.1: Road Upgrading, Construction and Maintenance	The roads under this component were selected based on specific criteria: First, only gravel roads constructed under the MP-level Chief Minister Gram Sadak Yojana (CMGSY) program were considered. Second, roads connecting villages following a certain population threshold (150-499 for normal area and 100-249 in tribal area) were upgraded in a phased manner, i.e., according to descending order based on population. The selected roads were vulnerable to severe weather conditions and	Respirable Dust Monitoring: Assessment done on 100 roads. After BT, the dust concentration for the selected roads is below 100 µg/m3 for PM10 which is the limit prescribed by Central Pollution Control Board (CPCB, India). Enhancements: Through consultation and involvement with the local communities during the execution of works, several small and local mitigation and environmental enhancement works have been implemented. They include (i) provision of	Procurement was handled smoothly by MPRDDA. Civil works, which constituted the biggest share of the Project, were implemented through 821 packages for Component A and were completed with only a six-month extension of the Loan closing date, despite the impact of the COVID-19 pandemic. This outstanding performance can be partly attributed to a mature construction

	were unable to ensure all-year connectivity between villages. Site-specific climate resilience measures identified and implemented include: (i) raised embankments and their protection in flood-prone areas; (ii) improvement or provision of new water crossings; and (iii) water drainage inside habitations. The Project adopted the asphalt binder VG-30 standard to withstand extreme ambient temperatures up to 48 degrees Celsius, which is above the maximum temperature projected in the state for 2030. Beyond supporting rural connectivity, the Project added safety features such as road markings and traffic calming measures through the integration of Intelligent Transport Systems (ITS). Other enhancements included hygiene improvement around hand pumps, protection works along water bodies and additional 158.06 km of last mile connections from the main roads to socio-economic facilities such as schools, hospitals, and cremation areas.	ramps/ extended approaches to utility centers; (ii) improvement of cattle troughs, wells, hand pumps, and other water sources; and (iii) safety provisions within settlements and near sensitive receptors, amongst other provisions. Waste plastic technology: The project upgraded 10,979 km to BT sealed standard, of which 2,398 km were constructed using a new technology involving plastic waste. The new technology enabled the reduction of plastic in the environment, while providing a lifespan of at least two times more than BT sealed roads. Women's Self-Help Group (SHG) in off-carriageway maintenance: The Project trained and contracted ten women's SHGs in Anuppur, Dahr, Dindori and Mandla tribal districts, comprising 106 women, to undertake off-carriageway maintenance works. Beneficiaries of the	industry developed through implementation of the PMGSY program. Across all components, over 1,600 procurement packages were successfully implemented by the MPRRDA. The two procurement challenges encountered were: (i) change in goods and services tax, which led to the retendering of 285 packages for road works; and (ii) low responsiveness to the RRAMS consultancy packages, and the subsequent failure to mobilize consultants for the assignment. These issues have been resolved by MPRDDA during Project implementation.

	To keep acceptable levels of service, a five-year post-construction maintenance period was embedded into the works contracts. While the gravel roads would initially require frequent maintenance interventions including possible re-graveling after heavy rains, only routine maintenance activities (mainly cleaning works) were being applied on the same roads two years after upgradation to bituminous treatment (BT) standard. Considering the three-tier quality control mechanism which was used to achieve 97.94 percent satisfactory quality road works during construction, maintenance cost is expected to be minimal for at least five years.	program have highlighted its positive impacts, including financial inclusion, enhanced self-employment, and a sense of empowerment and ownership for the built road assets. At appraisal, the lack of all-weather roads in rural MP acted as a barrier to regular school attendance for girls, as they were unable to use bicycles provided under the "Free Bicycle Yojana" scheme due to the low quality of roads. At the end of the Project, the area recorded a modal shift of 84.02 percent from walking to cycling. This resulted in an increase in the school enrollment for girls. As indicated by the findings of the impact assessment, 96.7 percent of the respondents confirm this positive change.	
Component A.2: Provision of Alternate Connectivity	The roads under this component were selected based on economic activity, traffic on the existing links, and the population of the villages. Roads carrying more traffic and about 10 km in length, which provide access to 3 or	As above	As above

