

Project Administration Manual

Project Number: 42513-014
Loan Number: LXXXX
October 2017

India: Karnataka State Highways
Improvement III Project

ABBREVIATIONS

ADB	–	Asian Development Bank
ASI	–	Archeological Survey of India
CAAA	–	controller of aid accounts and audit
CAG	–	Comptroller and Auditor General
CRN	–	core road network
DMF	–	design and monitoring framework
DPR	–	detailed project report
EMOP	–	environmental monitoring plan
EMP	–	environmental management plan
EMPIU	–	Environmental Management Plan Implementation Unit
GOK	–	Government of Karnataka
GRM	–	grievance redress mechanism
ICB	–	international competitive bidding
IEC	–	independent engineering consultant
IEE	–	initial environmental examination
IPP	–	indigenous peoples plan
km	–	kilometer
KPWD	–	Karnataka Public Works, Ports, and Inland Water Transport Department
KSHIP	–	Karnataka State Highways Improvement Project
PIU	–	Project Implementing Unit of Karnataka State Highways Improvement Project
MDR	–	major district road
NCB	–	national competitive bidding
NGO	–	nongovernment organization
PAM	–	project administration manual
PIU	–	project implementation unit
PPP	–	public–private partnership
PPTA	–	project preparatory technical assistance
QCBS	–	quality- and cost-based selection
RP	–	resettlement plan
RRP	–	report and recommendation of the President to the Board
Rs	–	Indian rupees
SDRC	–	social development and resettlement cell
SH	–	state highway
SOE	–	statement of expenditure
SPS	–	Safeguard Policy Statement
TOR	–	terms of reference

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ABBREVIATIONS

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Project Administration Manual Purpose and Process

The project administration manual (PAM) describes the essential administrative and management requirements to implement the project on time, within budget, and in accordance with the policies and procedures of the government and Asian Development Bank (ADB). The PAM includes references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The State of Karnataka, acting through its Karnataka Public Works, Ports, and Inland Water Transport Department (hereinafter referred to as KPWD) is wholly responsible for the implementation of ADB-financed projects, as agreed jointly between the borrower and ADB, and in accordance with the policies and procedures of the government and ADB. ADB staff is responsible for supporting implementation, including compliance by the KPWD and the Project Implementation Unit of Karnataka State Highways Improvement Project (PIU) of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

At loan negotiations, the borrower and ADB have agreed to the PAM and ensured consistency with the loan agreement. Such agreement is reflected in the minutes of the loan negotiations. In the event of any discrepancy or contradiction between the PAM and the loan agreement, the provisions of the loan agreement shall prevail.

After ADB Board approval of the project's report and recommendation of the President (RRP), changes in implementation arrangements are subject to agreement and approval pursuant to relevant government and ADB administrative procedures (including the Project Administration Instructions) and upon such approval, they will be subsequently incorporated in the PAM.

I. PROJECT DESCRIPTION

1. **State context.** Karnataka state in southwest India has an area of about 192,000 square kilometers and a population of about 64 million.¹ Economically, Karnataka is one of India's better-performing states—the per capita net income is about 50% above the national average, and grew at over 10% per year during fiscal year (FY) 2012 to FY2016.² The population density is lower than the national average, and the sex ratio (number of females to males) is 968 per 1,000 males, vs. the national average of 940.³ The unemployment and poverty rates are also lower than the national averages, and the state receives substantial foreign direct investment (third-highest nationally, after the National Capital Region and Maharashtra).

2. **Transport network.** In terms of transportation, however, the rail network in Karnataka state is rather sparse, with a route of only about 3,000 km, mostly on single line. Because of the steep terrain along the western hill range, the east–west rail connectivity is limited to just one line from Hassan in the hinterland to Mangalore on the west coast. The road network is therefore a critical element of the economic infrastructure. Under technical assistance (TA) of the Asian Development Bank (ADB) for the Karnataka State Highway Network Improvement, consultants completed a study for identifying a core road network (CRN) in the state, as given in the following table.⁴

Table 1: Core Road Length

Administrative Class	Total Kilometers
National Highways (NH)	4,491
State Highways (SH)	18,470
Major District Roads (MDR)	1,265
Total	24,226

Source: Government of Karnataka.

3. **Government strategy.** While economic development in Karnataka has been good, it has also been uneven, mainly focused around the capital region of Bengaluru and Mysuru, and the coastal towns of Mangaluru and Udupi. Given its relatively sparse rail network, Karnataka is heavily dependent on its road network for linkage between the rural and urban economies. In its state road policy (2009), the Government of Karnataka (GOK) recognizes the importance of road development as an engine of economic growth and proposes to develop all the state highways to two-lane width.⁵ To achieve this objective, the GOK has been using a combination of budgetary, public–private partnership (PPP), World Bank, and ADB financing to improve state roads. In 2001, the first Karnataka State Highways Improvement Project (KSHIP-I) was implemented with the support of the World Bank for \$360 million, addressing about 2,400 km of roads. The second project, KSHIP-II, is ongoing, which covers about 1,800 km of roads and has two parts: a World Bank \$350 million loan approved in 2011 and an ADB \$315 million loan approved in 2010.⁶ However, the development of the CRN roads requires further substantial funding estimated at \$1.7 billion, and the government has to support this process through a mix of funding sources.

¹ Government of Karnataka (GOK). 2015. Directorate of Economics and Statistics. <http://des.kar.nic.in/docs/sip/GSDP%202015-16AE.pdf>

² Government of India, Ministry of Finance. 2017. *Economic Survey, 2016–2017*. <http://indiabudget.nic.in/estatvol2.asp>.

³ Government of India. 2011. *Census*. http://censusindia.gov.in/2011-prov-results/data_files/india/Final_PPT_2011_chapter5.pdf

⁴ ADB. 2017. *Technical Assistance to India for Karnataka State Highway Network Improvement*. Manila.

⁵ Public Works Department – Karnataka. 2009. *Karnataka Road Sector Policy*. Bengaluru.

⁶ ADB. 2010. *Karnataka State Highway Improvement Project*. India.

4. **Impact and Outcome.** The impact will be improved mobility and access to economic opportunities, aligned with the Three-Year Action Agenda (2017–2018 to 2019–2020) of the Government of India. The outcome will be improved road transport efficiency and safety in Karnataka state.

5. Outputs

- (i) **Output 1: State highways upgraded.** At least 418 km of state highways will be upgraded under hybrid annuity contracts and designed to standard specifications of two lanes with paved shoulders or four lanes, depending on traffic volumes. Contracts will include 7-year performance-based maintenance obligations under a hybrid annuity contract structure. Under this format, 75% of the estimated cost of the project will be paid during the construction period at specified milestones. The balance of 25%, as well as costs of operations and maintenance during the 7-year post-construction period, will be paid as semi-annuity payments on meeting the road availability and performance parameters.
- (ii) **Output 2: Road safety measures on state highways installed.** Road safety audit conducted on all state highways in the CRN to identify critical accident spots, with suitable measures implemented to improve these accident spots. Accident mitigation measures are to be implemented for at least 12 identified accident spots.
- (iii) **Output 3: Institutional capacity and efficiency of the Karnataka Public Works, Ports, and Inland Water Transport Department improved.** ISO 9001:2015 (quality management system) and ISO 14001:2015 (environmental management system) certifications will be processed for the division and sub-division levels in KPWD, across Karnataka. For the project, a public response system and a complaint handling mechanism will be instituted.

II. IMPLEMENTATION PLANS

A. Project Readiness Activities

Table 2: Indicative Action Timeline

Indicative Activities	Months								Responsible Individual/Unit/ Agency/ Government
	Jun/ Aug 2017	Sept 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	
Advance contracting actions	X								PIU
Land acquisition and R&R actions	X								PIU
Retroactive financing actions								X	PIU
Establish project implementation arrangements				X					PIU
ADB Board approval					X				ADB
Loan signing						X			Government/ ADB

Indicative Activities	Months								Responsible Individual/Unit/ Agency/ Government
	Jun/ Aug 2017	Sept 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	
Government legal opinion provided						X			Government/ ADB
Government budget inclusion		X							Government (ongoing)
Loan effectiveness							X		Government/ ADB

ADB = Asian Development Bank, PIU = Project Implementation Unit of Karnataka State Highways Improvement Project, R&R = resettlement and rehabilitation.

Source: Asian Development Bank.

B. Overall Project Implementation Plan

Table 3: Gantt Chart of Implementation Activities

	2017				2018				2019				2020				2021				2022				2023			
	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND
A. DMF Activities																												
1. Output 1 - State Highways Upgraded																												
1.1. Land acquisition and R&R actions																												
1.2. Award and mobilize independent engineering consultants																												
1.3. Award contracts for about 400 km of SHs																												
1.4. Construction of SHs																												
2. Output 2 - Road Safety Improved																												
2.1. Conduct road safety audit																												
2.2. Implement safety actions																												
3. Output 3 - Institutional Capacity Improved																												
3.1. Public response and complaint handling mechanism																												
3.2. Certification documentation and audit for ISO 9001:2015																												
3.3. Certification documentation and audit for ISO 14001:2015																												
B. Management Activities																												
Procurement plan key activities to procure contract packages																												
Consultant selection procedures																												
Environment management plan key activities																												
Mid-term review																												
Project completion report																												

DMF = design and monitoring framework, km = kilometer, R&R = resettlement and rehabilitation, SH = state highways.
 Source: Asian Development Bank.

III. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations: Roles and Responsibilities

Table 4: Implementation Roles and Responsibilities

Project Implementation Organizations	Management Roles and Responsibilities
Executing Agency Karnataka Public Works, Ports, and Inland Water Transport Department (KPWD)	<ul style="list-style-type: none"> • Compliance with all loan covenants (road sector reforms, social and environmental safeguards, financial, economic, and others) • Providing funds and staffing as per the commitments/assurances on the institutional development component • Timely provision of agreed counterpart funds for project activities • Establishing a strong financial management system and conducting timely financial audits based on the agreed timeframe, and taking recommended actions • Overseeing the performance of the project implementation unit (PIU) of the Karnataka State Highways Improvement Project (KSHIP) • Ensuring project sustainability during post-implementation stage and reporting to ADB on the assessed development impacts • Interagency coordination
Implementing Agency Project Implementation Unit of Karnataka State Highways Improvement Project (PIU)	<ul style="list-style-type: none"> • Conducting preconstruction activities • Recruiting independent engineer consultants (IEC), nongovernment organization (NGO) consultants, monitoring and evaluation (M&E) consultants, safety consultants, and institutional development support (IDS) consultants • Recruiting contractors • Monitoring and evaluation of project activities and outputs, including periodic review, preparation of review reports reflecting issues and time-bound actions taken (or to be taken) • Involving beneficiaries/representatives in all stages of project development and implementation • Public disclosure of project outputs • Quality assurance of works and services of consultants and counterpart staff • Submitting timely withdrawal applications to ADB • Compliance with all loan covenants (road sector reforms, social and environmental safeguards, financial, economic, and others) • Preparing regular periodic progress reports, and project completion reports and their timely submission to ADB
Asian Development Bank (ADB)	<ul style="list-style-type: none"> • Providing timely guidance at each stage of the project for smooth implementation in accordance with the agreed implementation arrangements • Reviewing all documents that require ADB approval • Conducting periodic loan review missions, a midterm review, and a completion mission • Ensuring compliance with all loan covenants (institutional strengthening, social and environmental safeguards, financial, economic, and others) • Timely processing of withdrawal applications and release of eligible funds • Ensuring compliance with financial audit recommendations • Regular update of the project performance review reports with the assistance of the PIU

- | | |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • Regular posting on ADB website of updated project information documents for public disclosure, and the safeguards documents as per the disclosure provision of the ADB Safeguard Policy Statement |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

B. Key Persons Involved in Implementation

Executing Agency

Karnataka Public Works, Ports,
and Inland Water Transport
Department (KPWD)

Mr. M. Lakshminarayana, I.A.S.
Position: Additional Chief Secretary to Government of
Karnataka
Telephone: +91 80 22251449
Email address: prs.pwd@gmail.com
Office address: Public Works, Ports & Inland Water
Transport Department, #336, 3rd Floor, Vikasa Soudha
Bengaluru – 560001

Implementing Agency

Project Implementation Unit,
Karnataka State Highway
Improvement Project,
Public Works Department

Mr. Manivannan P., I.A.S.
Position: Chief Project Officer
Telephone: +91 80 22249981
Email address: cpopiukship@gmail.com
Office address: Project Implementation Unit, 1st Floor,
PWD Annex building, K R Circle
Bengaluru – 560001

Asian Development Bank

South Asia Transport and
Communications Division
(SATC)

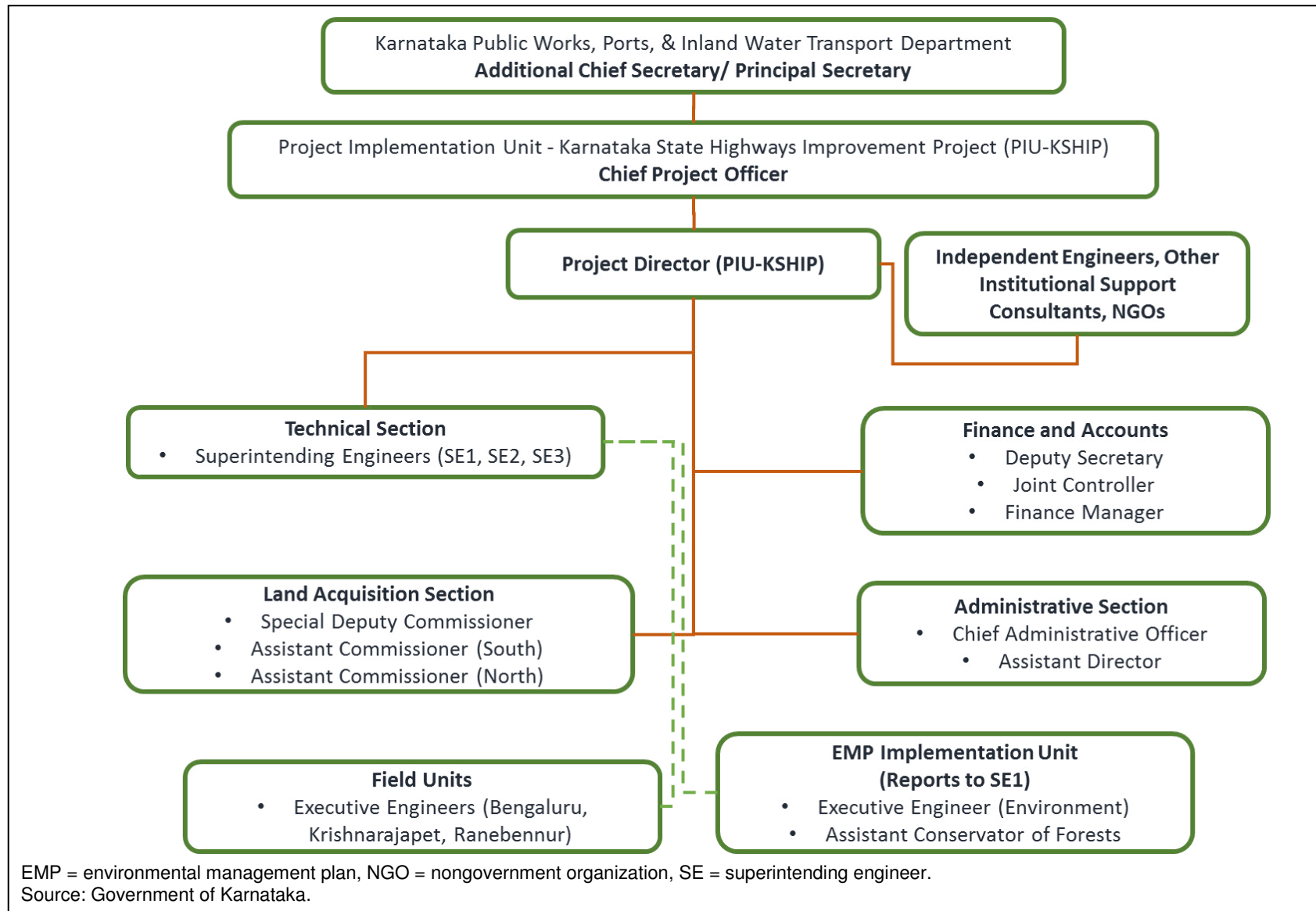
Dong-Kyu Lee
Position: Officer-In-Charge
Telephone: +63 2 632 4157
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Mission Leader

Ravi Peri
Position: Principal Transport Specialist
Telephone: +63 2 683 1771
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C. Project Organization Structure

Figure 1. Project Organization Structure



IV. COSTS AND FINANCING

6. ADB will finance \$346 million, which is 53% of the total project cost, while the Government of Karnataka will finance \$202 million, which is 31% of the total project cost. The private sector, through hybrid annuity contracts, will finance \$107 million, which is the balance of 16% of the total project cost. ADB's financing will be related to the following components: (i) upgrading of state highways; (ii) road safety audit and measures to improve accident spots; (iii) consulting services related to these aspects; and (iv) consulting services related to improving institutional capacity and efficiency. ADB will also finance taxes and duties that (i) are within the reasonable threshold identified during the country partnership strategy (CPS) preparation process; (ii) represent about 4% of the investment plan; and (iii) apply only to ADB-financed expenditures. The financing of the taxes and duties is considered material and relevant to the success of the project. In addition to financing a proportionate share for the above components, the Government of Karnataka will finance all costs related to (i) land acquisition; (ii) rehabilitation and resettlement; (iii) operation and maintenance works; (iv) project management; (v) interest during construction; and (vi) commitment charges. Detailed component-wise tabulations are given in subsequent tables.

A. Cost Estimates Preparation and Revisions

7. Cost estimates were prepared by a set of technical consultants recruited by the PIU for preparing detailed project reports, and reviewed by the PIU staff. ADB recruited consultants under a project preparatory technical assistance (PPTA) to conduct a due diligence exercise. The basic cost data for the project are based on a *Schedule of Rates for Roads and Bridges of National Highway* published periodically by the Government of Karnataka, January 2017 prices, updated from time to time. During implementation, the schedule of rates (if any), along with the then current normalized bid rates, will be updated by the PIU on an annual basis, and used for assessing project estimates and bid responses.

B. Key Assumptions

8. The following key assumptions underpin the cost estimates and financing plan:

- (i) Exchange rate: ₹65.12 = \$1.00 (as of 21 October 2017).
- (ii) Price contingencies based on expected cumulative inflation over the implementation period are as follows:

Table 5: Escalation Rates for Price Contingency Calculation
(%)

Item	2017	2018	2019	2020	2021	2022	Average
Foreign rate of price inflation	2.9	4.5	6.0	7.6	9.1	10.6	6.8
Domestic rate of price inflation	5.80	11.30	16.80	22.30	27.80	33.30	19.55

Sources: Asian Development Bank. International and Domestic Cost Escalation Factors 2017–2021; Asian Development Bank estimates for 2019–2022.

C. Detailed Cost Estimates by Expenditure Category

Table 6: Summary Cost Estimates
(\$ million)

Item	Amount ^a
A. Base Cost^b	
1. State highways upgraded	594.00
2. Road safety on state highways installed	12.00
3. Institutional capacity and efficiency of KPWD improved	9.00
Subtotal (A)	615.00
B. Contingencies^c	18.00
C. Financing Charges During Implementation^d	22.00
Total (A+B+C)^e	655.00

KPWD = Karnataka Public Works, Ports, and Inland Water Transport Department.

^a Includes taxes and duties of about \$27 million. The government and the Asian Development Bank (ADB) will finance taxes and duties of about \$27 million by cash contribution for civil works to upgrade state highways and improve road safety. The taxes and duties to be financed by ADB (i) are within the reasonable threshold identified during the country partnership strategy preparation process; (ii) represent only 4% of the investment plan; (iii) apply only to ADB-financed expenditures; and (iv) are considered material and relevant to the success of the project.