	more villages and benefit at least 5,000 population, were considered. 484 km of alternative roads were constructed. Some of the originally planned road sections were covered under other national programs.		
Component B. Institutional Development B1: Rural Roads Asset Management System (RRAMS)	At appraisal, MPRRDA did not have a proper roads inventory and lacked a scientific approach to investment prioritization. Through the Project, enhancing MPRRDA's capacity was given particular attention making MP the first state in the country to develop and roll out a RRAMS. At Project closure, the state had prepared and adopted a post-five, ten- and fifteen-years' maintenance policy, the only rural road agency in the country doing that systematic approach to maintenance management. The RRAMS is currently used for effective performance management of the entire rural road network in MP, well beyond the rural road network under the Project. The system is also being used by	Project investments in institutional capacity strengthening have simplified internal processes, enabled real-time monitoring, and the production of reliable multi-year maintenance budget plans. The RRAMS, GeoReach and e-Marg are being replicated in other states. Information/module on environmental aspects, including roads constructed using new technologies and alternative construction materials, proximity from environmentally protected areas like national parks and wildlife sanctuaries, avenue plantations, road furniture, etc. were incorporated in RRAMS.	As above

	MPRRDA to prepare annual investment and maintenance plans. The RRAMS includes a Rural Accessibility Index (RAI), a very important and global development indicator used in the transport sector to monitor progress of the rural connectivity agenda in MP. For sustainability purposes, MPRRDA has trained staff to collect the necessary data but also to maintain the system. The RRAMS complements other e-governance systems completed with project support, including: (i) e-Marg, for online maintenance management, that has subsequently been rolled out countrywide to support multi-year maintenance using a performance-based approach; and (ii) GeoReach, which was initially developed for online monitoring, and has since been integrated with the Public Financial Management System (PFMS) to facilitate the payment of contractors' invoices and capture real time images of physical progress. The positive impact of using e-governance systems		

	such as e-Marg and GeoReach have been felt beyond MP and have been recognized through awards at the national and state levels.		
Component B2: Strengthening Design, Research and Quality Assurance Capacity	The design and research capacity of MPRRDA was strengthened along with the capacity of the existing training academy i.e. Madhya Pradesh Rural Road Academy through the following: - Strengthened the design capacity, additional road and bridge design software systems were procured and staff were trained to utilize these during the detailed project reports preparation and scrutiny which are now under use. - MPRRA training academy enhanced its scope and coverage to include various training programs including on Road Safety Audit, Pavement Design, Construction, Evaluation & New Technologies for Rural Roads, Conceptual Training on Design of Bridge and Foundation for MPRRDA officials which are now being delivered regularly. A Memorandum of Understanding was signed with the Central Road Research Institute	MPRRDA benefited from: (a) strengthening of the rural roads academy (center of excellence for training rural roads professionals), enhancement of the design and research unit, upgrading of laboratories and development of an e-learning management system; and (b) Capacity building in the areas of engineering and quality aspects of rural roads, road safety audit, pavement and bridge design, WB procurement policies, contract management, environmental and social safeguards, alternative design and construction technologies, and design software (e.g., MIDAS, ORD Bentley, and HDM-4).	As above

	(CRRI) to deliver trainings in Road Safety Audit, pavement design and bridge design. MPRRDA is also exploring opportunities for partnerships with other technical institutions as well to deliver trainings in those areas not already covered. - Further, for sustainable and modern skill enhancement, an online learning management system was developed and adopted for delivering mandatory training courses for staff of MPRRDA and has been hosted on the state server with 15 modules in different themes and 320 staff were trained and are using this system now. - Field laboratories of MPRRDA at the district and block levels have been strengthened with modern Information Technology (hardware and software) and testing equipments to enhance quality control mechanism.		
Component C. Road Safety Management Capacity Development C1: Development of Road Accident Database Management System	The Integrated Road Accident Database (iRAD), which was developed at the national level under Ministry of Road Transport and Highways (MoRTH), was	Consultations with relevant stakeholder agencies have been done to identify the additional roll-out requirements for the	As above