^b In mid-2017 prices as of January.

^c Physical contingencies computed at 2% for civil works. Price contingencies computed at 2% of local currency costs.

^d Includes interest and commitment charges. Interest during construction for the ordinary capital resources loan(s) is computed at the 5-year fixed swap rate plus a spread of 0.5% and maturity premium of 0.10%. Commitment charges for an ordinary capital resources loan are 0.15% per year on the undisbursed loan amount.

^e The summary of cost estimates is exclusive of the operation and maintenance, and interest payments to be paid to the concessionaire by the State Government, after construction completion.

Source: Asian Development Bank estimates.

D. Allocation and Withdrawal of Loan Proceeds

Table 7: Allocation and Withdrawal of Loan Proceeds

Sl. No.	Item	Amount Allocated Category (\$)	Percentage of ADB Financing from the Loan Account
1	Works	307,000,000	75% of total expenditure claimed
2	Road Safety Component	12,000,000	100% of total expenditure claimed
3	Consulting Services	13,500,000	100% of total expenditures claimed
4	Unallocated	13,500,000	
	Total	346,000,000	

ADB = Asian Development Bank.

Source: Asian Development Bank estimates.

E. Detailed Cost Estimates by Financier

Table 8: Detailed Cost Estimates by Financier
(\$ million)

Component	Total	ADB		GOK		Private Sector	
		%	Amount	%	Amount	%	Amount
A. Land acquisition, resettlement and rehabilitation, utility shifting, tree planting	171.00	0	0.00	100	171.00	0	0.00
B. Hybrid Annuity Contracts	409.00	75	306.75	0	0.00	25	102.25
Kollegal - Hannur; Chintamani - Andhra border;							
1 Bengaluru to NH-48 via Magadi	135.61						
2 Magadi - Somwarpath	151.21						
3 Gadag - Honnali	122.12						
C. Road Safety Works	12.00	100	12.00	0	0.00	0	0.00
D. Consulting Services	18.00	75	13.50	0	0.00	25	4.50
Independent Engineer(s)	9.00	50	4.50	0	0.00	50	4.50
Other (Institutional and Support)	9.00	100	9.00	0	0.00	0	0.00
E. Project Management	5.00	0	0.00	100	5.00	0	0.00
Subtotal A-E	615.00	54	332.25	29	176.00	17	106.75
F. Contingencies							
1. Physical	9.00	75	6.75	25	2.25	0	0.00
2. Price	9.00	75	6.75	25	2.25	0	0.00
Subtotal Contingencies	18.00	75	13.50	25	4.50	0	0.00
G. Financing Charges							
1. IDC	20.00	0	0.00	100	20.00	0	0.00
2. Commitment Charges	2.00	0	0.00	100	2.00	0	0.00
Subtotal Financing Charges	22.00	0	0.00	100	22.00	0	0.00
TOTAL	655.00	53	346.00	31	202.00	16	107.00

ADB = Asian Development Bank, GOK = Government of Karnataka, IDC = interest during construction, NH = national highway.

Note: Numbers may not sum precisely because of rounding.

Sources: Public Works Department – Karnataka; Asian Development Bank.

F. Detailed Cost Estimates by Year

Table 9: Detailed Cost Estimates by Year
(\$ million)

Component	Total	2018	2019	2020	2021	2022	2023	2024
A. Land acquisition, resettlement and rehabilitation, utility shifting, tree planting	171.00	59.85	59.85	51.30	0.00	0.00	0.00	0.00
B. Hybrid Annuity Contracts	409.00	8.18	61.35	73.62	81.80	102.25	81.80	0.00
Kollegal - Hannur; Chintamani - Andhra border;								
1 Bengaluru to NH-48 via Magadi	135.61							
2 Magadi - Somwarpeth	151.21							
3 Gadag - Honnali	122.12							
C. Road Safety Works	12.00	0.00	0.00	1.20	3.60	6.00	1.20	0.00
D. Consulting Services	18.00	0.00	0.00	1.80	5.40	9.00	1.80	0.00
Independent Engineer(s)	9.00							
Other (Institutional and Support)	9.00							
E. Project Management	5.00	0.10	0.75	0.90	1.00	1.25	1.00	0.00
Subtotal A-E	615.00	68.13	121.95	128.82	91.80	118.50	85.80	0.00
F. Contingencies								
1. Physical	9.00	0.18	1.35	1.62	1.80	2.25	1.80	0.00
2. Price	9.00	0.18	1.35	1.62	1.82	2.25	1.77	0.00
Subtotal Contingencies	18.00	0.36	2.70	3.24	3.62	4.50	3.57	0.00
G. Financing Charges								
1. IDC	20.00	0.02	0.82	2.28	4.02	5.96	6.90	0.00
2. Commitment Charges	2.00	0.34	0.60	0.48	0.34	0.19	0.05	0.00
Subtotal Financing Charges	22.00	0.36	1.41	2.76	4.37	6.15	6.95	0.00
TOTAL	655.00	68.85	126.06	134.82	99.78	129.15	96.32	0.00

ADB = Asian Development Bank, GOK = Government of Karnataka, IDC = interest during construction, NH = national highway

Note: Numbers may not sum precisely because of rounding.

Sources: Public Works Department – Karnataka; Asian Development Bank.

G. Detailed Cost Estimates by Outputs

Table 10: Detailed Cost Estimates by Outputs
(\$ million)

Component	Total	Output 1: Rehabilitation of Roads		Output 2: Road Safety		Output 3: Institutional	
		%	Amount	%	Amount	%	Amount
A. Land acquisition, resettlement and rehabilitation, utility shifting, tree planting	171.00	100	171.00	0	0.00	0	0.00
B. Hybrid Annuity Contracts	409.00	100	409.00	0	0.00	0	0.00
Kollegal - Hannur; Chintamani - Andhra border;							
1 Bengaluru to NH-48 via Magadi	135.61						
2 Magadi - Somwarpeth	151.21						
3 Gadag - Honnali	122.12						
C. Road Safety Works	12.00	0	0.00	100	12.00	0	0.00
D. Consulting Services	18.00	56	10.00	0	0.00	44	8.00
Independent Engineer(s)	9.00						
Other (Institutional and Support)	9.00						
E. Project Management	5.00	100	5.00	0	0.00	0	0.00
Subtotal A-E	615.00	97	595.00	2	12.00	1	8.00
F. Contingencies							
1. Physical	9.00	100	9.00	0	0.00	0	0.00
2. Price	9.00	100	0.00	0	0.00	0	0.00
Subtotal Contingencies	18.00	100	18.00	0	0.00	0	0.00
G. Financing Charges							
1. IDC	20.00	100	20	0	0.00	0	0.00
2. Commitment Charges	2.00	100	2	0	0.00	0	0.00
Subtotal Financing Charges	22.00	100	22	0	0.00	0	0.00
TOTAL	655.00	96.95	635.00	1.83	12.00	1.22	8.00

ADB = Asian Development Bank, GOK = Government of Karnataka, IDC = interest during construction, NH = national highway.

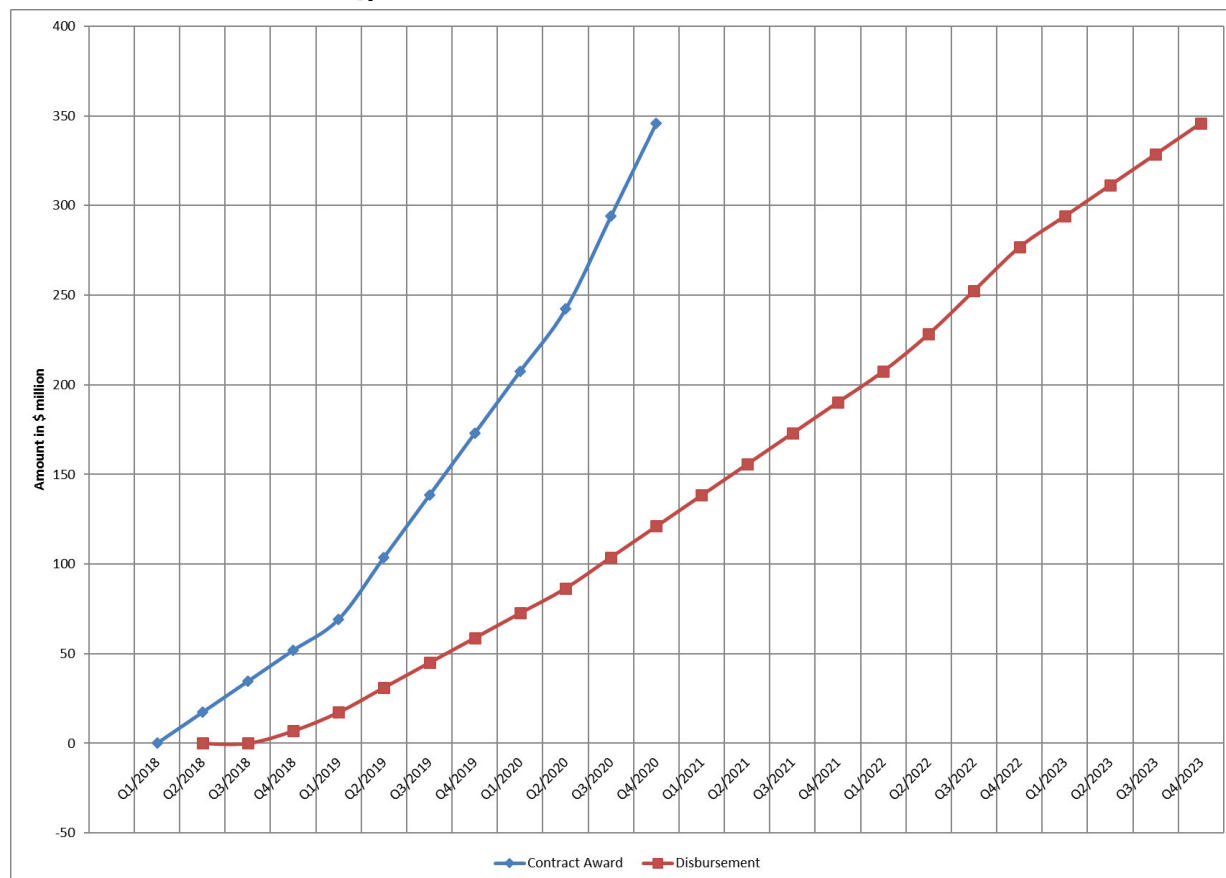
Note: Numbers may not sum precisely because of rounding.

Sources: Public Works Department – Karnataka; Asian Development Bank.

H. Contract and Disbursement S-Curve

9. The following graph shows contract awards and disbursements for the allocated amounts over the life of the project, on a quarterly basis, based on the contract awards and disbursement projections.

Figure 2. Contract and Disbursement S-Curve



Source: Asian Development Bank estimates.

10. Table 11 indicates the same details of contract awards and disbursements for the allocated amounts over the life of the project, on a quarterly basis, based on the contract awards and disbursement projections.

Table 11: Contracts and Disbursement Tabulation

Quarter/Year	Cumulative Award (\$ million)	Cumulative Disbursement (\$ million)
Q1/2018	0	0
Q2/2018	17	0
Q3/2018	35	0
Q4/2018	52	7
Q1/2019	69	17
Q2/2019	104	31
Q3/2019	138	45

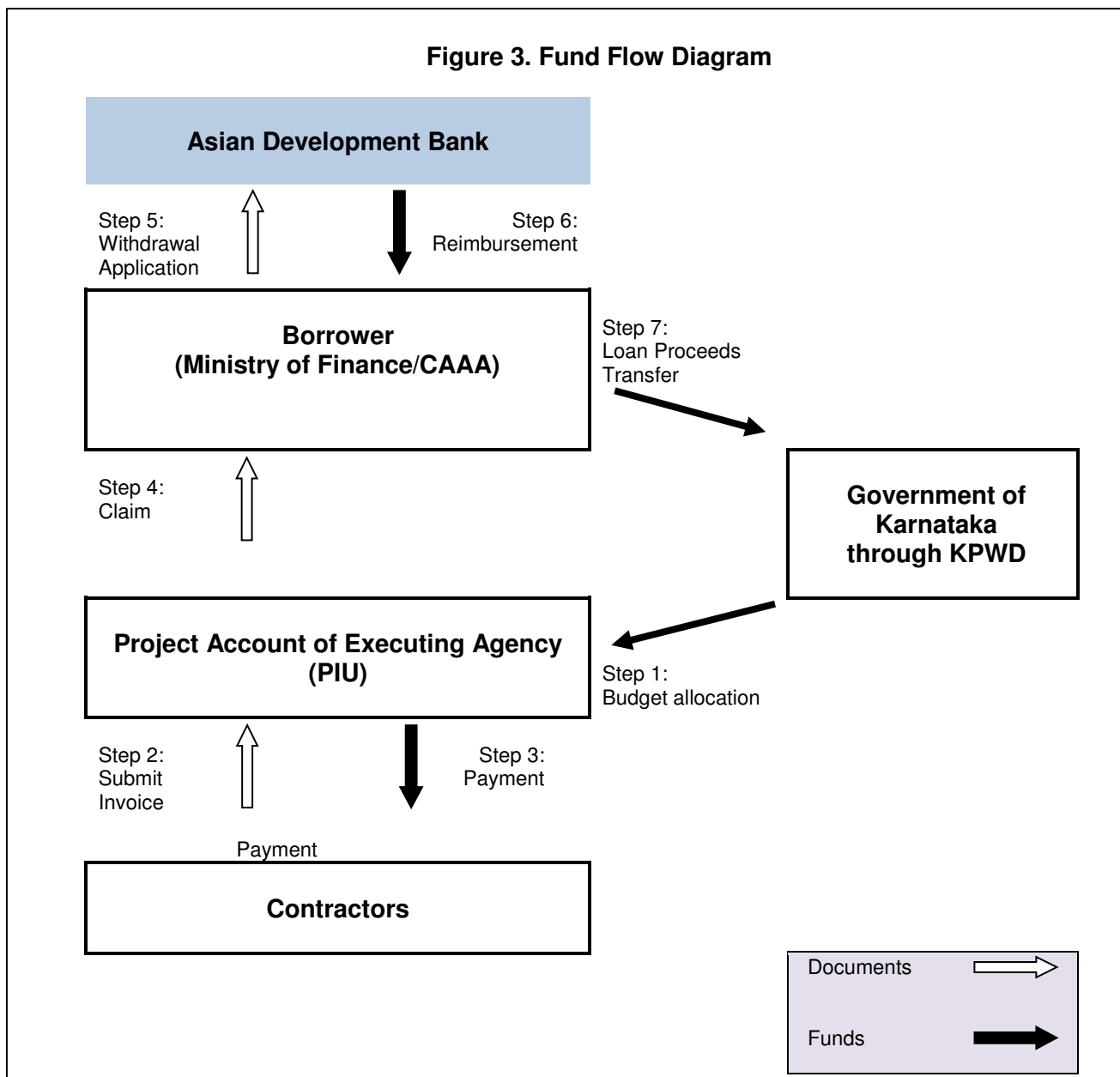
Quarter/Year	Cumulative Award (\$ million)	Cumulative Disbursement (\$ million)
Q4/2019	173	59
Q1/2020	208	73
Q2/2020	242	87
Q3/2020	294	104
Q4/2020	346	121
Q1/2021		138
Q2/2021		156
Q3/2021		173
Q4/2021		190
Q1/2022		208
Q2/2022		228
Q3/2022		253
Q4/2022		277
Q1/2023		294
Q2/2023		311
Q3/2023		329
Q4/2023		346

Q = quarter.

Source: Asian Development Bank estimates.

I. Fund Flow Diagram

11. Disbursement methods as outlined in ADB's Loan Disbursement Handbook (2017) will also be adopted for the project. As the main disbursement method, the loan will adopt the reimbursement method for payments. The GOK will provide the ADB loan and counterpart funds to the PIU for project implementation, ensuring sufficient budget for payments to the contractors based on the submitted invoices. The PIU will then submit claims to the borrower, who will in turn submit them to ADB. ADB will pay the borrower out of the loan and the borrower will provide additional central assistance to the PIU through the GOK. The GOK will be responsible for meeting the financial responsibilities and obligations of the PIU for the project. The following diagram shows how the funds will flow from ADB and the borrower to implement project activities. Section V.B indicates more details on the disbursement mechanism.



CAAA = controller of aid accounts and audit, KPWD = Karnataka Public Works, Ports, and Inland Water Transport Department, PIU = Project Implementation Unit of Karnataka State Highways Improvement Project.
Source: Asian Development Bank.

V. FINANCIAL MANAGEMENT

12. The implementing agency, the PIU, was set up as a special purpose unit to implement projects of multilateral banks. The PIU is like a division of the KPWD and under its administrative authority, but it has a fairly autonomous function. The PIU will maintain a separate account for the project. Financial management risks will be considered and updated throughout the life of the project. Risk mitigation measures will also be updated accordingly.

A. Financial Management Assessment

13. The financial management assessment (FMA) was conducted in June 2016 in accordance with ADB's Guidelines for the Financial Management and Analysis of Projects (2005) and the Financial Due Diligence: A Methodology Note (2009). The FMA considered the capacity of the PIU, including fund flow arrangements, staffing, accounting and financial reporting systems, financial information systems, and internal and external auditing arrangements. Based on the assessment, the capacity of the PIU is considered adequate in project financial accounting and in ADB disbursement procedures. The PIU has been the executing agency for previous ADB and World Bank loans and the assessment of its prior performance in financial management indicates the PIU's capacity with respect to auditing requirements, including timely submission of audited project financial statements, which has been good. Major concerns have not been identified. As the fund flows are entirely through the budgetary process and government treasury, all transactions are recorded as per government accounting systems and ultimately reflected in the state government accounts. These are subject to statutory audit by the Comptroller and Auditor General (CAG) of India in line with constitutional provisions in India. The audited accounts are placed before the state legislature.

14. In addition, transaction audits are also carried out periodically during the year by the Accountant General (an arm of the CAG at the state level) to ensure conformity with the relevant codes and standards. Apart from these, the KSHIP also prepares quarterly financial statements for individual projects of multilateral agencies as well as annual statements. A financial management system based on the off-the-shelf accounting software Tally is used. A firm of chartered accountants has been appointed to carry out internal audit in line with the requirements of the World Bank and ADB. Annual statements of project accounts are subject to audit by the Accountant General based on the Auditing Standards promulgated by the CAG. A review of the audits from FY2013 to FY2016 indicates no major adverse audit comment. However, a key weakness that has been identified is the vacancy in the financial oversight positions in the PIU, which are to be staffed by government officers. Due to this circumstance, the risk of financial management has been rated as *Moderate*. Certain action points have been identified and set out in Table 12.

Table 12: Action Points on Financial Risk

Risk	Activities to Mitigate	Responsibility	Timeline
Fund flow: Counterpart funds for the project (implementation and hybrid annuity payments) are not available on time.	Assurances are placed in the project agreements that counterpart funds for the project (implementation and hybrid annuity contract payments) will be made available on time.	GOK	At the time of loan negotiations
Reporting and monitoring: Funds received from government for implementation and hybrid annuity contract payments are not segregated and maintained.	Records of fund flow for the project need to be maintained separately.	PIU	Commencing from Q1 2018

Risk	Activities to Mitigate	Responsibility	Timeline
Human resources: Key financial management positions are not staffed.	Key positions need to be staffed.	GOK, PIU	From FY2018

ADB = Asian Development Bank, FY = fiscal year, GOK = Government of Karnataka, PIU = Project Implementation Unit of Karnataka State Highways Improvement Project, Q = quarter.

Source: Asian Development Bank.

B. Disbursement

Disbursement Arrangements for ADB Funds

15. The loan proceeds will be disbursed in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time) and the detailed arrangements agreed upon between the government and ADB.⁷ Online training for project staff on disbursement policies and procedures is available.⁸ Project staff are encouraged to avail of this training to help ensure efficient disbursement and fiduciary control.

16. **Statement of expenditure procedure.** The statement of expenditure (SOE) procedure may be used for reimbursement of eligible expenditures or liquidation of advances to the advance account(s). Supporting documents and records for the expenditures claimed under the SOE should be maintained and made readily available for review by ADB's disbursement and review missions, upon ADB's request for submission of supporting documents on a sampling basis, and for independent audit.⁹

17. Neither ADB's advance fund nor direct payment procedures will be used for the project.

18. The PIU will be responsible for (i) preparing disbursement projections, (ii) requesting budgetary allocations for counterpart funds, (iii) collecting supporting documents, and (iv) preparing and sending withdrawal applications to ADB.

19. Before the submission of the first withdrawal application, the government should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the borrower, together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is set in accordance with ADB's Loan Disbursement Handbook. Individual payments below this amount should generally be paid by the PIU and subsequently claimed to ADB through reimbursement. ADB reserves the right not to accept withdrawal applications below the minimum amount.

20. Withdrawal applications and supporting documents will demonstrate, among other things, that the goods and/or services were produced in or from ADB members, and are eligible for ADB financing.

21. All disbursements under government financing will be carried out in accordance with the regulations of the Government of India and the State Government of Karnataka and accounting principles acceptable to ADB.

⁷ The handbook is available electronically from the ADB website (<http://www.adb.org/documents/loan-disbursement-handbook>).

⁸ Disbursement eLearning: http://wpqr4.adb.org/disbursement_elearning.

⁹ SOE forms are available in Appendix 7B and 7D of ADB's Loan Disbursement Handbook (2017, as amended from time to time).

C. Accounting

22. The PIU will maintain separate project financial statements and records by funding source for all expenditures incurred on the project. Project financial statements will follow accounting principles and practices prescribed by the government's accounting laws and regulations.¹⁰

D. Auditing and Public Disclosure

23. The PIU will cause the detailed consolidated project financial statements to be audited in accordance with the government's audit regulations by an auditor appointed by the Auditor General, which is acceptable to ADB. The audited financial statements will be submitted in the English language to ADB within 6 months of the end of the fiscal year by the executing agency.

24. The annual audit report for the project financial statements will include an audit opinion, which cover (i) whether the project financial statements present a true and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting framework; (ii) whether loan proceeds were used only for the purposes of the project or not; and (iii) the level of compliance for each financial covenant contained in the legal agreements for the project. If a management letter is prepared by the auditor, this shall also be submitted to ADB.

25. To ensure the timely submission of audited project financial statements, the PIU shall formally request the CAG to include the audit of the project accounts in their yearly work plan. Unaudited project financial statements should be submitted to the CAG for audit within 3 months of the end of the fiscal year.

26. The government and the PIU have been made aware of ADB's policy on delayed submission of audited project financial statements, and the requirements for the statements being of satisfactory and acceptable quality.¹¹ If the audits required are not conducted in a manner satisfactory to ADB, or if the audits are substantially delayed, then ADB reserves the right to require an additional auditor, as mutually agreed with the borrower, to complete the audit in a satisfactory and timely manner. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures.

27. Compliance with financial reporting and auditing requirements will be monitored by review missions and during normal program supervision, and followed up regularly with all concerned, including the external auditor.

28. Public disclosure of the project financial statements, including the audit report on the

¹⁰ Government laws and regulations, and following Indian Generally Accepted Accounting Principles.

¹¹ Following is ADB's policy on delayed submission of audited project financial statements:

- (i) When audited project financial statements are *not received by the due date*, ADB will write to the executing agency advising that (i) the audit documents are overdue; and (ii) if they are not received within the next 6 months, requests for new contract awards and disbursement such as new replenishment of imprest accounts, processing of new reimbursement, and issuance of new commitment letters will not be processed.
- (ii) When audited project financial statements *have not been received within 6 months after the due date*, ADB will withhold processing of requests for new contract awards and disbursement such as new replenishment of imprest accounts, processing of new reimbursement, and issuance of new commitment letters. ADB will (i) inform the executing agency of ADB's actions; and (ii) advise that the loan may be suspended if the audit documents are not received within the next 6 months.
- (iii) When audited project financial statements *have not been received within 12 months after the due date*, ADB may suspend the loan.

project financial statements, will be guided by ADB's Public Communications Policy (2011).¹² After review, ADB will disclose the project financial statements for the project and the opinion of the auditors on the financial statements within 14 days of ADB'S confirmation of their acceptability by posting them on ADB's website. The Audit Management Letter will not be disclosed.

VI. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting and Retroactive Financing

29. All advance contracting and retroactive financing will be undertaken in conformity with ADB's Procurement Guidelines (2015, as amended from time to time) and ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).^{13,14} The issuance of invitations to bid under advance contracting and retroactive financing will be subject to ADB approval. The borrower, the Government of Karnataka, and the PIU have been advised that approval of advance contracting and retroactive financing does not commit ADB to finance the project.

30. **Advance contracting.** The PIU has requested advance action to expedite the consultant selection process, including finalization of the request for proposals and evaluation and procurement of works under hybrid annuity contracts, as well as preparation of bidding documents and call for tenders.

31. **Retroactive financing.** The PIU has requested approval for retroactive financing. If approved by the Board, the reimbursement of eligible expenditures under the loan, subject to a maximum amount of 20% of the loan amount, may be made before the effective date but not earlier than 12 months before the signing of the loan and project agreements.

B. Procurement of Goods, Works, and Consulting Services

32. All procurement of goods and works will be undertaken in accordance with ADB's Procurement Guidelines.

33. The PIU and ADB have discussed procurement packages and procedures and understood that the proposed project involves mainly international competitive bidding (ICB), although one package is under national competitive bidding (NCB). The procurement plan should be updated whenever change in the procurement arrangements is required and agreed.

34. An 18-month procurement plan indicating threshold and review procedures, goods, works, and consulting service contract packages and NCB guidelines is cited in section VI.C.

35. Procurement activities under the PIU will be the responsibility of the Chief Project Officer (CPO), who will be supported by the Project Director, Superintending Engineer, and other staff and consultants. ADB will closely monitor all major project implementation activities. Contracts for civil works will comprise three ICB packages. All contracts for civil works and goods will be procured in accordance with ADB's Procurement Guidelines.

36. All consultants will be recruited according to ADB's Guidelines on the Use of

¹² Available at <http://www.adb.org/documents/pcp-2011?ref=site/disclosure/publications>

¹³ Available at <http://www.adb.org/Documents/Guidelines/Procurement/Guidelines-Procurement.pdf>

¹⁴ Available at <http://www.adb.org/Documents/Guidelines/Consulting/Guidelines-Consultants.pdf>

Consultants.¹⁵ The terms of reference for all consulting services are cited in section VI.D.

37. Consulting services are required to facilitate project management and implementation. Independent Engineering Consultants (IEC) will be funded out of loan proceeds. As per the hybrid annuity contracts, the IEC for each contract will be funded 50:50 each by the KPWD and the hybrid annuity contractor. After the availability period of the loan, the KPWD will continue to make any residual payments out of its own funds. For the consultants for road safety audit and implementation support, the funds will be met entirely out of loan funds. The expertise requirements of consultants are given in the relevant sections of the terms of reference in Attachment 5 of this PAM. Consulting firms will be engaged using the quality- and cost-based selection (QCBS) method with a standard quality:cost ratio of 80:20.

38. The PIU will institute a referencing system in record keeping. All procurement files, including bid invitations, winning bids, evaluation reports, pre-contract documents, contract documents, and invoices, will be kept in single contract files. The government regulations require keeping all records for 8 years, which sufficiently cover the ADB requirement to keep the project records for 2 years after project completion, considering that all projects under the proposed loan are envisioned to be completed within 3–4 years following procurement activities.

C. Procurement Plan

39. The procurement plan is in Attachment 1 of this PAM and describes all procurement of good and works to be undertaken for the project based on the procurement capacity assessment undertaken separately for the PIU.

D. Consultant's Terms of Reference

40. The terms of reference for the independent engineering consultants are given in the Attachment 5A of this PAM. The terms of reference of the road safety audit consultant are given in Attachment 5B. In addition, an implementation support consultant (ISC) will assist the PIU with contract management, safeguards, financial management, and accounts. The terms of reference of the ISC (national) are given in Attachment 5C.

VII. SAFEGUARDS

41. Pursuant to ADB's Safeguard Policy Statement (SPS 2009), ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS.¹⁶

A. Environmental Safeguards

42. The project is categorized as *B* based on ADB's Safeguard Policy Statement as the project scope involves the improvement of existing state highways (SH) to standard two lanes SH. The project roads do not pass through any environmentally sensitive areas, and no significant and irreversible environmental impacts are expected. Initial environmental examination (IEE) reports, including an environmental management plan (EMP) and environmental monitoring plan (EMOP), have been prepared for the five project roads.

¹⁵ Checklists for actions required to contract consultants by method are available in the e-Handbook on Project Implementation at <http://www.adb.org/documents/handbooks/project-implementation/>

¹⁶ Available at <http://www.adb.org/sites/default/files/pub/2009/Safeguard-Policy-Statement-June2009.pdf>

43. The EMP is a plan for mitigating all anticipated environment impacts during project construction and operation. Specific mitigation measures with details on location, time, and the responsible agency for implementation are given in the EMP. The EMOP is a plan for monitoring the quality of air, water, noise, and soil. The contractor will outsource these monitoring activities to laboratories that are approved by the National Accreditation Board for Laboratories (NABL). The PIU will carry out the compensatory afforestation activities and maintenance or through specialized agencies that can carry out tree plantation, maintenance, monitoring, and reporting.

44. No environmental clearance is required for any of the five project roads. Forestry clearance for diversion of forest land will be required for three roads: (i) Chintamani to Andhra Pradesh border, (ii) Magadi to Somwarpet, and (iii) Gadag to Honnali. Clearance from the Archeological Survey of India (ASI) is required for the Magadi to Somwarpet road because of the presence of two ancient temples near the road in Ramanathapura.¹⁷ Cutting of trees is required for all five roads. The clearances and tree cutting permits will be processed and obtained by the PIU before the start of construction works in the respective road sections. Permits, certificates, no-objection letters, etc., for activities such as operation of hot mix plants, operation of equipment and machinery, sourcing of ground water, etc., must be obtained by the contractor before the implementation of the respective construction activity.

45. The EMP for all project roads will be attached to the respective contract documents. The responsibilities of the respective parties and agencies on implementing the environmental safeguards are given below:

- **PIU.** The Environmental Management Plan Implementation Unit (EMPIU) under the PIU has an executive engineer for environment and an assistant conservator of forests.¹⁸ An assistant executive engineer will be recruited to assist the environment engineer. The EMPIU will ensure compliance with all environmental safeguard requirements as stated in the IEE, EMP, EMOP, and loan covenants for the project. Specifically, the EMPIU will (i) conduct periodic site inspections; (ii) review and approve quarterly environmental monitoring reports submitted by the independent engineering consultants (IEC); (iii) review and approve annual environmental monitoring reports submitted by the IEC team and submit these to ADB for disclosure on the ADB website; (iv) process the forestry and ASI clearance and the tree cutting permit as stated above; and (v) implement the compensatory afforestation program in partnership as provided in the IEE.
- **Implementation support consultant (ISC).** The ISC will have an Environmental Specialist to assist the EMPIU in overseeing the implementation of environmental safeguards. Support will be provided as necessary to the EMPIU in delivering their responsibilities as stated above.
- **Independent engineering consultant (IEC).** The IEC will have a team that includes a senior environmental specialist and junior environmental specialist for supervising environmental safeguard activities. They will be responsible for (i) regular site level monitoring; (ii) providing technical advice and on-the-job training to the contractor to enable smooth implementation of the EMP; (iii) updating the EMP as necessary; (iv) preparing quarterly monitoring reports and annual environmental monitoring reports

¹⁷ The two ancient temples are located 132 meters and 172 meters, respectively, from the centerline of the road.

¹⁸ The Assistant Conservator of Forests is deputized from the Department of Forests.

for submission to the PIU and for further submission to ADB for disclosure on the ADB website; and (v) providing necessary technical support to the EMPIU.

- **Concessionaire.** The concessionaire will appoint an environmental officer along with an environmental health and safety team to ensure proper implementation of the EMP in accordance with the contract agreement. They will be responsible for obtaining permits, no-objection certificates, consent to establish and operate, etc. for crushing plants, hot mix plants and other machinery in a timely manner, and for preparing monthly reports on EMP implementation for submission to the IEC.

46. An initial coordination cum training workshop will be organized by the ISC during the pre-construction stage and further during construction for the PIU and the IEC staff, and the concessionaires.

B. Social Safeguards

47. **Involuntary resettlement.** The project is categorized as A based on ADB's Involuntary Resettlement Safeguards because of its significant impacts, which will affect 24,244 persons and require 463.58 hectares of private land. The preferred approach to deal with private land and assets will be through direct purchase, following the provisions of Section 46 of India's Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act 2013) and ADB's Safeguard Policy Statement (para. 25, Involuntary Resettlement Requirement 2, Appendix 2, p. 48).¹⁹ As per ADB's SPS requirement, the fairness and transparency of the direct purchase approach will be independently monitored by a third-party appointed by ADB. Should direct negotiations fail, the involuntary safeguards standard requirement will be triggered. Five resettlement plans (RP) have been prepared and disclosed on ADB's website. The total budget required for direct purchase and the implementation of the resettlement plans and utility shifting is about \$171 million. The cost of direct purchase, resettlement activities, and utility shifting will be entirely borne by the Government of Karnataka.

48. **Indigenous peoples safeguards.** The project is categorized as C based on ADB's SPS. The roads do not cross customary or tribal land and the census survey confirmed that the few scheduled tribe (ST) households who are affected (5.5%) are mainstreamed in the wider society and share similar occupations and religious beliefs as non-ST households.

49. **Implementation arrangements for direct purchase and resettlement activities.** Direct purchase and resettlement activities will be implemented by the KSHIP's social development and resettlement cell, which will be composed of 17 staff.

50. **Social development and resettlement cell (SDRC).** The SDRC will comprise the following key staff: (i) one special deputy commissioner for land acquisition in charge of supporting

¹⁹ SPS Appendix 2, paragraph 25, p. 48: "Safeguard Requirements 2 does not apply to negotiated settlements, unless expropriation would result upon the failure of negotiations. Negotiated settlements help avoid expropriation and eliminate the need to use governmental authority to remove people forcibly. The borrower/client is encouraged to acquire land and other assets through a negotiated settlement wherever possible, based on meaningful consultation with affected persons, including those without legal title to assets. A negotiated settlement will offer adequate and fair price for land and/or other assets. The borrower/client will ensure that any negotiations with displaced persons openly address the risks of asymmetry of information and bargaining power of the parties involved in such transactions. For this purpose, the borrower/client will engage an independent external party to document the negotiation and settlement processes. The borrower/client will agree with ADB on consultation processes, policies, and laws that are applicable to such transactions; third-party validation; mechanisms for calculating the replacement costs of land and other assets affected; and record-keeping requirements."

direct purchase and land acquisition activities who will be stationed in Bangalore; (ii) one chief administrative officer; (iii) one assistant director for social welfare; and (iv) one resettlement and rehabilitation manager responsible for resettlement and rehabilitation activities. They will be supported by five social development officers (three stationed in the new division offices of Bangalore, Rannebennur, and Krishnarajpet, and two in the Bangalore head office) and eight social welfare inspectors (six stationed in the new division offices and two in the Bangalore head office). The SDRC will manage the internal monitoring system of direct purchase and resettlement activities, update the resettlement plans, and submit semi-annual social monitoring reports to ADB.

51. **Implementation support consultant (ISC).** The ISC will have a social specialist to assist the SRDC in overseeing the implementation of direct purchase and resettlement activities.

52. **Resettlement implementing agencies/NGOs.** Three resettlement implementation agencies have been recruited in March 2017 to facilitate the implementation of the five resettlement plans.²⁰ They will work as a link between the SDRC and the affected community, and conduct the following key tasks: (i) identify, verify, and update the census of affected households; (ii) develop micro plans in consultation with the project affected persons and the PIU staff; (iii) educate project affected persons on the entitlement matrix; (iv) assist affected households in identifying suitable alternate land for resettlement purpose; (v) prepare and distribute entitlement identity cards; (vi) assist affected persons in getting benefits from various government development programs; (vii) conduct the livelihood development program; (viii) help establish and set up the grievance redress committees; (viii) conduct ongoing consultations with affected persons with special attention to women and vulnerable groups; and (ix) set up and manage the internal monitoring system.

53. **Independent engineering consultant (IEC).** The IEC's team will include two social experts (one key expert and one non-key expert) who will be responsible for the following: (i) guide the implementation process of the direct purchase and resettlement activities; (ii) help set up an internal monitoring system; (iii) participate and monitor the project-level grievance redress committee; and (iv) support the preparation of the semi-annual social monitoring reports.

C. Grievance Redress Mechanism

54. The existing grievance redress mechanism (GRM) used for the KSHIP-I and KSHIP-II projects will be followed under KSHIP-III. The purpose of the GRM will be to receive and facilitate the resolution of affected people's concerns, complaints, and grievances about the social and environmental performance at the project level. The GRM will aim to provide a time-bound and transparent mechanism to voice and to resolve social and environmental concerns linked with the project. The project-specific GRM is not intended to bypass the government's own redress process, rather it is intended to address project affected people's concerns and complaints promptly, making the GRM readily accessible to all segments of affected persons and scaled to the risks and impacts of the project. Hence, depending on the nature and significance of the grievances or complaints, the GRM will comprise procedures to address grievances at the project site level and at the PIU level. More serious complaints that cannot be addressed at the PIU level will be forwarded to the respective grievance redress committee (GRC). Complainants may access the formal legal system at any time.

²⁰ Sahyadri Community Development and Women Empowerment Society, Sirsi; Bijapur Integrated Rural Development Society, Hunugund; and Swamy Vivekanand Samaj Seva Samsthe, Sutagatti.

55. In addition to the standard GRM described above, the project will build up on the experience of KSHIP-I and KSHIP-II and continue using its mobile and web-based grievance redress platform. The KSHIP has appointed a consultant with a fully-staffed Public Response Center that uses a 24/7 phone helpline and its project website to receive, quickly address, and efficiently follow up and monitor complaints and grievances. Complainants can submit their grievances in English or Kannada using mobile and SMS, landline, website, social media, and in writing to the Public Response Center. The status or resolution of grievances can be monitored by the KSHIP staff and the wider public at the website, www.kship.in/.

VIII. GENDER AND SOCIAL DIMENSIONS

56. **Gender.** The project is categorized as *some gender elements* (SGE) based on the Guidelines for Gender Mainstreaming Categories of ADB Projects (2012, updated). Pedestrian and gender-sensitive measures have been integrated to maximize project benefits. Table 13 lists these measures and the institutions responsible for implementation.

Table 13: Gender Actions

Activity		Responsibility
1	Integrate pedestrian-friendly features into road design such as bus shelters, well-marked crossings, safety signage, pedestrian walkways in the form of raised walkway, hard shoulder, soft shoulder, or covered drains depending on available right of way and local needs.	<ul style="list-style-type: none"> • Designed by the DPR Consultant • Implemented by the civil works contractor • Monitored by PIU/IEC
2	Ensure and monitor the participation of at least 40% of women and girls in community awareness activities (road safety, human trafficking, and HIV/AIDS awareness prevention) and consultations.	<ul style="list-style-type: none"> • Implemented by the resettlement and community awareness NGO • Monitored by PIU/IEC and reported in the semi-annual social monitoring report
3	Monitor women's participation in construction and maintenance activities.	<ul style="list-style-type: none"> • Implemented by the civil works contractor • Monitored by PIU/IEC (Sex-disaggregated data to be collected for the number of maintenance workers employed)

ADB = Asian Development Bank, DPR = detailed project report, IEC = independent engineering consultant, PIU = Project Implementation Unit of Karnataka State Highways Improvement Project; NGO = non-government organization
Source: Asian Development Bank.