(RADMS)	customized to MP to effectively manage road safety through timely reporting of road accidents. Key stakeholders, including the Police, health and transport departments, were given access to the iRAD system to populate and analyze road accident data. This enabled joint responsiveness where appropriate and informed the formulation of future policies and strategies. At Project closing, the entire MP road network (including state highways, major and ordinary district roads, and village roads) was covered by iRAD, with the Police Department taking an active role in collecting and entering road accident data in iRAD. The MoRTH will develop a Citizen Mobile App for citizens to report road accidents. The Gram Panchayats (Village Councils) have been made aware of reporting road accidents during the road safety awareness campaigns.	community mobile application.	
Component C2: Pilot Comprehensive Road Safety Program (PCRSP) C2.1: Road Safety Engineering (Technical Assistance, Road Safety	A comprehensive safe system approach to road safety management was piloted for the first time in India, in Indore, Dhar and Datia districts of MP,	The content and final scope of the pilot program were informed by stakeholder consultations including	As above

Engineering Interventions) C2.2: Enforcement (Technical Assistance, Equipment for Road safety Engineering) C2.3: Post-Crash Emergency Management (Technical Assistance, Equipment and Trauma Care Facilities) C2.4: Road Safety Education and Awareness	focusing on Education, Engineering, Enforcement and Emergency management (4E). The program included innovative safety interventions such as the use of roller crash barriers, solar powered speed display boards, speed-limit markings on road pavement, use of ITS measures on pilot corridors to enforce speed, and helmet-usage. The program was a success and received certificates of appreciation from the concerned municipalities. The main achievements include: - Education. Road safety awareness was led by campaign agents selected from NGOs and community-based organizations which created road safety working groups involving 1728 community road safety volunteers. In total nearly 100 of these groups comprising 600 members across MP were used to conduct campaigns at schools and panchayat institutions, puppet shows and displays of banners and posters. - Engineering. Civil works were implemented in 11 packages comprising	road user surveys and focus group discussions that included drivers, pedestrians, students, teachers, Non-Governmental Organizations (NGOs), rural women groups, engineering professionals and police officers. The PCRSP required a high level of coordination between many stakeholders, including the district municipalities, PWD, Police, districts health authorities, other engineering department and community stakeholders.	

	rectification of 16 blackspots, construction of a safety corridor demonstration project (20 km), construction of urban street model in each of three pilot district and training of engineers on road safety audits. - Enforcement. Trainings to 25 master trainers and 150 enforcement personnel were delivered to strengthen enforcement capacity of the pilot districts. In addition, the Project has procured road safety equipment for the Police department, including wheel lock, reflective jackets, laser speed guns, breath analyzers and digital cameras. - Emergency management. The program financed five advanced emergency wings in community and primary health centers in each of the three targeted districts. It also financed the procurement of health equipment to upgrade district hospitals to trauma care center level, strengthening of emergency units and stabilization centers, and certification/ accreditation trainings delivered for capacity		

	enhancement of doctors, nurses and other staff.		
Component D. Design, Implementation and Project Management Support	The Project implemented robust implementation arrangements by inclusion of a Project Management Consultant (PMC) at the project implementation unit (PIU) level and a Project Implementation and Supervision Consultant (PIC) at the field levels. Along with MPRRDA, PMC and PIC were put in place from the preparation phase to ensure timely and quality delivery. The use of e-governance tools (e-Marg and GeoReach) added value in eliminating cumbersome processes and paperwork while facilitating record keeping especially during the challenging times of the COVID-19 pandemic as payments processing and project monitoring were unaffected. As a project management tool, e-Marg was used as a monitoring and payment gateway for the roads under different stages of maintenance. GEOREACH (geomatics-based rural roads enterprise application for connection	PMC supported MPRRDA through the following: (a) implementation of the Jahan Pade Qadam Saavdhani Har Dum, an awareness program on Road Safety and COVID 19 – Health and Safety Measures for enhancing Self Protective Behavior for the staff and workers engaged in rural road construction sites; (b) Communications around behavioral changes towards - better road maintenance, improved road safety, reduced road damages, avoided road congestions; (c) Awareness raising to laborers and the communities on HIV/AIDS; (d) sensitization of contractors on sensitized on gender issues; and (e) Training on E&S management to Assistant Managers/Designated Safeguard officers, consultants working on Alternate Connectivity roads and field coaching to safeguards officers.	As above

	habitations) was also used as an online monitoring system adopted by MPRRDA for monitoring the physical and financial progress of the project.		