57. **HIV/AIDS and human trafficking.** The PIU shall ensure that community awareness campaigns about HIV/AIDS and human trafficking prevention will be carried out along the project road corridors by the resettlement and community awareness NGOs/agencies in coordination with existing local programs. Moreover, the PIU shall ensure that the works contracts under the project incorporate provisions to the effect that the contractors are required to (i) carry out HIV/AIDS awareness programs for labor, and (ii) disseminate information at worksites on the risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction. Such contracts will also include clauses for termination in case of any breach of the stated provisions by the contractors. The social experts from the IEC will monitor the implementation.

58. **Labor standards.** The State Government of Karnataka and the PIU shall ensure that the works contracts under the project follow all applicable labor laws of the Government of India and the State of Karnataka and that these further include provisions to the effect that contractors will

(i) follow and implement all statutory provisions on labor (including not employing or using children as labor, equal pay for equal work), health, safety, welfare, sanitation, and working conditions. Such contracts will also include clauses for termination in case of any breach of the stated provisions by the contractors. The IEC will monitor the implementation.

59. **Road safety.** The PIU shall ensure that community awareness campaigns about road safety will be carried out by the resettlement and community awareness NGOs/agencies along the road corridors of the project. The social experts from the IEC will monitor the implementation.

IX. PERFORMANCE MONITORING, EVALUATION, REPORTING, AND COMMUNICATION

A. Project Design and Monitoring Framework

60. The design and monitoring framework (DMF) is in Attachment 2 of this PAM.

B. Monitoring

61. **Project performance monitoring.** The achievement of the project performance targets will be assessed following the DMF. The PIU will, within 3 months of the loan signing, develop a systematic project performance monitoring system, in form and substance, which is acceptable to ADB for use throughout the life of the project. The PIU will also establish, within 3 months of loan effectiveness, a baseline for performance indicators to be used for monitoring the implementation of each road subproject. The PIU will conduct annual evaluation surveys for each road subproject, in accordance with the project performance monitoring system, to evaluate the scope, implementation arrangements, progress, and achievement of the project objectives.

62. **Compliance monitoring.** Compliance with covenants will be monitored through ADB's project administration missions—including the project inception mission—to discuss and confirm the timetable for compliance with the loan covenants; project review missions to review the borrower's compliance with particular loan covenants and, where there is any noncompliance or delay, to discuss proposed remedial measures with the government; and the midterm review mission, if necessary, to review covenants to assess whether they are still relevant or need to be changed, or waived due to changing circumstances.

63. **Safeguards monitoring.** Implementation of the EMP, RP, IPP, and social mitigation measures will be monitored internally by the designated PIU officers and externally by the external monitor and ADB safeguards staff.

64. **Environment safeguard monitoring.** Records on implementation of the mitigation measures on site will be maintained by the contractor on a monthly basis. Based on these records and at least monthly spot checks by the IEC, monitoring reports will be compiled on a quarterly basis and submitted to the KSHIP-EMPIU. These quarterly monitoring reports will further be compiled into annual environmental monitoring reports for all project roads for further submission to ADB for disclosure on the ADB website. If there are any changes in the design or alignment, or if there are any unanticipated impacts, the EMP of the respective road will be updated to account for any additional or new environmental impacts and relevant corrective actions. The need for revising the respective IEE report will also be reviewed and confirmed in discussion with ADB.

65. **Social safeguard monitoring.** The SDRC of the PIU will be responsible for overall

internal monitoring and evaluation of the project progress for social safeguards. Social safeguards will also be monitored by a social development specialist from ADB's South Asia Department.

66. **Internal monitoring.** An internal monitoring system will be established by the SDRC and the RP implementing agency/NGO with the support of the independent engineering consultant's resettlement experts. A set of process, outcome, and baseline indicators will be developed and the baseline gathered at the onset of RP implementation. These indicators will include assessing whether resettlement goals have been achieved, whether livelihood and living standards have been restored, and provide recommendations for improvement. Monitoring will also ensure the recording of affected persons' views on resettlement issues, such as the displaced peoples' understanding of entitlement policies, options, and alternatives; site conditions; compensation valuation and disbursement; grievance redress procedures; and staff competencies. Moreover, the RP implementing agency/NGO will develop a system to manage land acquisition and resettlement data (records of compensation and disbursements) as well as to maintain records of consultations, grievances, and redress.

67. **External monitoring.** The PIU will recruit external monitoring consultants to monitor the implementation of the resettlement plans and community awareness activities. Key activities will include (i) reviewing and assessing the implementation of the resettlement plans; (ii) monitoring the implementation schedule against the targets achieved; (iii) monitoring the implementation of HIV/AIDS and human trafficking prevention community awareness activities; and (iv) monitoring compliance of the civil works with core labor standards.

68. **Independent monitoring.** ADB will recruit a third-party monitor to assess the fairness and transparency of the direct purchase process. The independent monitor will report directly to ADB.

69. **Gender monitoring.** The IECs will undertake monitoring of the number of women employed for maintenance. Sex-disaggregated data should be collected and reported in the semi-annual social monitoring report (see Table 14).

70. **Monitoring reports.** Regular monitoring reports will be prepared for the KSHIP and ADB. Table 14 provides more details on the required reports to be produced.

Table 14: Social Direct Purchase Reporting Requirements²¹

Type of Report	Content	Frequency	Responsibility
RP update	Provide the updated list of affected persons and assets after the joint verification survey.	Once	NGO/KSHIP/IEC to submit to ADB
Addendum(s)	Detail the land acquisition and resettlement impacts, socioeconomic survey of affected persons, mitigation and rehabilitation measures, budgetary requirements, and timeline for implementation.	To be prepared when either condition below is met: (i) for sections of the project where the design is not final (ii) for unforeseen activities with resettlement impacts	NGO/KSHIP/IEC to submit to ADB

²¹ The table lists all the reports related to the implementation of resettlement activities—even internal reports already included in the terms of reference of the resettlement plan (RP) implementing NGO/agency or external monitor. The list is not exclusive to the safeguards reports required to be disclosed as per the Safeguard Policy Statement.

Type of Report	Content	Frequency	Responsibility
Monthly progress report	Progress on land acquisition and resettlement activities, progress on indicators, results, issues affecting performance, constraints, variation from RP (if any) and reason for the same, and corrections recommended	Monthly	RP implementing agency/NGO to submit to PIU
Semi-annual social monitoring report	Progress on land acquisition and resettlement activities, indicators, variations (if any) with explanation and outcome, recommended corrective actions Progress on the implementation of community awareness activities on HIV/AIDS, human trafficking, and road safety, and reporting on gender	Semi-annually	PIU/IEC to submit to ADB
External monitoring report	Progress on land acquisition and resettlement activities, indicators, variations (if any) with explanation and outcome, affected person's satisfaction with process, compliance with ADB's SPS, corrective actions recommended. Progress on the implementation of community awareness activities on HIV/AIDS, human trafficking, and road safety	Semi-annually	External monitor to submit to PIU
Independent monitoring report – direct purchase	Assess the fairness and transparency of the direct purchase process and concerned owners' satisfaction with process.	Semi-annually	Independent monitoring team ADB to submit to ADB/PIU
Resettlement completion report	Overall narrative of the land acquisition and resettlement process, outputs and outcomes of indicators from baseline, key variations/ changes, lessons learned	Once	KSHIP/IEC to submit to ADB

ADB = Asian Development Bank, IEC = International Engineering Consultant, KSHIP = Karnataka State Highways Improvement Project, NGO = nongovernment organization, PIU = Project Implementation Unit of Karnataka State Highways Improvement Project, RP = resettlement plan, SPS = Safeguard Policy Statement.
Source: Asian Development Bank.

C. Evaluation

71. The project inception mission will be fielded soon after the legal agreements for the project are declared effective; thereafter, regular reviews will follow at least annually. As necessary, special loan administration missions and a midterm review mission will be fielded, under which any changes in scope or implementation arrangement may be required to ensure achievement of project objectives. The PIU will monitor project implementation in accordance with the schedule and time-bound milestones, and keep ADB informed of any significant deviations that may result in the milestones not being met. A project completion report will be submitted by the PIU within 3 months of physical completion of the project, providing detailed evaluation of the progress of implementation, costs, consultant performance, social and economic impact, and other details as requested by ADB.²²

²² Project completion report format is available at <http://www.adb.org/sites/default/files/pai-6-07-a.pdf>

D. Reporting

72. The PIU will provide ADB with (i) quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) semi-annual social monitoring reports; (iii) consolidated annual reports including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions, (c) updated procurement plan, and (d) updated implementation plan for the next 12 months; and (iii) a project completion report within 6 months of physical completion of the project. To ensure projects continue to be both viable and sustainable, project financial statements and the executing agency's audited financial statements, together with the associated auditor's report, should be adequately reviewed.

E. Stakeholder Communication Strategy

73. The project will follow ADB's standard consultation and disclosure requirements and provide relevant information, including information from the above documents, in a timely manner, in an accessible place, and in a form and languages understandable to all affected people and other stakeholders. If the affected people are illiterate, other appropriate communication methods must be used, such as direct verbal communications through one-on-one or other meetings, and grievance redress meetings. In addition, with the support of the resettlement implementing NGOs, the PIU will distribute leaflets outlining key project impacts and entitlements to affected persons, post the contact information about the grievance redress committee, conduct information sessions at the outset of project implementation, and follow up with consultation meetings to update road residents of civil work progress throughout the life of the project. The KSHIP already has a website in both Kannada and English outlining the features of the project (www.kship.in).

74. Salient information regarding the project, including scope, general progress status, beneficiaries, invitation for bid, and consultant recruitment notices, will be provided to the public. The information will be made available and updated through the official website of the PIU. The safeguard documents, i.e., initial environmental examination reports, including the EMP and the resettlement plans, will be posted on the ADB website.

X. ANTICORRUPTION POLICY

75. The Government of India, the State Government of Karnataka, the KPWD, and the PIU are advised of ADB's Anticorruption Policy (1998, as amended to date). Consistent with its commitment to good governance, accountability, and transparency, the implementation of the project shall adhere to ADB's Anticorruption Policy. ADB reserves the right to review and examine, directly or through its agents, any alleged corrupt, fraudulent, collusive, or coercive practices relating to the project. In this regard, investigation of government officials, if any, would be requested by ADB to be undertaken by the government.

76. To support these efforts, relevant provisions of ADB's Anticorruption Policy are included in the loan regulations, agreements, and the bidding documents. All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the State of Karnataka, the KPWD, and the PIU, and all contractors, suppliers, consultants, and other service providers as they relate to the project. Individuals/entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activity and may not be

awarded any contract under the project.²³

77. Karnataka has been among the first states in the country to enact specific legislation for anticorruption measures through the Karnataka Lokayukta Act (Act 4 of 1985), which appoints an anticorruption ombudsman with specific powers. Karnataka has also legislated the Karnataka Transparency in Public Procurements Act (Act 29 of 2000) that governs all public procurement and ensures transparency. The PIU will follow norms and standards prescribed in the legislations and executive orders issued by the state government from time to time, which emphasize integrity and transparency in managing of works. To achieve this goal, the e-tendering system has been introduced in 2009. Other initiatives such as the computerization of accounts and the web-based work progress monitoring system have been developed to enhance transparency.

78. ADB's Anticorruption Policy designates the Office of Anticorruption and Integrity²⁴ as the point of contact to report allegations of fraud or corruption among ADB-financed projects or its staff. The Office of Anticorruption and Integrity is responsible for all matters related to allegations of fraud and corruption. For a more detailed explanation, refer to the Anticorruption Policy and Procedures. Anyone coming across evidence of corruption associated with the project may contact the Office of Anticorruption and Integrity by telephone, facsimile, mail, or email at the following numbers/addresses:

- by email at integrity@adb.org or anticorruption@adb.org
- by phone at +63 2 632 5004
- by fax to +63 2 636 2152
- by mail at the following address (**Please mark correspondence Strictly Confidential**):
Office of Anticorruption and Integrity
Asian Development Bank
6 ADB Avenue
Mandaluyong City 1550
Metro Manila, Philippines

79. The website of the PIU will provide updated, detailed information on project implementation. For example, it will include procurement-related information such as ongoing tenders, list of participating bidders, name of the winning bidder, basic details on bidding procedures adopted, amount of contract awarded, and the list of goods and/or services procured.

XI. ACCOUNTABILITY MECHANISM

80. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make a good faith effort to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.²⁵

²³ ADB's Integrity Office website is available at <http://www.adb.org/integrity/unit.asp>

²⁴ ADB's Integrity Office website is available at <http://www.adb.org/integrity/unit.asp>

²⁵ For further information, see <http://www.adb.org/Accountability-Mechanism/default.asp>

XII. RECORD OF CHANGES TO THE PROJECT ADMINISTRATION MANUAL

Sl. No.	Date	Description of Revisions

PROCUREMENT PLAN

Basic Data

Project Name: Karnataka State Highways Improvement III Project	Executing Agency: Government of Karnataka, acting through Public Works, Ports, and Inland Water Transport Department
Country: India	Loan Number:
Loan Amount: \$346,000,000	Date of First Procurement Plan: 30 June 2016
	Date of this Procurement Plan: 23 October 2017

A. Process Thresholds, Review, and 18-Month Procurement Plan

1. Project Procurement Thresholds

1. Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works

Method	Threshold
International Competitive Bidding for Works	Equal to or above \$40 million
International Competitive Bidding for Goods	Equal to or above \$1 million
National Competitive Bidding for Works	Below \$40 million
National Competitive Bidding for Goods	Below \$1 million
Shopping for Goods	Below \$100,000

2. ADB Prior or Post Review

2. Except as ADB may otherwise agree, the following prior or post review requirements apply to the various procurement and consultant recruitment methods used for the project.

Procurement Method	Prior or Post	Comments
Procurement of Works and Goods		
International Competitive Bidding for Works	Prior	
International Competitive Bidding for Goods	Prior	
National Competitive Bidding for Works	Prior	
National Competitive Bidding for Goods	Prior	
Shopping for Goods	Post	
Recruitment of Consulting Firms		
Quality- and Cost-Based Selection (QCBS)	Prior	

3. Goods and Works Contracts Estimated to Cost More Than \$1 Million

3. The following table lists goods and works contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

General Description	Contract Value	Procurement Method	Prequalification of Bidders (Y/N)	Advertisement Date (Quarter/Year)	Comments
Road construction, including culverts, bridges, and associated works	\$100–\$150 million	ICB	N	Q2/2017	3 contract packages
Road safety measures	\$12 million	NCB	N	Q3/2018	1 contract package

ICB = international competitive bidding, N = no, NCB = national competitive bidding, Q = quarter, Y = yes.

4. Consulting Services Contracts Estimated to Cost More Than \$100,000

4. The following table lists consulting services contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

General Description	Contract Value	Recruitment Method	National or International Assignment	Advertisement Date (Quarter/Year)	Comments
Independent Engineering Consultant	\$3.00 million	QCBS (80:20)	International	Q3/2016	Package 1
Independent Engineering Consultant	\$3.00 million	QCBS (80:20)	International	Q3/2016	Package 2
Independent Engineering Consultant	\$3.00 million	QCBS (80:20)	International	Q3/2016	Package 3
Implementation Support	\$2.00 million	QCBS (80:20)	National	Q1/2018	
Road safety audit and design	\$2.50 million	QCBS (80:20)	International	Q3/ 2018	

Q = quarter, QCBS = quality- and cost-based selection.

B. Indicative List of Packages Required under the Project

5. The following table provides an indicative list of all procurement (goods, works, and consulting services) over the life of the project. Contracts financed by the borrower and others are also indicated, with an appropriate notation in the comments section.

General Description	Estimated Value (Cumulative)	Estimated Number of Contracts	Procurement Method	Domestic Preference Applicable	Comments
Works	\$400 million	3	ICB	No	
Works	\$12 million	1	NCB	No	
Consulting Services	\$18 million	11	QCBS (80:20)	Full Technical Proposal	

ICB = international competitive bidding, NCB = national competitive bidding, QCBS = quality- and cost-based selection.

DESIGN AND MONITORING FRAMEWORK

Impact the Project is aligned with: Mobility and access to economic opportunities, improved (Three-Year Action Agenda) ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome Road transport efficiency and safety in Karnataka improved	By 2024 a. Movement of people and goods on rehabilitated roads, as measured by annual average daily traffic, increased by 40% (2015 baseline: 3,967 PCU/day) b. Average travel time on the project roads reduced by 20% (2015 baseline: 1.8 minutes/km) c. Vehicle operating cost (economic) on the project roads reduced by 25% (2015 baseline: ₹7.70 per km for cars and ₹20.60 per km for medium trucks) d. Fatalities on the project roads reduced by 10% (2015 baseline: 0.05 fatalities/PCU/day).	a–d. Completion report, submitted by independent engineering consultant and approved by KPWD	Transport demand is impacted by severe economic reversals in Karnataka.
Outputs 1. State highways upgraded	By 2023: 1a. At least 418 km of state highways upgraded to 2 lanes with paved shoulders or 4 lanes under hybrid-annuity contracts (2017 baseline: 0) 1b. Road safety features benefitting the elderly, women, children and the - disabled installed in at least 22 locations ^b . (2017 baseline: 0)	1a.–b. Quarterly progress reports by the project implementation unit	Major turnover in key project staff during implementation

^a Government of India. Niti Aayog. 2017. *Three Year Action Agenda (2017–18 to 2019–20)*. New Delhi.

^b Features include covered drains, footpaths, marked pedestrian crossings and walkways, safety warning signs, bus shelters, and safety signage.

2. Road safety measures on state highways installed	<p>By 2023:</p> <p>2a. Road safety audit completed on state highways in the core road network. (2017 baseline: Not completed)</p> <p>2b. Accident mitigation measures implemented for at least 12 identified accident spots. (2017 baseline: 0)</p>	2a–b. Quarterly progress reports by the project implementation unit	
3. Institutional capacity and efficiency of KPWD improved	<p>By 2023:</p> <p>3a. Certification documentation and audit for ISO 9001:2015 completed in at least 150 sub-divisional offices of KPWD (2017 baseline: 0)</p> <p>3b. Certification and documentation and audit for ISO 14001:2015 completed in at least 40 divisional offices in KPWD (2017 baseline: 0)</p> <p>By 2019:</p> <p>3c. Public response system and complaint-handling mechanism established (2017 baseline: Not established)</p>	3a.–c. Completion certificate by KPWD	

Key Activities with Milestones

1. State highways upgraded

- 1.1 Select, engage and mobilize independent engineering consultants by Q1 2018.
- 1.2 Award contracts for upgrading about 418 km of state highways by Q2 2018 and complete construction by Q4 2023.
- 1.3 Conduct post-implementation measurement of indicators by KPWD by Q4 2024.

2. Road safety measures on state highways installed

- 2.1 Recruit consultants for conducting road safety audit by Q4 2018.
- 2.2 Complete road safety audit and identification of improvement measures by Q1 2020.
- 2.3 Complete implementation of identified road safety measures by Q4 2023.

3. Institutional capacity and efficiency of KPWD improved

- 3.1 Mobilize consultants for public response system by Q4 2018.
- 3.2 Commence design of public response system and complaint handling mechanism by Q1 2019.
- 3.3 Establish public response system and complaint handling mechanism by Q4 2019.
- 3.4 Mobilize consultants for systems assessment and certification by Q1 2021.
- 3.5 Commence certification audit and documentation by Q2 2022.