Financial Management:

The Project's financial management was satisfactory throughout implementation, with timely submission of withdrawal applications, financial reports, and audit reports. The audit reports were deemed to be acceptable by the Bank as the financial information presented was complete and accurate. The implementing agency maintained adequate financial records and submitted the required reports promptly. All expenditures including the retroactive financing incurred for the Project are eligible for financing under the relevant Loan Agreement and in accordance with the procurement policy and procedures and these were exclusively financed through Project Funds. GeoReach was developed and integrated with the Public Financial Management System (PFMS) to facilitate payments, contract monitoring, physical and financial progress monitoring, and prompt disbursement. The Project's financial management performance was satisfactory due to streamlined implementation arrangements, government systems, experienced accounting staff, and effective oversight by MPRRDA staff. The Project maintained a positive disbursement profile, with 98.79 percent of the Loan disbursed at the end of the Project.

7. Implementation of Environmental and Social Policy and project specific E&S instruments, including the project level Grievance Redress Mechanism (GRM)

AIIB adopted the WB's Environmental and Social Safeguard Policies since (i) they are consistent with the Bank's Articles of Agreement and materially consistent with the provisions of the Bank's Environmental and Social Policy and relevant Environmental and Social Standards; and (ii) the monitoring procedures that the WB has in place to ascertain compliance with its Safeguard Policies are appropriate for the Project. Under the WB's Safeguard Policies, the Project was assigned Category B. Three of the WB's Safeguard Policies were applied to the Project: OP 4.01 Environmental Assessment; OP/BP 4.11 on Physical Cultural Resources; and OP 4.10 Indigenous Peoples.

There was no involuntary resettlement and where land acquisition was required, it was to be done through voluntary donations by the beneficiaries. An environmental management framework was prepared and disclosed at appraisal. Environmental and social safeguards staff were part of the PIU and the PMC. Safeguard aspects were reflected in the standard bidding documents, and environmental and social, as well as health and safety (ESHS) management strategies and implementation plans were included in the signed contracts. The safeguard requirements specified in the environmental and social management plans (ESMPs) were adhered to during implementation and no major issues were observed.

The PIU prepared and disclosed a Social Management Framework (SMF) and a Vulnerability Framework

(VF) to address key social issues related to the lack of participation in the planning and implementation of rural roads, ensure mitigation of adverse impacts on assets, and address land donation when land was required, and to maximize benefits for the population, particularly marginalized sections including tribals. Community inputs were captured during design stage of the project through several consultations including transact walks with villagers on the existing gravel roads. Community consent was achieved readily as the communities were keenly looking forward to enhancement of the roads, connect the roads to key facilities such as schools, other government buildings. Suggestions and inputs were captured in the form of minutes which were included in Detailed Project Reports (DPRs). Provisions and processes outlined in these documents were mainstreamed in the overall project planning and implementation cycle through the DPRs and subsequently through the PMC and the PIC consultants.

To improve citizen engagement and maximize beneficiary satisfaction, radio programs were broadcasted on the national radio during the COVID-19 pandemic to cover essential topics, including rural road safety, transportation of laborers, and sanitation of tools. The Project received and redressed all 318 grievances at the first two levels, village level and PIU level of the five-tier GRM system, thanks to the social acceptance received as a result of smooth flow of information facilitated by the 3,978 Marg Mitras (road volunteers) nominated by the villagers to act as intermediaries between the PIU and the local communities. Such engagements helped to reduce situations leading to grievances and redressal of grievances at first two levels. Second tier GRMs at PIU level included the concerned engineering staff of the Department, who could mobilize the required departmental support to resolve grievances without further escalations to next levels.

8. Results Achieved (Against the original indicators and/or revised indicators. RMF table will be exported on the last page of this PCN.)

Overall, the Project met or exceeded nearly all its Project objectives and intermediate indicators. Please see results monitoring framework for more information.

Remarks:

9. Investment Sustainability (operational, financial/commercial, institutional)

To ensure the sustainability of the project roads, the state prepared and adopted a post-five, ten- and fifteen-years' maintenance policy, the only rural road agency in the country focusing on a systematic approach to maintenance management. The RRAMS supported by the Project is also currently used for effective performance management of the entire rural road network in MP, well beyond the rural road network under the Project. The system is also being used by MPRRDA to prepare annual investment and maintenance plans.

The economic analysis carried out at appraisal was replicated at completion using the same methodology over a 20-year period. The table below provides a comparison of the economic internal rate of return (EIRR) and the net present value (ENPV) of the project at appraisal and at completion.

Details	Year	Total Road length (Km)	EIRR (percent)	ENPV discounted at 6 percent (INR Million)
Processing stage	2016	10,510	25.5	50,684
Completion stage	2023	10,979	19.4	33,424

The EIRR at completion was negatively affected by lower observed traffic than anticipated (as traffic had not fully recovered from the impact of the COVID-19 pandemic) outweighing the impact of reduced dollar costs at completion. However, the end of project EIRR of 19.4 percent is considered good for rural roads.

The Project carried out an assessment of the gains recorded in the project area (in agriculture expansion, increase in income and job creation, access to socio-economic facilities, and poverty reduction) through a desk review, in-depth interviews and focus group discussions in ten divisions in the state, 20 districts (two from each division), and 100 villages (five villages per district) where a total of 800 households were interviewed. The key findings are summarized below. Apart from savings in travel time, the achievements in other parameters also reflect the impact of other programs in the project area and are partly attributable to the operation.

Impact assessment key findings

(Note: Figures on the second row for each parameter represent the corresponding percentage of respondents.)

Parameter	Before the project	After the project
Travel time taken to visit agricultural market (in minutes) (Mandi)	90-120	30-60
	53.8 percent	57.1 percent
Travel time taken to visit an urban center (in minutes)	60-90	30-60
	47.3 percent	94.6 percent
Use of fertilizers and improved seeds (Yes/No)	Yes/No	Yes/No
	21.2-78.8 percent	97.8-2.2 percent
Prices of land around the villages (in Rupees lakh)	1-4	8-12
	88.1 percent	58.6 percent
Off-farm employment opportunities (in days/year)	100-200	200-300

	62.4 percent	61.4 percent

10. Compliance and Alignment with AIIB's Policies and Strategic Priorities

The Project was aligned with AIIB's priorities of enhancing economic growth and sustainability through infrastructure investment.

11. Any outstanding issues not yet resolved, if applicable

n/a

12. Lessons learned that can be considered for future investments

Lesson Tag	Lesson Description
Technical	(a) Good quality at entry. The team built on previous rural connectivity programs (PMGSY and CMGSY) to implement an appropriate project design. This was supported during implementation through knowledge exchange workshops. This Project's experience confirms that good quality at entry is a pre-requisite for a successful project outcome.
Procurement	(b) Advance and parallel procurement of project activities. Borrowing experience from the implementation of the PMGSY program as mentioned in the previous paragraphs, timely procurement for most Project activities (with 30 percent of works contracts awarded prior negotiation) was an important contributor to effective and timely project implementation. Project teams should ensure that a procurement plan is ready before implementation starts and some of the contracts are awarded prior to negotiations.
Project Management	(c) Appropriate implementation arrangements. A team comprising representatives of MPRRDA, PMC and PIC commensurate with the project size and geographical coverage was put in place from the preparation phase to ensure timely and quality delivery. The use of e-governance tools (e-Marg and GeoReach) added value in eliminating cumbersome processes and paperwork while facilitating record keeping especially during the challenging times of the COVID-19 pandemic as

	payments processing and project monitoring were unaffected. MPRRDA put in place a robust and effective quality and performance monitoring system, adapted from the state quality monitoring system used successfully in PMGSY. The monitoring system included (i) quality control of works through the independent construction supervision consultant; (ii) PIUs assisted by the standard quality control consultants directly responsible for quality control of the works, materials and workmanship and random tests of the quality of works by MPRRDA; and (iii) independent state quality monitors undertook quality monitoring and submit their reports, including overall compliance with contract conditions, physical and financial progress, and feedback from consultations with local communities on the quality of the work and any modification required in the engineering design, to MPRRDA.
Institutional	(d) Institutional coordination. The Project experienced delays in completion of the road safety activities due to lack of timely responsiveness of the key stakeholders at the project level. Where implementation requires joint efforts, teams should ensure early involvement of the relevant stakeholders and the formation of “functional” technical/steering committees led by a designated “Champion” institution.
Social	(e) Public consultations for effective mainstreaming of project objectives. Public consultations between MPRDDA and the beneficiaries led to the designing and implementation of social enhancement activities that included approach roads to schools, hospitals, and hand water pumps. Road user surveys and focus group discussions led to a well-designed PCRSP. Effective mainstreaming was further strengthened by Marg Mitras who played an important role in ensuring the transmission of key messages between the PIU and the local communities, reducing the number of grievances. Bank project teams should consider maximizing