3.6 Complete implementation of ISO 9001:2015 and ISO 14001:2015 completed in identified divisional and sub-divisional offices of KPWD by Q1 2023.

Project Management Activities

Establish project implementation units by Q1 2018.

Make available counterpart funds by Q1 2018.

Complete resettlement plan activities by Q3 2019.

Inputs

Asian Development Bank: \$346 million (loan)

Government of Karnataka: \$202 million

Private sector: \$107 million

Assumptions for Partner Financing

Not applicable

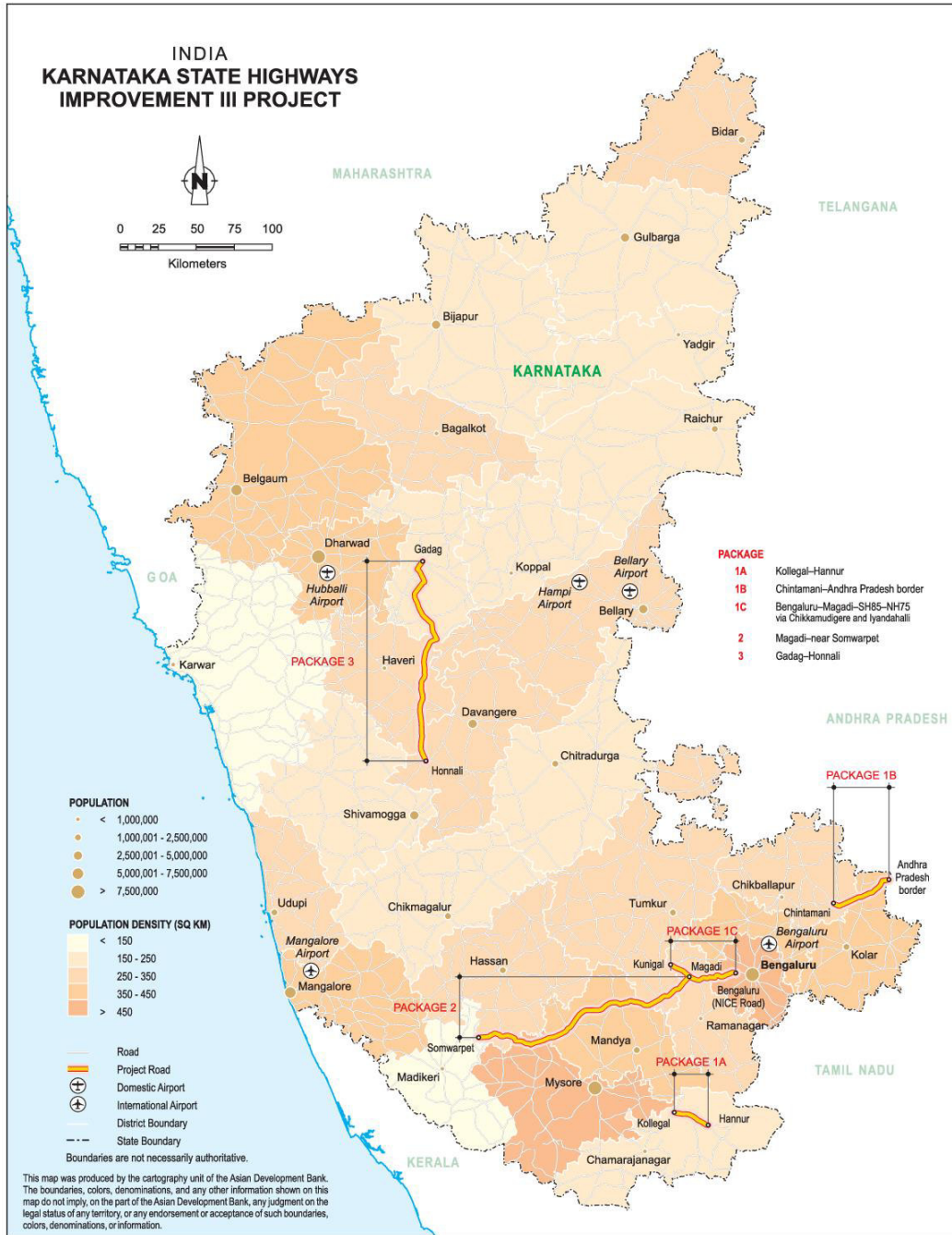
ISO = International Organization for Standardization; km = kilometer; KPWD = Karnataka Public Works, Ports, and Inland Water Transport Department; PCU = passenger car unit; Q = quarter;
Source: Asian Development Bank.

LIST OF PROJECT ROADS

Package Number	Name of Road	SH No.	District	Length (km)
1a	Kollegal – Hannur	SH79	Chamarajanagar	23.80
1b	Chintamani – Andhra Pradesh Border	SH82	Chikkabalapura, Kolar	39.80
1c	Bengaluru (NICE Road) – Magadi – Kunigal	SH85 and MDR	Bengaluru Urban, Ramanagara	50.70
2	Magadi – (Near) Somwarpet	SH85	Ramanagara, Tumkur, Mandya, Mysore, Hasan	166.05
3	Gadag – Honnali	SH57 and SH26	Gadag, Haveri, Davengere	138.20
Total				418.60

km = kilometer, MDR = major district road, SH = state highway.
Source: Asian Development Bank.

MAP of Project Roads



DESIGN STANDARDS

The design standards and general design considerations for all subprojects include the following:

Applicable Design Standards

- (1) Two lanes with paved shoulders – IRC: SP: 73 (2015)
- (2) Four lanes divided carriageway – IRC: SP: 84 (2014)

A. Road Geometry

Sl. No.	Design Specification	Unit	Proposed Design Standards		
1	Design Speed	km/hr	Plain / Rolling		
	Plain/Rolling (Open Country)		100 / 80		
	Plain/Rolling (Built-up Area)		60 / 50		
	Mountainous/Steep (Open Country)		60 / 40		
	Mountainous/Steep (Built-up Area)		40 / 30		
2	Lane Width	m	3.5		
3	Raised Median (for 4-lane, inclusive of shyness)	m	2.5		
4	Footpath (in Built-up area)	m	2 to 2.5		
5	Shoulder Width (Terrain: plain/rolling)	m	Type	Paved	Unpaved
			Rural	1.5	1.0 / 2.0
			Built-up	2.0	–
6	Camber	%	Flexible		
			Carriageway/Paved Shoulders		
			Earthen Shoulders		
7	Gradients	%	Ruling	Limiting	
			(a) Plain and Rolling	2.5	3.3
			(b) Mountainous	5.0	6.0
8	Minimum Horizontal Curve Radius	m	Plain & Rolling	Mountainous & Steep	
			Desirable Minimum	400	150
			Absolute Minimum	250	75
9	Sight Distance		100 km/hr	80 km/hr	
			Stopping Sight Distance	180	120
			Intermediate Sight Distance	360	240
			Overtaking Sight Distance	640	470

h = hour, km = kilometer, m = meter.

Source: Government of Karnataka.

B. Pavement Design: Flexible Pavement

- Applicable code: IRC – 37 – 2012
- Design life: 20 years
- Minimum traffic loading: 20 MSA

C. Bridges / Structures:

- Applicable codes: IRC: 5: (2015), IRC: 112 (2011), IRC: 6 (2014), IRC: SP: 13 (2004) and other applicable IRC, manuals
- Design flood frequency: 100 years

D. Others:

- Locations of signs shall conform to IRC:67-2012 and Section 800 of MORTH specifications
- Roadside drainage shall be in accordance with IRC: SP:42-2014 and IRC: SP:50-2013

Terms of Reference for Independent Engineering Consultant

A. Background

1. The Government of Karnataka has applied for a loan from the ordinary capital resource of the Asian Development Bank towards the cost of Karnataka State Highway Improvement Project - III (KSHIP-III) with the primary objective of improvement of state highways under hybrid annuity contracts.
2. Under KSHIP-III Performance Based Deferred Payment Scheme (PBDPS) project “(a) Two Laning with Paved Shoulder of Kollegal to Hannur (kilometer 0.000 to km 4.900 along Kollegal and Madhuvanhalli Bypass, from km 66.888 to km 85.770 of SH-79, length 23.8 kms); (b) Two Laning with Paved Shoulder of Chintamani to AP Border (km 47.203 to km 86.977 of SH-82, length 39.8 kms); and (c) Four Laning of Bengaluru (NICE Road) to Magadi and further to NH 48 via Chikkamudigere and lyandahalli (km 15.325 to km 50.850 of SH-85, km 50.850 to km 66.150 of MDR, length 50.8 kms) 114.4 km in the State of Karnataka, India on PBDPS basis, 114.4 kms of state highway have been proposed to be taken up for improvement under the PBDPS-based contracts (as detailed below) and is expected to commence by March 2017.

Table 1: Performance Based Deferred Payment Scheme

	Details	Length (km)	Contract Period	Estimated Project Cost (Rs Crore)	Estimated Duration of IEC Services*
1	Two laning with paved shoulder of Kollegal to Hannur (km 0.000 to km 4.900 along Kollegal and Madhuvanhalli Bypass, from km 66.888 to km 85.770 of SH-79)	23.8			
2	Two laning with paved shoulder of Chintamani to AP Border (km 47.203 to km 86.977 of SH-82)	39.8			
3	Four laning of Bengaluru (NICE Road) to Magadi and further to NH 48 via Chikkamudigere and lyandahalli (km 15.325 to km 50.850 of SH-85, km 50.850 to km 66.150 of MDR)	50.8			
	Total	114.4	10 years	895	10 years

AP = Andhra Pradesh, IEC = independent engineering consultant, km = kilometer, MDR = major district road, NH = national highway, SH = state highway.

* 6 months development period + 24 months construction period + 7 years operations and maintenance period.

Source: Asian Development Bank.

3. The Independent Engineer will be appointed for a period of around 10 years under the provisions of this contract.

B. Objectives of the Assignment

4. The consultancy assignment has two objectives:
 - (i) To ensure high quality designs and construction of all works for project management; timely implementation; compliance with the safeguard requirements of the contract and ADB's Safeguard Policy Statement (2009); and generally meet all contract requirements as per good engineering practice, CA, which conform with applicable standards and technical specifications; and
 - (ii) To train and build capacity in the project staff and designated contractor's staff.

C. Scope of Services, Tasks, Components, and Expected Deliverables

1. Scope and standards of performance

5. The terms of reference (TOR) for the independent engineer (IE) relate to the hybrid annuity contract agreement (CA) of the KSHIP-III projects. The CA will be awarded competitively by the Project Implementation Unit of Karnataka State Highway Improvement Project, hereinafter referred to as PIU-KSHIP or the Authority, to the lowest evaluated bidder (subsequently referred to as "Contractor"), in accordance with the Asian Development Bank Procurement Guidelines (April 2015) as amended from time to time. The term the Authority which expression shall, unless repugnant to the context or meaning thereof, include its administrators, successors and assigns. The term Contractor refers collectively to any subcontractors, suppliers, designers, consultants, etc. employed by the Contractor in fulfillment of its obligations provided under the CA. The IE will be selected competitively in accordance with the Guidelines for Recruitment of Consultants (2013) as amended from time to time.
6. In taking actions and making decisions, the IE shall be guided by professional values of project management, encompassing responsibility, respect, fairness, and honesty. The IE shall exercise its responsibility by taking ownership for decisions made, actions taken, and the consequences that may result. The IE's decisions and actions shall be based on the best interests of the parties to the CA, as well as public safety and social and environmental safeguards. If necessary, the IE shall be ready to take ownership for errors and omissions, promptly communicate them to the affected parties, and make corrections. The IE shall be fully familiar with and uphold the agreed policies, rules, and the respective rights and obligations of the Authority and the Contractor under the CA. The IE shall demonstrate respect by listening to and understanding the views of others, negotiating in good faith, and not acting in an abusive and arbitrary manner. It shall always remain the duty of the IE to apply fairness through conduct which is conducive to consistent impartiality and objectivity. Transparency, truthfulness, and avoidance and/or disclosure of real or potential conflicts of interest shall complement the IE's reputation for honesty.

2. General duties and functions

7. The IE shall be responsible for the review of designs prepared by the hybrid annuity contractor, including drawings and specifications, superintendence of the hybrid annuity contractor's performance under the CA, progress monitoring, technical and quality control, evaluations of construction, certification and completion of the works by the hybrid annuity contractor, and duties related to taking over and the defects liability period. The IE shall be present at all times during the day-to-day implementation of the design and construction periods and as required for the fulfillment of its assignment during the operation and maintenance period. Having been appointed by the Authority, in terms of the hybrid annuity contract, and delegated specific authorities in the CA, the IE shall be fully responsible for superintendence of the hybrid annuity contractor's performance in all phases of the CA. The IE shall at all times be adequately staffed, in terms of numbers and professional skills, to carry out its responsibilities with the competence and diligence required for this assignment.
8. The IE may organize his/her staff and activities as it wants, provided that it satisfies the requirements of these TOR and the contract between the Authority and the hybrid annuity contractor. A list of essential "Key Personnel" is given in subsequent sections of these terms of reference. In addition, an indicative list of Non-Key (support) Staff is also given for guidance. The IE should provide for adequate Non-Key (support) Staff, including administrative, accounts, and service staff, to address the requirements of a project of this nature in an efficient and effective manner.
9. The IE shall exercise the authority delegated to it by the Authority, within the parameters

established in the CA. The following is a summary of the delegated authorities, roles, and functions of the IE:

- (i) Review of the drawings (working and as-built), specifications and related documents, including detailed engineering and design documents, design and construction progress reports prepared by the hybrid annuity contractor;
- (ii) Review, inspection, and superintendence of the construction works including environmental management plan, resettlement action and social safeguard plans, traffic management program, work zone safety plan, and other special management programs as set forth in the CA; work with the hybrid annuity contractor to ensure timely and on budget execution of the road works;
- (iii) Ensure the hybrid annuity contractor's fulfillment of his/her quality assurance plan by visual observation, random measurements, and laboratory tests. Conduct tests and inspections on completion of construction and issue Completion/Provisional Completion Certificate as set forth in the CA;
- (iv) Coordination with stakeholders, including performing related duties and functions as necessary for the hybrid annuity contractor's successful and timely completion of the highway project under the CA;
- (v) Certification of payments;
- (vi) Review, inspection, and superintendence of operation and maintenance (O&M) as set forth in the CA;
- (vii) Contract administration;
- (viii) Review, inspection, and monitoring of divestment requirements as set forth in the CA;
- (ix) Assisting the parties to the CA in resolving disputes, differences, or controversies in accordance with the applicable provisions of the CA and dispute resolution clause of the CA;
- (x) Determining the costs of any works or services and/or their reasonableness, as required under the CA;
- (xi) Determining the period or any extension thereof, for performing any duty or obligation as required under the CA;
- (xii) Reporting progress of the works on a monthly basis;
- (xiii) Cooperating with the Third Party Quality Monitoring Team appointed by the Authority to carry out its tasks; and
- (xiv) Undertaking all other duties and functions in accordance with the CA.

10. Delegation of IE duties. The IE may, from time to time, assign duties and further delegate authority to key personnel and may also revoke such assignments and delegations. These assignments, delegations, and revocations shall not take effect until they have been duly notified to the Authority and the hybrid annuity contractor. Each key expert shall only be authorized to issue instructions to the hybrid annuity contractor to the extent defined in the notice of delegation. Any approval, instruction, notice, request or similar act by key personnel, in accordance with this delegation, shall have the same effect as though the act had been an act of the IE. The IE will appoint the Senior Highway Engineer to act as Team Leader (TL) as mentioned in the contract documents, and who will reside full-time at the project site. The TL will interact with the designated representative of the Authority. The TL shall delegate some of his/her authority to other key experts, who will act as "the IE's Representative" in the construction site supervision teams. Each supervision team will be composed of several professionals. The IE shall define in its technical proposal the number of supervision teams and the overall supervision approach for the project. The proposals shall describe how the IE will establish a mechanism, which will ensure coordination of the supervision teams, so that each team is at all times fully aware of the remedies to problems used by the other teams. This will ensure that the full experience of the IE can be applied in all works.

11. The IE shall arrange training for the Authority's staff (about 20 persons) including field visits to the ongoing works under the IE's supervision to improve their ability to supervise and manage the road and bridge works and the environmental impacts of construction. The training module shall be finalized in consultation with the client.
12. **Training structure.** The training program shall comprise both classroom and on-the-job training. The proposal shall contain a detailed training program that is considered to be beneficial for developing capacity within the KSHIP staff (and some designated Contractor's staff). An outline of the training is provided below. However, the outline of the training is only a minimum requirement. The IE can further develop on the outline to develop a robust program. The cost and expenses in relation to the training arrangements, including venue arrangement, lunch/dinner, projector/sound/AV systems, and stay for trainees, shall be borne by the IE. For classroom training purposes, the location of the training shall be Bangalore. For classroom trainings, the trainees through their offices will meet the expenditures of travel, transportation, and boarding charges. The IE will meet the expenditures of training venue, resource persons, training materials, etc., required for conducting the training. In case of all the job trainings, the cost of transportation for the trainees from base location to training location will be borne by the trainees themselves and the IE will meet boarding, lodging and food, local transportation to the site, etc.
13. Kindly note that the timelines for trainings shall be finalized in agreement with KSHIP, however the IE shall ensure that the first round of trainings is scheduled immediately post Financial Closure and the next refresher session shall be held with 3 months of commencement date.

Part 1: Classroom Training

Details of Training				
Sl. No.	Module Details	Objective	Target Skill Set to be Developed	Time Duration
1	Operational Assessment and Contract Management <ul style="list-style-type: none"> • Introduction • Objectives • Introduction to conditions of contract • Role of hybrid annuity contractor, Independent Engineer and Employer • Contract management in PPPs • Introduction to performance indicators • Analyzing performance against KPIs • Contract management • Value testing methods • Review • Tutorial 	<p>The objective of the module is to provide the concerned personnel with the knowledge of contract management and roles to be played by each party. The focus should be on what are the detailed roles; specific tool/formats used in monitoring of contract (KPI monitoring during both construction and O&M period); escalation triggers in case of non-performance; issues in contract management, etc. Also, international best practices like value testing in the operation period shall also be introduced.</p>	<p>The training will enable personnel to appreciate the role of contract management in PPPs, and have an understanding of the "how" part of contract management.</p>	<p>2 trainings of 1 day each (may be organized at a time in agreement with the PIU-KSHIP)</p>
2	PEM Module 3 – Project	The objective of the	The training shall	1 day (may

Details of Training				
Sl. No.	Module Details	Objective	Target Skill Set to be Developed	Time Duration
	Management <ul style="list-style-type: none"> • Introduction • Objectives • Principles of project management • Principles of good governance in PPPs • Introduction to project management tools • Demonstration of Microsoft Project, Primavera • Stakeholder management • Conclusion • Review • Tutorial 	module will be to provide overview of project management and governance in PPPs. The module shall also introduce relationship and trust based approaches in governance.	enable the personnel to appreciate the role of project management and governance in successful delivery of a PPP project.	be organized at a time in agreement with the PIU-KSHIP)

KPI = key performance indicators, O&M = operation and maintenance, PIU-KSHIP = Project Implementation Unit of Karnataka State Highways Improvement Project, PPP = public-private partnership.

14. **Part 2: On-the-job training.** KSHIP shall identify trainees to work alongside the IE for a period of 5 days. The IE shall develop an on-the-training program for the trainees in discussion with the PIU-KSHIP and synchronised with the classroom training modules. The IE shall review the trainees on their performance in the on-the-job training and shall provide KSHIP an understanding on what improvements are required for each trainee and in what direction.
15. **Authority to amend the CA.** The IE shall have no authority to amend, suspend, or terminate the CA with regard to the hybrid annuity contractor's rights and obligations, without written instructions from the Authority.
16. **Meetings with Authority.** The IE shall interact with the Authority's designated officers and staff on a regular basis and attend the Authority's monthly meeting to review the hybrid annuity contractor's progress during the preceding month. The IE shall make available its assistants and other key staff, as required, for these monthly meetings. The issues discussed between the IE and the Authority shall be recorded in the minutes of the meeting and remain on the agenda of subsequent meetings, until they are fully resolved.
17. The IE shall chair monthly meetings with the hybrid annuity contractor. During these meetings, formal minutes will be taken by the IE and distributed to the hybrid annuity contractor and the Authority.
18. **Meetings with ADB.** The IE shall be available to attend meetings with ADB missions during their visits to the Authority and on field trips.
19. **Management information systems.** The IE shall make use of management information systems (MIS) in carrying out its assignment and provide read-only remote access to its MIS records and reports to the Authority and the hybrid annuity contractor. Confidential records and reports shall be exempted from this requirement for remote access to the IE's MIS.
20. **Record of digitized inventory, drawings and specifications, and other documents.** Upon completion of its assignment, the IE shall obtain, sort, and prepare a digitized inventory of all drawings, specifications, other documents, test reports, certificates, and similar records related to the pursuit of the CA. The IE's digitized inventory shall be turned

over to the Authority for safekeeping.

21. The IE shall maintain the Deviation Report and send it monthly to the Authority and the hybrid annuity contractor in a format prescribed by the Authority.
22. The IE shall maintain digital color photographs throughout the duration of the Contract for photographic record (available for inspection) of monthly progress at set locations, especially of any construction of technical or contractual interest. Each photograph should be captioned with the reference number, time, date, precise location, subject, and points of particular note. All digital data with captions should be stored on a digital record system.
23. The IE shall keep a daily log of the progress and issues on the construction sites.
24. The IE shall update all records that it collects on the KSHIP project monitoring system (PMS).

3. Duties and Functions during the Development Period

25. **Review of designs, drawings, specifications, and construction methodology.** During the development period, the IE shall undertake a detailed review of the construction methodology, together with drawings, quality assurance procedures, procurement, engineering construction time schedule, and deviation in designs, drawings, and specification, if any, to be furnished by the hybrid annuity contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, mix designs, traffic operations and safety arrangements, traffic surveys, topographical/subsurface surveys, and review of supplemental environmental impact assessment and environmental management plan (EIA/EMP) for possible impact owing to design changes. This review shall verify that the safety measures specified in the CA are included in the detailed designs. The IE shall complete such review and send its comments/observations with particular reference to their conformity or otherwise with the scope of the project and the specifications and standards defined in the CA, to the Authority and the hybrid annuity contractor within 15 days of receipt of such drawings and specifications. In particular, such comments/observations shall specify the conformity or otherwise of such drawings and specifications with the CA.
26. After reconciling further comments received from the Authority and the hybrid annuity contractor with its own, the IE shall make a final determination of its findings and advise the hybrid annuity contractor accordingly. Subsequently, the IE shall review any modified drawings, specifications, or supporting documents sent to it by the hybrid annuity contractor and shall give its clearance or observations, if any, within 7 days of receiving such modified drawings, specifications, or documents.
27. **Construction safety and environmental management.** The IE shall review the hybrid annuity contractor's construction zone safety checklist and environment management plan (EMP) in accordance with the relevant requirements of the CA and furnish its comments thereon to the Authority and the hybrid annuity contractor within 7 days of receiving such checklist and EMP. The IE shall subsequently monitor the hybrid annuity contractor's compliance with the traffic management plan, construction zone safety checklist, environmental management plan, social safeguard plan, and, if necessary, enforce the relevant provisions of the CA in this regard. In particular, the IE will confirm that the hybrid annuity contractor's management plan complies with the conditions of the EIA clearance granted by the State Environment Impact Assessment Authority (SEIAA) or the National Environment Impact Assessment Authority (NEIAA), as the case may be. In case of divergence of the plan from the conditions of the said clearance, the IE shall bring the

same to the attention of the Authority and the hybrid annuity contractor.

28. **Review of the hybrid annuity contractor's quality assurance procedures.** The IE shall periodically review the hybrid annuity contractor's quality assurance procedures and furnish its comments to the Authority and the hybrid annuity contractor within 15 days of receipt thereof. The IE shall subsequently monitor the hybrid annuity contractor's compliance with the quality assurance procedures.
29. **Review of project agreements.** Upon reference by the Authority, the IE shall review and comment on the engineering, procurement, and construction (EPC) contract or any other contract for construction, operation, and maintenance of the project highway, proposals from the hybrid annuity contractor, or agreements entered by the hybrid annuity contractor with any contractors on such works, and furnish its comments within 7 days from receipt of such reference from the Authority.
30. The IE shall conduct joint measurements and review costing proposed by the hybrid annuity contractor, as and when required, as per the provisions of the hybrid annuity contract agreement, including but not limited to aspects like change of scope, utility shifting, etc.

4. Duties and Functions during the Construction Period

31. **Review of drawings and specifications.** In respect of the drawings, documents, and report on compliance with safety requirements received by the IE for its review and comments during the construction period, the provisions of Paragraph 3.1 shall apply, mutatis mutandis (with the necessary changes).
32. **Quality and safety assurance.** The duties and functions of the IE during the construction period shall be all-encompassing, including superintendence of the hybrid annuity contractor's performance of the works on a day-to-day basis, particularly with regard to the deployment of labor, materials, equipment and standards of materials and workmanship, and safety arrangements and environmental management in accordance with the EMP at the site. The IE shall have no authority to relieve the hybrid annuity contractor of any of their duties under the CA or to impose additional obligations. The IE shall ensure the Resettlement Action and Social Safeguard Plan is implemented as designed and update the mitigation measures if required.
33. **Quality testing.** The IE shall provide sufficient staff to carry out inspections and tests in the field to the extent of a minimum of 25% of the 100% hybrid annuity contractor's Requests for Inspection (RFI) pertaining to various items of works. The 25% of representative RFIs have to be selected in such a way by the IE that those RFIs will fairly represent the quality and quantity of work being carried out. The IE shall either issue written clearances or require the hybrid annuity contractor, within 7 days of such inspections, to rectify and remedy identified defects or deficiencies. Furthermore, with regard to pavement sub-base and bituminous courses, the IE shall field-check 100% of RFIs. The inspection procedures to be observed by the IE, the hybrid annuity contractor, and the Authority shall be governed by the corresponding CA requirements. The inspections, submission of such inspection reports, and clearance of the RFI by the IE shall not relieve or absolve the hybrid annuity contractor of its obligations and liability. The IE shall also have access to the hybrid annuity contractor's laboratory facilities for independent testing of materials. It may be noted that the IE shall have to additionally input and update the collected data on the KSHIP PMS.
34. **Inspection report.** At least once a month, the IE shall summarize such inspections in its Inspection Report and submit to the Authority and the hybrid annuity contractor, setting

forth an overview of the status, progress, quality, and safety of construction, including the work methodology adopted, the materials used and their sources, including development and rehabilitation and conformity of construction works with the scope of project and specification standards.

35. **Rectification of defects and deficiency.** In the event that the hybrid annuity contractor is required to carry out any remedial works for removal or rectification of any defects or deficiencies, the IE shall require the hybrid annuity contractor to prove through appropriate tests that such remedial works have brought the works into conformity with the CA. The IE shall take all necessary measures to achieve closure of non-conformances through the hybrid annuity contractor's actions in the shortest possible time, but in no case later than provisional completion. The IE shall maintain complete records of all remedial works from their identification to rectification.
36. **Review of achievement of milestones prescribed.** In the event that the hybrid annuity contractor fails to achieve any of the CA milestones, the IE shall undertake a review of the progress of construction and identify the causes of delays, if any. If the IE determines that the rate of progress of the works is not likely to achieve the CA milestones, including the construction completion date, it shall notify and require the hybrid annuity contractor to indicate within 15 days of its notice to the hybrid annuity contractor, the steps proposed to be taken to expedite progress, and the period within which the CA milestones, including the construction completion date, shall be achieved. This notice to the hybrid annuity contractor shall be copied to the Authority. Upon receipt of the hybrid annuity contractor's response, the IE shall review the steps proposed by the hybrid annuity contractor and send its final determination concerning the likely achievement of the CA milestones to the hybrid annuity contractor and the Authority.
37. **Review and monitoring of safety arrangement and suspension of works on safety reasons.** If at any time during the construction period, the IE determines that the hybrid annuity contractor has not made adequate arrangements for the safety of workers and users in the zone of construction or that any work is being carried out in a manner that threatens the safety of the workers and the users, it shall notify the hybrid annuity contractor forthwith, and may further recommend to the Authority that the whole or part of the works be suspended for ensuring safety thereof. The Authority's notice of suspension for reasons of safety shall be promptly communicated to the hybrid annuity contractor and the IE. The suspension may be lifted by the Authority only upon the IE's determination and follow-up inspection that the conditions which caused the suspension have been removed or remedied sufficiently. In emergency cases, the IE will take such actions and steps to ensure the safety pending clearance from the Authority.
38. **Review and monitoring of environmental arrangement and suspension of works on environmental reasons.** If at any time during the construction period, the IE determines that the environmental management measures are inadequate and can cause harm to the environment beyond permissible limits laid down in the EMP or the clearance issued for the project, it shall notify the hybrid annuity contractor forthwith and may recommend to the Authority that the whole or part of the work be suspended. The Authority's notice of suspension for reasons of higher than allowable risk to the environment shall be promptly communicated to the hybrid annuity contractor and the IE. The suspension may be lifted by the Authority only upon the IE's determination and follow-up inspection that the conditions which caused the suspension have been removed or remedied sufficiently. In emergency cases, the IE will take such actions and steps to ensure avoidance or at least minimization of damage to the environment, pending clearance from the Authority.
39. **Extension of time determination.** If the works are suspended by the Authority for reasons not attributable to the hybrid annuity contractor, the IE shall determine any

extension of dates set forth in the construction completion schedule and compensation, if any, to which the hybrid annuity contractor may be reasonably entitled. The IE shall notify the Authority of its determination and the Authority shall extend the construction completion schedule accordingly through notice to the hybrid annuity contractor. When the reasons for the suspension have subsided and the works can be resumed, the Authority shall lift the suspension through follow-up notice to the hybrid annuity contractor, in coordination with the IE.

40. **Tests to be carried out.** The IE shall require the hybrid annuity contractor to carry out, or cause to be carried out, all tests specified in the related schedules of the CA, from time to time, and in accordance with good industry practice for quality assurance. The hybrid annuity contractor shall carry out these tests in accordance with the instructions of the IE and furnish the test results to the IE. In the event that the results of any tests establish any defects or deficiencies in the works, the IE shall require the hybrid annuity contractor to carry out remedial measures and furnish a report to the IE in this regard. These IE's functions related to tests shall be carried out and communicated to the Authority and the hybrid annuity contractor in conformance with the related provisions of the CA.
41. **Certification of lump sum payments.** The hybrid annuity contractor shall submit requests for lump sum payments to the IE, in accordance with the applicable requirements of the CA, and the IE shall make fair and reasonable assessments of such payment requests and the associated documentation submitted by the hybrid annuity contractor. The IE shall verify and certify the amount claimed in the hybrid annuity contractor's invoice, along with the necessary adjustments, and recommend to the Authority for payment as provided in CA. The IE's recommendations with regard to the hybrid annuity contractor's payment requests shall reach the Authority within 14 days from the date of such claim by the hybrid annuity contractor after satisfactory fulfillment of conditions prescribed in the CA.
42. **Review of progress reports.** The IE shall review the monthly progress report furnished by the hybrid annuity contractor and provide its comments to the Authority and the hybrid annuity contractor within 7 days of receipt of such report. The IE shall provide its concurrence in the hybrid annuity contractor's monthly progress report or its reservations, as the case may be, to the hybrid annuity contractor and copy this communication to the Authority. If necessary, the IE shall require the hybrid annuity contractor to submit additional information related to the monthly progress report.
43. **Issue of completion and provisional completion certificate.** Upon completion of the works, as notified by the hybrid annuity contractor and the successful completion of all inspections and tests required by the CA, the IE shall issue to the hybrid annuity contractor and the Authority the Completion Certificate set forth in the CA. At the request of the hybrid annuity contractor, the IE may issue instead the Provisional Certificate also set forth in the CA. The Provisional Certificate may be used, when the project highway can be safely and reliably placed in commercial operation, even though certain parts of the works are not yet fully completed. In such event, the IE shall append to its Provisional Certificate, a list of outstanding items and their agreed completion dates. This list, which is referred to in the CA as Punch List, shall be signed jointly by the hybrid annuity contractor and the IE. In cases where certain parts of the works are not yet completed due to delays in completion attributable to the Authority, the IE shall not withhold the Provisional Certificate.
44. **Review of as-built drawings.** Within 90 days of the project completion date, the IE shall require the hybrid annuity contractor to furnish the as-built drawings in a manner acceptable to the Authority. The IE shall review the as-built drawings for each component of the works prepared by the hybrid annuity contractor and determine their acceptability under the terms of the CA. The IE shall communicate its determination to the Authority

and the hybrid annuity contractor. Additionally, within 90 days of each project milestones, the IE shall require the hybrid annuity contractor to furnish the as-built drawings in a manner acceptable to the Authority. The IE shall review the as-built drawings for each component of the works prepared by the hybrid annuity contractor and determine their acceptability under the terms of the CA. The IE shall communicate its determination to the Authority and the hybrid annuity contractor within 60 days of receipt of drawings.

45. **Maintenance Manual.** Not later than 180 days prior to the completion of works, the IE shall require the hybrid annuity contractor to submit a repair and maintenance manual (the "Maintenance Manual") for the regular and preventive maintenance of the project highway in conformity with the maintenance requirements, safety requirements, and good industry practice. The IE shall aid and advise the hybrid annuity contractor in preparing the Maintenance Manual.
46. **Determination of costs.** Upon reference from the Authority, the IE shall make a fair and reasonable assessment of the costs of providing information, works, and services as set forth in Article 16 and certify the reasonableness of such costs for payment by the Authority to the hybrid annuity contractor.

5. Duties and Functions during the Operation Period

47. **Review of drawings, documents, reports, etc.** In respect of drawings, documents, and report on compliance with safety requirements received by the IE for its review and comments during the operation period, the provisions in Paragraph 3 shall apply mutatis mutandis.
48. **Review of annual maintenance program.** The IE shall review the annual Maintenance Program furnished by the hybrid annuity contractor in conformance with the CA and convey its comments to the hybrid annuity contractor within 15 days of its receipt with particular reference to its conformity with the maintenance requirements, maintenance manual and safety requirements, as well as relevant provisions of the EMP for the operation phase, with copies to the Authority. In case of reservations with the initial annual Maintenance Program, the IE shall subsequently review the hybrid annuity contractor's follow-up response and communicate its final determination regarding the conformance of the annual Maintenance Program with the CA to the hybrid annuity contractor, copied to the Authority.
49. **Monthly progress report during O&M period.** The IE shall review the monthly progress report on operation and maintenance (O&M) furnished by the hybrid annuity contractor and provide its comments to the hybrid annuity contractor within 7 days of its receipt, copied to the Authority. In case of reservations with the initial monthly progress report on operations and maintenance, the IE shall subsequently review the hybrid annuity contractor's follow-up response and communicate its final determination regarding the conformance of the progress on operations and maintenance with the CA and the Maintenance Manual to the hybrid annuity contractor, copied to the Authority.
50. **Monitoring of maintenance works.** During the operation period, the IE shall inspect the project highway once every month, preferably following receipt of the hybrid annuity contractor's monthly progress report on operations and maintenance. The IE shall provide the Authority and the hybrid annuity contractor with its O&M Inspection Report within 7 days of its monthly inspection. The IE's O&M Inspection Report shall cover an overview of the status, timeliness, and quality of the hybrid annuity contractor's performance of the operations and maintenance requirements in conformance with the CA and the Maintenance Manual. The IE's Inspection Report shall specify the remedial actions that are being taken or have been agreed but not yet taken by the hybrid annuity contractor

with regard to reported lapses, defects, deficiencies, etc. The IE's Inspection Report may also specify deadlines for remedial actions and additional tests and traffic survey to be carried out by the hybrid annuity contractor for the purpose of assuring that the project highway remains in the condition that underlies the operations and maintenance obligations of the hybrid annuity contractor in the CA. The IE may inspect the project highway more than once in a month, if any lapses, defects, or deficiencies require such inspections.

51. **Closure of lanes.** The IE shall examine requests submitted by the hybrid annuity contractor for closure of lanes of the carriageway for maintenance and repair purposes, as well as related modifications of the highway. Within 3 days of receiving such requests, the IE shall determine the reasonableness of the hybrid annuity contractor's request, including provisions for minimizing traffic disruptions, ascertain the views of the Authority on closures and disruptions, and notify the hybrid annuity contractor, copied to the Authority. In case of reservations with the hybrid annuity contractor's request, the IE shall subsequently review the hybrid annuity contractor's revised request and communicate its final determination regarding the reasonableness of the revised request to the hybrid annuity contractor, copied to the Authority.
52. **Annuity payments.** The hybrid annuity contractor shall submit requests for annuity payments to the IE, in accordance with the applicable requirements of the CA and the IE shall make fair and reasonable assessments of such payment requests, including any bonus or reduction in annuity based on the monthly progress report on operations and maintenance. The IE shall adjust the hybrid annuity contractor's invoice, as necessary, and forward it with the associated documentation to the Authority for payment. While forwarding the invoice to the Authority, the IE may recommend payment in full or part thereof. The IE's recommendation shall reach the Authority within 15 days prior to the relevant annuity payment date.
53. **Repair/rectification.** In respect of any defect or deficiency referred to in Paragraph 3 of Schedule-K, the IE shall, in conformity with good industry practice, specify the permissible limit of deviation or deterioration with reference to the specifications and standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.
54. **Delay damages.** The IE shall determine if any delay has occurred in completion of repair or remedial works in accordance with the agreement, and shall also determine the damages, if any, payable by the hybrid annuity contractor to the Authority for such delay.
55. **Periodic maintenance.** The IE shall determine the Major Maintenance Completion Schedule and shall also issue a Periodic Maintenance Completion Certificate upon completion and inspection of major maintenance work, as specified under and in accordance with the provisions in the CA.
56. The IE shall monitor and review the curing of defects and deficiencies by the hybrid annuity contractor as set forth in Clause 19.4.
57. The IE shall undertake traffic survey, as and when required by the Authority, under and in accordance with Article 20.7 and Schedule-T.
58. The IE shall initiate necessary action to undertake the maintenance obligations of the hybrid annuity contractor at risk and cost of the hybrid annuity contractor in the event of its failure to carry out O&M, as per the provisions in the CA
59. The IE shall review the accident record of the highway and suggest remedial measures.

60. The IE shall submit the monthly progress report on O&M covering the maintenance requirements provided in the CA.

6. Duties and Functions Related to Divestment Requirements

61. Not earlier than 90 days before termination of the CA but not later than 15 days before the effective date of such termination and the initiation of the hybrid annuity contractor's divestment requirements, the IE shall verify, after giving notice to the hybrid annuity contractor of the time, date, and venue of such verification, compliance by the hybrid annuity contractor with the maintenance requirements, and if required, cause appropriate tests to be carried out at the hybrid annuity contractor's costs for this purpose. If the IE determines that the status of the highway requires repairs and other rectifications, in order to meet the divestment requirements, the IE shall assess the amount to be set aside for these repairs and rectifications and communicate its determination forthwith to the Authority and the hybrid annuity contractor. The source of funds to cover the amount to be set aside and the method of retention shall be agreed between the Authority and the hybrid annuity contractor, based on the IE's determination.
62. The IE shall ensure that all materials, tools, plant, equipment, facilities, etc., which have to be handed over to the Authority upon termination of the hybrid annuity contract. These are properly dismantled, packed, stored, and maintained until the official handing over to the Authority as provided in the CA.
63. The IE shall inspect the project highway once in every 15 days during a period of 120 days after termination for determining the liability of the hybrid annuity contractor under Article 39, in respect of the defects or deficiencies specified therein. If any such defect or deficiency is found by the Independent Engineer, it shall make a report in reasonable detail and send it forthwith to the Authority and the hybrid annuity contractor.