	public consultations during project design and preparation, with due regard to the local context. Environment and social mitigation measures can also be strengthened through meaningful consultations with PAPs and avoid reputational risks as well as minimize grievances in the long run.
Technical	(f) Implementation of project-specific climate mitigation measures. The Project is a very good example of a combination of adaptation measures aiming at responding to the challenges on the ground. Various interventions to cater to both heavy rains and high temperatures impacts (use of BT, plastic waste, VG-30 asphalt binder) were carefully selected to respond to the challenges identified at appraisal. Project teams should avoid "one size fits all" solutions as site conditions matter while determining the right interventions.
Other	(g) Joint impact amongst co-financiers. To increase the impact of the operation, the co-financiers of the Project, WB and AIIB, worked closely to not only co-finance the project, but also provide coordinated inputs (technical, environmental and social, etc.) during project preparation and implementation. Strong coordination amongst co-financiers, through joint missions and site visits for example, is important to ensure smooth and timely implementation across the project cycle.

13. Borrower's Feedback

The Borrower's feedback is reflected in Annex 1 based on the feedback received from the MPRRDA.

14. Achievement of Project Results

The Project objectives were three-fold: (i) improve durability and enhance resilience to climate changes of the gravel-surfaced rural roads in Madhya Pradesh while building the capacity of the state to manage its (ii) rural road network and (iii) road safety.

In terms of the objective to improve durability and enhance resilience to climate changes of gravel-surfaced roads, the outcome indicator target related to International Roughness Index (IRI) was exceeded. The average IRI at the end of the Project was 3.22, based on measurements taken on 450 roads that represented about 10 percent of the total length. The baseline for the annual maintenance cost per km (also an outcome indicator target) was revised to Rs. 346,000/km (US$4,696.62) using the

exchange rate of 1US$= Rs 73.67. At the end of the Project, the unit maintenance was Rs.239,000 (US$3,244.19), realizing savings of 30.9 percent against the estimated target of 25 percent.

In terms of the objective to enhance MPRRDA capacity to manage its rural road network, the outcome indicator related to having a prioritized maintenance network and investment plan approved by competent authorities was achieved. By project closing, the system was developed and is currently in use (compared to the baseline of no proper roads inventory and lack of a scientific approach to investment prioritization). Approved multiyear maintenance plans for the Agency are also in place.

In terms of the objective to improve MPRRDA capacity to manage road safety, the outcome indicator related to the 100 percent share of the state highway network covered under RADMS was exceeded. In fact, RADMS was extended beyond the state highway to the entire road network of MP.

Annex: Client Feedback on the Project

Annex 1. Feedback on AIIB Support for Madhya Pradesh Rural Connectivity

1. Are the services and support provided by the AIIB Project Team professional, sufficient and in time, during project preparation and project implementation?

During the project preparation, the Project Team Leader provided continuous input on technical aspects, planning and the Social Development Specialist provided continuous input on safeguard provisions at the Detailed Project Report (DPR) stage. During implementation, the Project Team Leader provided support and input during the mission visits and in between missions as well.

2. Is it convenient to access the AIIB Project Team's services and support?Yes, the AIIB Project Team was always available and supportive, enabling a smooth implementation of MPRCP.

3. Does the AIIB Project Team demonstrate flexibility and efficiency during project preparation and project implementation?

Yes, the AIIB Project Team provided flexibility & efficiency. During C-2 implementation site visits, the Project Team Leader provided insightful, suggestion for appropriate monitoring of the component. The Project Team Leader was very prompt on providing guideline and follow-up with DEA for project extension.

4. Does the AIIB Project Team demonstrate flexibility and efficiency during project preparation and project implementation?

The value additions of AIIB's financing in the project include:

- Development of Rural Road Asset Management System;
- Institutional Strengthening; and
- Community Participatory Road Safety Program.

5. Will you consider working with the AIIB again in infrastructure development? Please provide a few specific reasons.

Yes, MPRRDA is considering collaborating with the AIIB again in infrastructure development projects because the AIIB's team is very supportive, flexible, and accessible.

6. Do you have any suggestion to the Project Team and/or the AIIB?

No response provided.

7. Other comments (such as comments on the reporting requirements, approval of project changes, etc.)

No response provided.

ASIAN INFRASTRUCTURE INVESTMENT BANK

Project Completion Note

Prepared on 08/02/24

Project Objective Indicators	Indicator level	Unit of Measure	Cumulative Target Values																	Frequency	Responsibility	Comments
			Baseline		2018		2019		2020		2021		2022		2023		End Target					
			Year	Value	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Year	Target	Actual			
Annual maintenance cost per km	Project	USD	2018	1000	1000		0		0		750		750		750			750	3244.19	Annual	MPRRDA and Supervision Consultants	Though not reflected in the project restructuring, the baseline was later revised to be US$ 4, 696.62. At the end of the project, the unit maintenance cost stood at US$ 3,244.19 achieving 30.9% of savings against 25% initially planned.
Roughness index (m/Km)	Project	Meter	2018	7	7			3.2-3.7	3.5	2.67-3.78	3.5	2.67-3.78	3.5	2.67-3.78	3.5	2.67-3.78		3.5	3.22	Annual	MPRRDA	Target achieved. Roughness surveys conducted on 450 roads give a average IRI of 3.22.
Rural road asset management system developed and in use	Project	N/A	2018	No fully GIS based network inventory data, no scientifically based maintenance prioritization	No fully GIS based network inventory data, no scientifically based maintenance prioritization									RRAMS Developed. Further 1-year warranty period is in progress. 5000 km RAMS data collected and uplo	Prioritized maintenance network investment plan – approved by competent authorities			Prioritized maintenance network investment plan – approved by competent authorities	RRAMS developed. Approved maintenance plans in place.	Annual	MPRRDA	Target achieved. Approved maintenance plans for the road network under the responsibilities of the state are in place, beyond the initially envisaged rural roads network.

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Project Completion Note

Prepared on 08/02/24

Share of the state highway network (about 11, 000 km SH and 20,000 km MDR) covered under RAD	Project	Percentage	2018	0	0				10	N/A	50	N/A	80	N/A	100	N/A		100	100	Annual	Home Department, MPRDA	Target exceeded. In addition to the targeted state highway network, coverage was extended to the entire MP road network.

Project Intermediate Indicators	Indicator level	Unit of Measure	Cumulative Target Values																	Frequency	Responsibility	Comments
			Baseline		2018		2019		2020		2021		2022		2023		End Target					
			Year	Value	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Year	Target	Actual			
Roads constructed - rural	Project	km	2018	0	0		2000		3500		4150		750		110			10510	10979	Quarterly	MPRRDA	The project exceeded the total number of kilometers to be constructed. Equally important road sections that could fit within the budget were considered for improvement to enhance the project objectives.

Roads upgraded to bituminous surface	Project	km	2018			4888	2000	2239	3500	921	4000	350	500	1821		10445		10000	10495	Quarterly	MPRRDA	
New road construction (multiple connectivity)	Project	km	2018			691					150	170	250	255	110			510	484	Quarterly	MPRRDA	
Length of roads on which alternative surfacing technology piloted	Project	km	2018					785	500	1108	1000	1889	600	2065				2100	2398	Annual	MPRRDA and supervision consultants	
Rural population connected by all-weather paved roads	Project	Number	2018	35,000,000	35,000,000		150,000	682,000	600,000	370,000	600,000	1,347,033	150,000	724,740				36,500,000	38570552	Annual	MPRRDA	
Percentage of high school girls shifting from walking to biking to schools	Project	Percentage	2018	10	10									83				80	84.02	Annual	Consulting firms and MPRRDA	
Dust concentration in the ambient air along the Project roads	Project	Microgram /m3	2018	0	0			Baseline survey completed	0	PM10 measurement on bituminous road has been done. The end target to be fixed.	0	Maximum value was achieved in Neemuch 91.98, and Minimum was Khandwa 49.92, mean value of PM10=66.77	0		0			0	40.98	Once after each of the sample roads are completed	MPRRDA through a firm	Baseline assessment done on 100 roads: Maximum value achieved being 91.98, and Minimum was 49.92. The endline results are 76.61 and 40.98.
Number of Women's Self-Help Groups (SHGs) engaged in post construction maintenance contracts	Project	Number	2018	0	0				2	A tri-partite agreement is signed between PIU, SRLM (State Rural Livelihood	5	5	5	5	5	7		5	10	Quarterly	MPRRDA	