7. Determination of Costs and Time

64. The IE shall determine the costs, and/or their reasonableness, that are required to be determined by it under the CA.

8. Duties and Functions Related to Dispute Resolution

65. In the event of any disagreement between the hybrid annuity contractor and the Authority regarding any provision of the CA or issues of good industry practice, the IE shall determine and communicate to them its independent interpretation of such provisions and issues and the parties shall take the IE's interpretation into account in settling their disagreement.
66. When called upon by either the hybrid annuity contractor or the Authority or both to mediate and assist them in arriving at an amicable settlement of any dispute under the CA, the IE shall make itself available and use its best efforts to accommodate their mediation request and reach an amicable settlement.
67. If a dispute arises between the hybrid annuity contractor and the Authority in connection with any certificate, determination, instruction, opinion or valuation of the IE, either of them may refer the dispute to the Dispute Review Board, as provided in the CA. In such event, the IE shall cooperate with requests from the Dispute Review Board for additional information and meetings. The party referring the dispute to the Dispute Review Board shall notify the other party and the IE.

9. Miscellaneous

68. A copy of all communications, comments, instructions, drawings, or documents sent by the IE to the hybrid annuity contractor pursuant to this TOR, and a copy of all the test results with comments of the IE thereon, shall be furnished by the IE to the Authority forthwith.
69. The IE shall obtain, and the hybrid annuity contractor shall furnish in two copies thereof, all communications and reports required to be submitted, under this Agreement, by the hybrid annuity contractor to the Independent Engineer, whereupon the IE shall send one of the copies to the Authority along with its comments thereon.
70. The IE shall retain at least one copy each of all drawings and documents received by it, including as-built drawings, and keep them in its safe custody.
71. Upon completion of its assignment hereunder, the IE shall duly classify and list all drawings, documents, results of tests, and other relevant records, and hand them over to the Authority or such other person as the Authority may specify, and obtain written receipt thereof. Two copies of the said documents shall also be furnished in micro film form or in such other medium as may be acceptable to the Authority.
72. The IE shall assist the Authority and the hybrid annuity contractor in utility shifting, land acquisition, and rehabilitation and resettlement issues, which will affect the progress of works.
73. The IE shall assist the Authority during the Dispute Board meetings, arbitration proceedings, and any other hearing held by the statutory/legal body.
74. The IE will ensure effective coordination with the railways supervising staff during the construction of road over bridge/road under bridge (ROB/RUB) and advise the Authority regarding the status of ROB/RUB construction.

D. Team Composition and Qualification Requirements¹

75. **Key experts.** Curriculum vitae (CV) will be evaluated for the following positions:

	Position	Number of Persons	Person-Months			Total Person-Months
			Development	Construction	Operations	
1	Team Leader & Senior Highway Engineer	1	3	24	4.0	31
2	Deputy Team Leader & Senior Highway Engineer	3	2	24	1.0	81
3	Senior Bridge/Structural Engineer	2	1	12	3.0	32
4	Highway Design Engineer	2	3	7	0.0	20
5	Bridge Design Engineer	2	3	6	0.0	18
6	Geotechnical	1	2	3	0.0	5

¹ To vary based on project nature and size.

	Position	Number of Persons	Person-Months			Total Person-Months
			Development	Construction	Operations	
	Engineer					
7	Senior Pavement Expert	1	1	11	3.0	15
8	Senior Quality cum Material Expert	3	1	24	3.0	84
9	Traffic and Safety Expert	1	2	11	2.0	15
10	Environmental Expert	2	2	11	1.0	28
11	Social Expert	2	4	8	1.0	26
12	Financial Expert	1	3	2	1.00	6
13	Contract Expert	1	3	3	1.0	7
14	Legal Expert	1	1	3	1.0	5
Total						373

76. **Non-key experts.** The requirements should be assessed for the following positions by the bidder based on scope of work. Such CVs will not be evaluated but the CV should be submitted for approval of the client before mobilization:

	Position	Number of Persons	Total Person-Months
1	Survey Engineer	4	88
2	Assistant Highway Engineers	4	78
3	CAD Expert	2	39
4	Assistant Bridge Engineer	4	75
5	Environmental cum Safety Officer	2	39
6	Social Officer	2	34
7	Assistant Quality cum Material Engineer	4	78
8	Quantity Surveyor	2	36
9	Horticulture and Landscaping Expert	1	13
10	Surveyors	4	88
11	Laboratory Technician	4	77
Total			645

77. The above categories are indicative and the IE may decide upon the requirement based on the scope of work. The other inputs like support staff such as administrative, accounts, and assistants shall also be provided by the IE, of an acceptable type, and commensurate with the roles and responsibilities of each position to efficiently and effectively perform the services.

1. Qualification Requirements of Key Experts

78. **Team Leader and Senior Highway Engineer.** This is the most senior position and the expert engaged as the team leader shall be responsible for reviewing the entire project preparation and implementation activities of the hybrid annuity contractor. The expert shall check all the designs being prepared by the hybrid annuity contractor, ensure execution of works on site as per specification and standards, and continuously interact with the Authority and the Contractor. The expert shall undertake project site visits and shall guide, supervise, coordinate, and monitor the work of other experts in his/her team as well as those of the Contractor. The expert is responsible for day-to-day supervision of works for

implementing the project in accordance with the hybrid annuity contract agreement and report non-compliances to both the hybrid annuity contractor and the Authority. The expert is also responsible for certifying the payments and shall help in resolving the disputes between the hybrid annuity contractor and the Authority. The candidate should have a proven record of supervising, organizing and managing project preparation, and construction of highway projects of large magnitudes, as defined below, which are financed by international lending agencies and others. Knowledge of project management shall be an added advantage.

79. Qualifications and experiences:

- Minimum post graduate degree in civil, highway, or transportation engineering or equivalent from a recognized university.
- Minimum total professional experience of 20 years, including at least 2 years experience in highway development in EPC, annuity, or public-private partnership (PPP) projects.
- He/she should have handled the assignments as Team Leader/Deputy Team Leader or similar capacity of at least two construction supervision consultancy works and two Independent Engineer consultancy works of highways of EPC, annuity, or PPP projects involving 300 lane-kilometers or projects costing more than Rs8,950 million.
- His/her experience should include at least 3 years on similar projects in developing countries, including in Asia.
- Experience in preparation of detailed project reports (DPR) of highway projects.
- Knowledge of international best practices in latest conditions of contract, construction, contract management, and modern highway construction technology.
- Experience in operation and maintenance of major highway projects.
- Experience in contract dispute management.
- He/she should also be familiar with implementation aspects of safety, environmental management plans, and social safeguard plans.
- Experience in multilateral/bilateral agency aided projects will be given higher preference.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

80. **Deputy Team Leader and Senior Highway Engineer.** The expert shall check all the designs being prepared by the hybrid annuity contractor, ensure execution of works on site as per specification and standards, and continuously interact with the Authority and the Contractor. The expert shall undertake project site visits and shall guide, supervise, coordinate, and monitor the work of other experts in his/her team as well as those of the Contractor. The expert is responsible for day-to-day supervision of works for implementing the project in accordance with the hybrid annuity contract agreement and report non-compliances to both the hybrid annuity contractor and the Authority. The candidate should have a proven record of supervising, organizing, and managing of project preparation and construction of highway projects of large magnitudes, as defined below, financed by international lending agencies and others. Knowledge of project management shall be an added advantage.

81. Qualifications and experiences:

- Minimum postgraduate degree in civil, highway, or transportation engineering or equivalent from a recognized university.
- Minimum total professional experience of 15 years, including at least 2 years of experience in highway development in EPC, annuity, or PPP projects.

- He/she should have handled the assignments as Team Leader/Deputy Team Leader or similar capacity of at least one construction supervision consultancy works and one Independent Engineer consultancy works of highways of EPC, annuity, or PPP projects involving 300 lane-kilometers or projects costing more than Rs8,950 million.
- His/her experience should include at least 3 years on similar projects in developing countries, including in Asia.
- Experience in preparation of DPRs of highway projects.
- Knowledge of international best practices in latest conditions of contract, construction, contract management, and modern highway construction technology.
- Experience in operation and maintenance of major highway projects.
- Experience in contract dispute management.
- He/she should also be familiar with implementation aspects of safety, environmental management plans, social safeguard plans.
- Experience with multilateral/bilateral agency aided projects will be given higher preference.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

82. Senior Bridge Design Engineer. The Senior Bridge Design Engineer/Senior Structural Engineer 1 shall be responsible for checking the designs of bridges, culverts, rail over bridges (ROB), interchanges, and any other structure to be constructed in the project highway, guiding the field supervision teams in checking of reinforcement/cable laying operations, rectifying any apparent mistakes in respect of them, checking and controlling the proper mix designs, checking the adequacy of proper form-work, laying/compacting of concrete including curing operations. For this purpose, the expert will work in close coordination with the Senior Material Expert and the Contract Management Specialist to effectively control the quality of execution. The expert will be responsible for minor modifications in the design of bridges/culverts, wherever required during execution. The expert shall also review the rehabilitation measures to be proposed by the hybrid annuity contractor for existing structures based on site condition and structural requirement basis. His/her expertise shall include computer-aided design methods for civil/structural engineering with particular reference to structural design.

83. Qualifications and experiences:

- Minimum graduate degree in civil engineering. Preferably, postgraduate degree in structural engineering from a recognized university.
- Minimum professional experience of 15 years.
- 8 years out of total 15 years experience in similar capacity of Senior Bridge Design Engineer/Senior Structural Engineer for design of major highway bridges.
- Experience in designing four major highway bridges or flyovers having a length more than 200 meters.
- He/she should have at least 4 years experience in rehabilitation/repair/maintenance of bridges.
- Experience in innovative methods of construction of bridges (pre-cast segmental, cantilever construction, cable stayed bridge, suspension bridges, etc.), bridge design methods and standards, bridge design with use of computer-aided software, technical specifications and statistical quality control/assurance procedures for construction of different components of bridges.
- His/her experience as Senior Bridge Design Engineer/Senior Structural Engineer on a construction project in developing countries will be an added qualification.

84. Highway Design Engineer. He/she shall be responsible for the review of highway

designs and drawings using sophisticated computer software and also construction and O&M works. His/her expertise shall include computer-aided design (CAD) methods for civil/highway engineering with particular reference to CAD application to the geometric design for highway rehabilitation and/or upgrading projects.

85. Qualifications and experiences:

- Minimum graduate degree in civil engineering. Preferably, postgraduate degree in highway or transportation engineering from a recognized university.
- Professional experience of 15 years in highway works.
- Experience of at least 8 years (out of a total of 15 years) in highway designing works.
- He/she should have handled as Highway Design Engineer at least two major 2/4/6 laning highway projects.
- Exposure in computer software programs for design of highways.
- Experience in at least two highway projects having a length not less than 150 lane kilometers equivalent on PPP mode.
- Experience in developed countries would be preferred.
- Experience in those projects served less than 6 months will not be considered.

86. **Bridge Design Engineer.** He/she shall be responsible for assisting in checking the designs of bridges, culverts, ROBs, interchanges, and any other structure to be constructed in the project highway, guiding the field supervision teams in checking of reinforcement/ cable laying operations, rectifying any apparent mistakes in respect of them, checking and controlling the proper mix designs, checking the adequacy of proper form-work, laying/ compacting of concrete including curing operations. The expert shall also review the rehabilitation measures to be proposed by the hybrid annuity contractor for existing structures based on site condition and structural requirement basis. His/her expertise shall include computer-aided design methods for civil/structural engineering with particular reference to structural design.

87. Qualifications and experiences:

- Minimum graduate degree in civil engineering. Preferably, postgraduate degree in structural engineering from a recognized university.
- Minimum professional experience of 15 years.
- 4 years out of total 8 years experience in similar capacity of Bridge Design Engineer/Structural Engineer for design of major highway bridges.
- Experience in designing four major highway bridges or flyovers having a length of more than 200 meters.
- He/she should have at least 4 years experience in rehabilitation/repair/maintenance of bridges.
- Experience in innovative methods of construction of bridges (pre-cast segmental, cantilever construction, cable stayed bridge, suspension bridges, etc.), bridge design methods and standards, bridge design with use of computer-aided software, technical specifications, and statistical quality control/assurance procedures for construction of different component of bridges.
- His/her experience as Bridge Design Engineer/Structural Engineer on a construction project in developing countries will be an added qualification.

88. **Geotechnical Engineer.** The expert shall be continuously interacting with the hybrid annuity contractor to ensure planning, monitoring, and coordination of geotechnical and hydraulic investigations for the bridges and interpreting the findings thereof as per the standards and specifications of the hybrid annuity contract agreement.

89. Qualifications and experiences:

- Minimum graduate degree in civil engineering from a recognized university. Postgraduate degree is preferable.
- With total professional experience of 15 years in design/construction/ maintenance of highways.
- Out of 15 years, experience of 5 years in similar capacity as Geotechnical Engineer in construction supervision consultancy or Independent Engineer for the projects having a minimum 150-lane km or equivalent highway projects.
- Experience as Pavement/Geotechnical Engineer in construction supervision consultancy or Independent Engineer for at least two major highway projects.
- Experience in DPR preparation is an added advantage.
- He/she shall have experience in soil exploration for structure foundations and for high embankments.

90. **Senior Pavement Expert.** The expert shall be continuously interacting with the hybrid annuity contractor to ensure life cycle cost effectiveness and viable design of pavement as per the standards and specifications of the hybrid annuity contract agreement. The expert is responsible for day-to-day supervision of works of pavement to ensure implementation of the project as per the hybrid annuity contract agreement and to report non-compliance, if any, to the Team Leader. The expert shall also be responsible for ensuring complete adherence to maintenance standards during the construction and operation period. Thus, the position requires a pavement specialist with thorough knowledge and understanding of international best practices in the field of design, construction, and maintenance of flexible type of pavements, including latest codal stipulations and specifications.

91. Qualifications and experiences:

- Minimum graduate degree in civil engineering from a recognized university. Post graduate degree in highway engineering/pavement design is preferable.
- With total professional experience of 15 years in pavement design/pavement construction/pavement maintenance of highways.
- Out of 15 years, experience of 5 years in similar capacity as senior pavement specialist in construction supervision consultancy or Independent Engineer for the projects having a minimum 150-lane km or equivalent highway projects.
- Experience as Pavement/Geotechnical Engineer in construction supervision consultancy or Independent Engineer for at least two major highway projects.
- Experience in DPR preparation is an added advantage.
- Experience as a Pavement Specialist/Pavement Engineer in EPC, annuity, or PPP projects and experience in externally aided projects are desirable.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

92. **Senior Quality cum Material Expert.** He/she is responsible for monitoring and supervising works for compliance with quality standards and reporting non-compliance, if any, to the Team Leader. The expert shall establish the standards and procedures for monitoring of quality works. The expert shall review the test results of bore holes, quarry, and borrow area material to find out their strength characteristics and suitability for using them in construction. The expert shall inspect the hybrid annuity contractor's field laboratories to ensure that they are adequately equipped and capable of performing all the specified testing requirements of the contract. The expert shall look into the quality assurance aspect of the construction works and supervise the setting-up of the various

hybrid annuity contractor's rock crushers and bituminous mixing plants to ensure that the specified requirements for such equipments are fully met.

93. Qualifications and experiences:

- Minimum graduate degree in civil engineering from a recognized university. Post graduate degree in geotechnical engineering/foundation engineering/soil mechanics is preferable.
- With total professional experience of 15 years out of which at least 5 years as Senior Quality/Material Expert or in similar capacity in construction supervision consultancy works or Independent Engineer works in major highway projects.
- Experience as Senior Quality/Material Expert or in similar capacity in handling of at least two similar highway projects.
- He/she should have exposure in quality assurance programs in highway projects using modern technology.
- The candidate should have demonstrated capability of supervising the setting up, organization, and layout of the various hybrid annuity contractor field laboratories, monitoring the mobilization of the testing equipment to ensure that the laboratories are adequately equipped and capable of performing all the specified testing requirements of the contracts, and supervising the setting up of the various hybrid annuity contractor rock crushers and bituminous mixing plants to ensure that the specified requirements for such equipment are fully met. The candidate should have at least 3 years of experience in flexible pavement and bituminous mix designs.
- The candidate must be familiar with properties of road construction materials, technical specifications, and procedures of material tests and testing equipment, and should have past experience in working on road projects running on expansive soils.
- Experience as a Senior Quality/Material Expert in EPC, annuity, or PPP projects is preferred.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

94. **Traffic and Safety Expert.** He/she shall review and check the traffic analysis, projection, and assignment exercises to be carried out by the Contractor. The expert shall also review/design of intersections and interchanges, and the scheme for traffic management during construction period. The expert shall also study and comment on safety audit report/traffic management and safety plans prepared by the hybrid annuity contractor. The expert shall review and approve all the safety measures taken by the hybrid annuity contractor during the execution period at the site. Conformity to the safety requirements as per the hybrid annuity contract agreement requirements shall be checked and approved. This shall cover all the temporary structures, overhead launching girders, cranes, transverse gantries, equipments at pre-casting yard and at site, jack pushing operations of underpasses, and the level of awareness/training of the site staff of the Contractor. The expert will be also responsible for reviewing all temporary works/staging along with the structural/bridge engineer from the safety point of view. The safety expert will guide the field supervision teams and the hybrid annuity contractor's site officers in complying with adequate construction safety standards in worksites, plant sites, and quarry locations (if quarries are independently operated by the hybrid annuity contractors) and will undertake hands-on-training programs and conduct mock safety drills as required from time to time. The expert will be coordinating and controlling, through the Team Leader's office, all construction safety issues with the Road Safety Consultant deployed by the Authority and will be responsible for reporting and following up on construction safety issues/lapses as appropriate. The expert shall also look into the various accident

and other insurance coverages taken by the Contractor. The expert shall immediately report non-compliances to the Team Leader for taking immediate contractual remedies.

95. Qualifications and experiences:

- Minimum graduate degree in civil engineering from a recognized university. Post graduate degree in traffic/transportation engineering/transport planning is preferred.
- OSHAS (Occupational Health and Safety Assessment Series) certification will be preferred.
- With total professional experience of 15 years out of which 5 years experience shall be as Traffic and Safety Expert on major highway of similar nature.
- Worked as Traffic and Transport Expert in at least two similar projects in similar capacity.
- Experience in road safety audit of at least 2 nos highway project of similar complexity of projects having a minimum 150-lane km or equivalent including 1 nos at design stage.
- International exposure in the field of road safety management planning and experience in working with external aided projects are preferred.
- Experience with road safety aspects and traffic management during various phases, i.e., pre-construction, design/development/construction stage, safety audit, and studies of highway projects.
- Experience as a Traffic and Transportation Expert in EPC, annuity, or PPP project and experience in externally aided project are preferred.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

96. **Environmental Expert.** He/she shall develop, organize, and deliver environmental training programs and workshops for the staff of the Environmental Management Project Implementation Unit (EMPIU); the Karnataka Public Works, Ports, and Inland Water Transport Department (KPWD); the hybrid annuity contractor; the Site Supervision Engineers; and the PIU. The expert shall also review the hybrid annuity contractor's Environmental Management Plan (EMP) in accordance with the relevant requirements of ADB's Safeguard Policy Statement (2009) and loan and project agreements; supervise the implementation of the EMP by the hybrid annuity contractor; hold regular meetings with the EMPIU and Social Development and Resettlement Cell (SDRC) to exchange information on the issues emerging while implementing the EMP, forestry, and wildlife matters; develop good practice construction guidelines to assist the hybrid annuity contractor in implementing the EMP; assist the EMPIU and environmental monitoring consultants in periodic environmental monitoring (air, noise, water, etc.) programs to ensure compliance with the Karnataka State Pollution Control Board requirements and the EMP; assist the EMPIU to prepare and submit regular environmental monitoring and implementation progress reports; and assist the EMPIU to prepare good practice dissemination notes based on the experience gained from site supervision.