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										Mission), and SHG.											
Number of women participating in road maintenance within SHG	Project	Number	2018	0	0				20	N/A	50	N/A	50	54	50	74		50	106	Annual	MPRRDA	
Rural roads asset management system developed	Project	N/A	2018	No comprehensive network based asset management system	No comprehensive network based asset management system		Procurement of system definer (SD) consultant for RRAMS advanced	Consultant for the gap analysis of RAMS is on board.	(i) SD consultant in place and defining the RRAMS system requirements; (ii) Procurement of System Pr		(i) RRAMS developed and data for 10,000 km of rural roads entered and RRAMS tested; (ii) Procurement	Consultant for gap analysis hired but could not be mobilized due to the challenges of Covid-19. TOR		RAMS developed and data for 5000 km of rural roads entered and RAMS tested	GIS based network data and information collected for about 116,000 km rural roads	RAMS developed and data for 5000 km of rural roads entered and RAMS tested.		Comprehensive network based asset management system developed	Yes	Annual	MPRRDA	Target achieved. Rural Road Asset Management is developed and in use to produce multi-year maintenance plans for the state road network.
Design and research unit established in MPRRDA	Project	N/A	2018	No design and research unit in MPRRDA	No design and research unit in MPRRDA				Organizational structure, staffing plan and functional manual prepared	RCTRC (MPRRA) and design cell have been established in Walmi, Bhopal.	Design unit set up and becomes operational	List of activities for further strengthening of the design & research cell to be prepared		Ongoing process for software procurement, laboratory equipments, and e-LMS.				Yes	Yes	Annual	MPRRDA	Target achieved. A design and research unit was established with MPRRDA and is functional. An e-learning management system was developed and designed software packages to support their operations were successfully procured.

Number of Gram Panchayats reporting on road traffic crashes	Project	Number	2018	0	0						100	N/A	400	N/A		N/A		500	500	Annual	Home Department, Traffic Police Directorate	Target achieved. The development of the IRAD was successfully completed. Traffic crashes reporting through the Gram Panchayats is being done as envisaged.
Number of crash locations/blackspots/junctions/ pedestrian facilities improved	Project	Number	2018	0	0						25		25	In the Pilot Phase total 3 districts have been taken Indore, Dhar and Datia.				50	16	Annual	MPRRDA, Traffic Police	Target moderately achieved. The remaining blackspots were improved through state financing.
Number of MPRRDA's staff trained	Project	Number	2018	0	0		110	50	125	107	40	232	15	262	10			300	1225	Annual	MPRRDA	
Training on WB procurement policies, contract management and quality assurance	Project	Number	2018	0	0		50	30	25	30	25	60		110				100	100	Annual	MPRRDA	
Staff trained on environmental and social safeguards	Project	Number	2018	0	0		50	10	50	50		165						100	200	Annual	MPRRDA	
Staff in the new design unit trained on alternative design and construction technologies	Project	Number	2018	0	0		10	27	15	10				37 Staff trained in Hyderabad and more will be trained.		37 Staff trained in Hyderabad and more		25	37	Annual	MPRRDA	

																will be trained.						
Staff trained on design software	Project	Number	2018	0	0				25									25	25	Annual	MPRRDA	
Citizen satisfaction index	Project	Number	2018	0	0		1.5				3.5	2.33			3.5	3.69-3.87		3.5	3.64	At mid-term and end of Project	MPRRDA through a consultant	Target achieved. This was based on sample of 100 roads covering 39 districts: Baseline Satisfaction index was 2.33, Mid Term Satisfaction index is 3.2 and End-line Survey index is 3.64.
Females satisfaction index	Project	Number	2018	1.5	1.5											3.69		3.5	3.69	At mid-term and end of Project	MPRRDA through a consultant	
Males satisfaction index	Project	Number	2018	1.5	1.5											3.87		3.5	3.85	At mid-term and end of Project	MPRRDA through a consultant	