97. Qualifications and experiences:

- Minimum postgraduate degree in environmental engineering/environmental planning/environmental sciences from a recognized university.
- Professional experience of 15 years in environmental aspects of highway projects, e.g., environmental impact assessment, etc.
- Experience in implementation of the EMP in externally aided projects such as of the World Bank or ADB is essential.
- The expert should have adequate experience in implementing EMPs and

organizing training for the hybrid annuity contractor and Authority's staff.

- The expert should be familiar with requisite procedures involved in obtaining environmental and forest clearances for project roads passing through reserve forests, national parks, or sanctuaries, etc.
- In the capacity of Environmental Engineer, the expert should have handled at least two projects of similar size and complexity.
- The expert should have good knowledge of the Ministry of Environment and Forestry (MOEF) guidelines/requirements for mitigation measures.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

98. **Social Expert.** He/she shall develop, organize, and deliver social training programs and workshops for the staff of the KPWD, the Contractor, Site Supervision Engineers, and the PIU. The expert shall also review the Resettlement Plan (RP) in accordance with the relevant requirements of ADB's Safeguard Policy Statement (2009) and loan and project agreements; review and assist work at the site, duly liaising between the Contractor's staff and the PIU, to monitor and review social and gender issues; hold regular meetings with the Social Development and Resettlement Cell (SDRC) to exchange information on the issues in implementing the contracts; assist the PIU to prepare and submit regular social monitoring and implementation progress reports; and assist the PIU to also prepare good practice dissemination notes based on the experience gained from site supervision.

99. Qualifications and experiences:

- Minimum postgraduate degree in social sciences or related disciplines from a recognized university.
- Professional experience of 10 years in social aspects of transportation projects, e.g., social impact assessment (SIA), resettlement plans, etc.
- Experience in implementation of RP in externally aided projects such as of the World Bank or ADB is essential.
- The expert should have adequate experience in implementing RPs and organizing training for Contractor's and Authority's staff.
- In the capacity of Social Expert, the expert should have handled at least two projects of similar size and complexity
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

100. **Financial Expert.** The expert is responsible for verifying the financial model, package, and other financial instruments submitted by the hybrid annuity contractor. Any non-compliance shall be reported to the Team Leader. The expert shall assist the Team Leader in financial issues involved in the hybrid annuity contract agreement.

101. Qualifications and experiences:

- The candidate shall have a minimum qualification of MBA (Finance)/Chartered Accountant.
- He/she should have minimum 5 years experience as a Financial Advisor particularly in the field of project financing.
- Working experience in at least two annuity, or PPP projects, in similar capacity in similar projects of size and complexity.
- Advisory experience in the field of transportation projects would be desirable.

102. **Contract Expert.** He/she is responsible for reviewing the financial and legal agreements furnished by the hybrid annuity contractor. Any non-conformities and

contradictions with the hybrid annuity contract agreement are required to be reviewed and brought to the notice of the Authority and the Contractor through the Team Leader. The expert shall be available for giving his/her opinions on all contractual issues raised in administering the hybrid annuity contract agreement.

103. Qualifications and experiences:

- Minimum graduate degree in civil engineering from a recognized university or L.L.B from a recognized university.
- Lawyer or engineer with over 8 years experience in contracts and financial documentation related to project financing.
- Working experience in at least two annuity, PPP projects in similar capacity of reviewing the contract documents and project finance agreements.
- He/she shall be involved in implementing the hybrid annuity contract agreements and review of financial and other legal agreements furnished by the hybrid annuity contractor.
- Advisory experience in transportation would be desirable.

104. Legal Expert. He/she is responsible for reviewing the financial and legal agreements furnished by the hybrid annuity contractor. Any non-conformities and contradictions with the hybrid annuity contract agreement are required to be reviewed and brought to the notice of the Authority and the Contractor through the Team Leader. The expert shall be available for giving his/her opinions on all legal issues raised in administering the hybrid annuity contract agreement.

105. Qualifications and experiences:

- Minimum degree of L.L.B from a recognized university.
- Lawyer with over 8 years experience in contracts and financial documentation related to project financing.
- Working experience in at least two annuity, PPP projects in similar capacity of reviewing the contract documents and project finance agreements.
- He/she shall be involved in implementing the hybrid annuity contract agreements and review of financial and other legal agreements furnished by the hybrid annuity contractor.
- Advisory experience in transportation would be desirable.

2. Qualification Requirements of Non-Key Experts

106. Survey Engineer

- The candidate should be a graduate in civil engineering from a recognized university.
- At least 6 years experience in the field of surveying, out of which 3 years should be for highway projects.
- He/she should have been involved in at least one similar highway project.
- The firm may deploy a Survey Engineer with diploma in civil engineering/survey with at least 10 years of experience in the field of surveying out of which at least 5 years should be in highway projects, and they should have also dealt with at least one project of similar nature.
- This position requires thorough understanding of modern computer-based methods of surveying with total station digital level, etc.
- Should have handled at least two major highway projects of similar size and complexity.

- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

107. Assistant Highway Engineer

- Graduate in civil engineering from a recognized university.
- Professional experience of 6 years in supervision of highway projects.
- Should have handled at least 1 major 2/4/6 laning project of similar size and complexity.
- Experience with highway project on EPC, annuity, or PPP mode.
- Experience in externally aided projects is desirable.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

108. CAD Expert

- Graduate/diploma in civil engineering from a recognized university with experience in computer-related design method for highway engineering.
- Professional experience of 6 years in CAD or similar design software.
- Should have worked on at least 2 major highway projects of similar size and complexity.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

109. Environmental cum Safety Officer

- Minimum graduate degree in environmental engineering or related sciences from a recognized university.
- Professional experience of 6 years in environmental aspects of highway projects, e.g., environmental impact assessment, etc.
- Experience in implementation of EMP in externally aided highway projects is essential.
- Experience in road safety audit of at least 2 nos highway/expressway projects of similar complexity, with a minimum 150-lane km or equivalent including 1 nos at design stage.
- Exposure in the field of road safety management planning and experience in working with externally aided projects are preferred.
- Experience in road safety aspects during various phases, i.e., pre-construction, design/development/construction stage, safety audit, and studies of highway projects.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

110. Social Officer

- Minimum graduate degree in social sciences or related discipline from a recognized university.
- Professional experience of 6 years in social and resettlement and rehabilitation (R&R) aspects of highway projects, e.g., SIA, RP, etc.
- Experience in implementation of RP in externally aided projects is essential.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

111. Assistant Bridge Engineer

- Graduate in civil engineering from a recognized university.
- Professional experience of 6 years in bridge design.
- 2 years out of total 6 years experience in similar capacity for design of major highway bridges.
- Experience in designing two major highway bridges.
- Design experience of major highway bridge of length 200 m or more (excluding approaches).
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

112. Assistant Quality cum Material Engineer

- Graduate in civil engineering from a recognized university.
- Professional experience of 6 years.
- Experience of at least 2 years as Quality/Material Expert or in similar capacity in Construction/Construction Supervision/major highway projects. Experience in latest quality management techniques in highway projects using modern technology.
- Experience as Quality/Material Expert or in similar capacity in handling of at least two similar highway projects of similar size and capacity.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

113. Quantity Surveyor

- Graduate in civil engineering from a recognized university.
- Professional experience of 6 years.
- Experience of at least 2 years as Quantity Surveyor or in similar capacity in construction/construction supervision/major highway projects.
- Experience as Quantity Surveyor in EPC, annuity, PPP project.
- In similar capacity, the expert should have handled at least two similar projects of similar size and complexity.
- Project experience less than 1 year in any project will not be considered in determining the experience in number of projects.

114. Horticulture and Landscaping Expert

- B.Sc (Agriculture) degree from a recognized university with horticulture as a subject, preferably with postgraduate degree in horticulture specialization.
- Minimum 10 years experience in the area of horticulture/landscaping with 5 years experience in relevant field.

115. Surveyors

- The candidate should be a graduate in civil engineering from a recognized university.
- At least 2 years experience in the field of surveying out of which 1 year should be for highway projects.
- He/she should have been involved in at least one similar highway project.
- The firm may deploy a Survey Engineer with diploma in civil engineering/survey with at least 5 years experience in the field of surveying out of which at least 2

years should be in highway projects, and they should have also dealt with at least one project of similar nature.

116. Laboratory Technicians

- The candidate should be a graduate from a recognized university.
- At least 2 years experience in the field out of which 1 year should be for highway projects.

E. Reporting Requirements and Time Schedule of Deliverables

	Activity/ Output	Timeframe for Delivery	Key Experts Person-Months Proposed for Input			Copies
			Development	Construction	Operations	
1	Inception Report	3 weeks of mobilization	18			5
2	Monthly Technical Report	7th of each month	7	159	-	5
3	Quarterly Report	15th of each quarter month	7	80	10	5
4	Additional Technical Report	Periodically as applicable	18	50	-	5
5	Draft Completion Report	3 weeks of completion of construction	-	-	6	5
6	Monthly Progress Report (O&M)	Monthly during operations period	-	-	12	5
7	Closure Report	On completion of hybrid annuity contract	-	-	6	5

1. Inception Reports (5 copies)

117. The Inception Report shall outline how the IE will implement the project. It shall illustrate the planning that the IE has done for the assignment, staffing, and comments as deemed appropriate. The Authority will comment on the report.

118. The Inception Report must be submitted within 3 weeks after mobilization and should also describe the final format the IE proposes to use for the Monthly Technical Reports.

2. Monthly Technical Reports (5 copies)

119. The IE shall, no later than the 7th of each month, deliver a brief progress report summarizing the work accomplished by each of the supervision teams for the preceding month. The Monthly Technical Report shall report on the health and safety, physical progress, status of payment of the contractor's monthly payment certificates, all claims for cost or time extensions, and actions required by the Authority to permit unconstrained works implementation. It shall include problems encountered and recommended solutions, and a summary of the log from the meetings with the hybrid annuity contractor. The draft outline for the monthly report is below.

- (i) Health and safety in the work sites (the hybrid annuity contractor must keep a log of accidents by category);
- (ii) Physical progress vis-à-vis the planned progress, including time and costs, and weekly progress log and issues on the construction sites;
- (iii) Explanations for variances to the above;
- (iv) Expenditures vis-à-vis the cash flow forecast and budget; furthermore, the IE shall prepare a detailed report on draw down of equity and debt from the Escrow Account;
- (v) Explanations for variances to the above;
- (vi) Status of hybrid annuity contractor claims and disputes, including hybrid annuity contractor claims for time extension and compensation, variation order (change of scope) proposed and approved;
- (vii) Human resources, mechanical equipment, and materials;
- (viii) Testing and quality control and inspections carried;
- (ix) Stakeholder issues;
- (x) Environmental management plan;
- (xi) Summary of problems encountered (administrative, technical, financial, etc.) and actions already taken or expected to be taken by the IE, or requested from the hybrid annuity contractor to overcome these problems;
- (xii) Other relevant material and discussions;
- (xiii) Annexes: Deviation Report, and other supporting information as necessary;
- (xiv) Summary of existing encumbrances like trees, electrical poles, water lines, underground utilities, public buildings, etc. The time program commensurate with hybrid annuity contractor work program to relocate these encumbrances;
- (xv) Status of land acquisition.

3. Quarterly Reports (5 copies)

120. The IE will prepare a report summarizing all supervision activities at the end of each quarter no later than the 15th of each quarter month. It should have roughly the same format as the monthly report, supplemented by the Third Party Quality Monitoring Team's key findings and the IE's responses to them.
121. The IE's quarterly report needs to contain quarterly cash flow projections in a format acceptable to the Authority (PIU-KSHIP). It should also identify updated budget estimates for all outstanding work.
122. The Quarterly Report shall also include the matrix of the hybrid annuity contractor's deviation report and results on the quality assurance program, showing both the recent performance and overall trends. The IE shall submit a draft format for this report in the inception report.
123. The IE shall prepare a separate bi-annual Environmental Social Safeguard Monitoring and Supervision Report, which includes changes in the environmental parameters supported by laboratory test results as set out in the environmental management plan (EMP). The report shall also quantify and assess the efficacy of the environmental impact mitigation measures and recommendations of the best practices.

4. Additional Technical Reports (5 copies)

124. The IE shall prepare design reviews and other technical reports during the project from time to time. In particular, technical reports are necessary for each major design change from the preliminary engineering design. Approvals prior to the issuance of substantial changes need to be included.

5. Draft Completion Report (5 copies)

125. The IE will prepare the Draft Completion Report within 3 weeks of the completion of the construction works and issuance of the completion certificate in terms of the provisions of CA clause 14.2. The Draft Completion Report will provide an overview of the project and whether the project has been successful. The report will include, but not be limited to, the following:

- (i) Overall review of the project, including safety and health data during project execution;
- (ii) Project timeline for completion and physical progress versus the original program;
- (iii) Project costs versus the original budget;
- (iv) Key issues in the design and explanations for variances to the preliminary design;
- (v) Description of additional work and claims, and their disposition;
- (vi) The final Quality Deviation Matrix;
- (vi) Other information that are requested by the Authority during project implementation;
- (vii) The Third Party Quality Monitoring Team's Final Report as an Annex; and
- (viii) The IE will also consolidate all forms of communications between the project stakeholders and shall submit the same to the Authority segregated on a monthly basis.

6. Monthly Progress Report during O&M Period (5 copies)

126. The IE shall submit the monthly progress report on O&M covering compliances against the maintenance requirements as provided under Schedule K and as per other relevant sections of the CA.

7. Closure Report – Project Hand-Back Report (5 copies)

127. The IE will prepare the Project Hand-Back Report within 3 weeks of the completion of the hybrid annuity contract period. The Project Hand-Back Report will provide an overview of the project and whether the project has been successful. The report will include, but not be limited to, the following:

- (i) Overall review of the project, including safety and health data during project execution;
- (ii) Description of additional work and claims, and their disposition;
- (iii) Other information that are requested by the Authority during project implementation;
- (iv) The IE will also consolidate all forms of communications between the project stakeholders and shall submit the same to the Authority segregated on a monthly basis;
- (v) Compliance by the hybrid annuity contractor with the maintenance requirements;
- (vi) Handback of all materials, tools, plant, equipment, facilities, etc., pertaining to the project highway that shall be handed over to the Authority by the hybrid annuity contractor; and
- (vii) Reports on any liabilities or defects or deficiencies pertaining to the project highway.

128. A review committee comprising the following officers of the PIU-KSHIP will be reviewing all the reports submitted by the IE and will provide comments, if any, within 15

days:

- (i) Chief Project Officer, PIU-KSHIP
- (ii) Project Director, PIU-KSHIP
- (iii) Superintending Engineer, PIU-KSHIP

F. Client's Input and Counterpart Personnel

129. Following are the services, facilities, and property to be made available to the IE by the client.

1. Data and Services

- (i) The entire copies of contract package hybrid annuity contract agreements, including bidding documents.
- (ii) Necessary letters that will be required for visas of foreign personnel and procuring other services by the IE for performing project services.

2. Accommodations, Communications, and Vehicles

130. The IE will be responsible for making their own arrangements for all their accommodation (including the office of the Team Leader and associated staff stationed in Bangalore and their site staff). The IE should also make their own arrangements for office furniture, equipment, stationeries, photocopiers, and communication facilities such as telephones, web connections, facsimiles, etc., and vehicles for transportation of office staff/field staff, etc. (including operation, maintenance, insurances, and repairs thereof).

3. Laboratory Facilities

131. Access will be provided to the hybrid annuity contractor for establishing the quality control laboratory. The hybrid annuity contractor will establish and maintain the laboratory, including testing equipment, water supply, electricity and cooling/heating equipment, which shall be made available for use by the IE. Maintenance of the laboratory by the hybrid annuity contractor shall include the costs of electricity, water, and all consumables for testing. The hybrid annuity contractor will be responsible for carrying out tests for quality of soils/materials, etc. The IE shall be required to monitor lab testing and to carry out test checks as necessary to verify compliance with the hybrid annuity contract agreement.

G. Performance Clause

132. The IE shall be expected to fully comply with all the provisions of the terms of reference, and shall be fully responsible for supervising the designs, construction, maintenance, and operation of the facility in accordance with the provisions of the hybrid annuity contract agreement and other schedules. Any failure of the Independent Engineer to notify the Authority and the hybrid annuity contractor of non-compliance with the provisions of the hybrid annuity contract agreement and other schedules by the hybrid annuity contractor, and non-adherence to the provisions of the TOR and non-adherence to the time schedule prescribed under the TOR, shall amount to non-performance.

TERMS OF REFERENCE FOR ROAD SAFETY CONSULTANT (FIRM)

A. BACKGROUND

1. The Government of Karnataka (GOK) has secured a loan from the ordinary capital resources of the Asian Development Bank (ADB) to finance the Karnataka State Highway Improvement III Project (KSHIP-III) with the primary objective of improving state highways (SH) under hybrid annuity contracts. The GOK intends to utilize part of this loan to cover the cost of the contract for consulting services related to road safety for the project. A project implementation unit (PIU) under the Karnataka Public Works, Ports, and Inland Waterways Department (KPWD) is the implementing agency (IA) for the project. It is called the Project Implementation Unit of Karnataka State Highways Improvement Project (PIU-KSHIP).

2. **State context.** Karnataka state in the southwest of India has an area of about 192,000 square kilometers and a population of about 64 million.¹ Karnataka is among the better performing states in the country in terms of economic growth. Its per capita income is about 10% higher than the national average, which grew over 10% annually from fiscal year (FY) 2012 to FY2016. It also has a lower population density and a higher female to male ratio of 963 per 1,000 males as against the national ratio of 943.² Unemployment and poverty rates are also lower than the national averages, and the state receives substantial foreign direct investment, the third highest in the country behind the National Capital Region and Maharashtra state.³

3. **Transport network.** In terms of transportation, the rail network in the state is rather sparse, with a route of only about 3,000 kilometers (km), mostly on single line. Because of the steep terrain along the western hill ranges, east–west rail connectivity is limited to just one line from Hassan in the hinterland to Mangalore on the west coast. The road network is therefore a critical element of the economic infrastructure. Under ADB TA 7324-IND, Technical Assistance for Karnataka State Highway Network Improvement, consultants completed a study for identifying a “core road network” (CRN) in the state, as given in the following table:⁴

Table 1: Core Road Length

Administrative Class	Total (km)
National Highways (NH)	4,491
State Highways (SH)	18,470
Major District Roads (MDR)	1,265
Total	24,226

km = kilometer.

Source: Asian Development Bank estimates.

4. **Road Safety.** In 2014, Karnataka roads accounted for 43,694 accident cases (9.7% of national accidents) resulting in 10,444 fatalities (7.4% of national road deaths), making it one of the most unsafe states in the country. Karnataka was ranked at third place in the number of accidents and fatalities per 100,000 of the population, and in fourth place in the number of

¹ Government of Karnataka, Directorate of Economics and Statistics. Bengaluru, 2015. <http://des.kar.nic.in/docs/sip/GSDP%202015-16AE.pdf>

² Government of India, www.data.gov.in

³ Government of India. *Economic Survey, 2015–2016*. New Delhi.

⁴ Prepared under ADB TA 7324-IND, Technical Assistance for Karnataka State Highway Network Improvement, by consultant M/S Scott Wilson India Pvt. Ltd.

accidents and fatalities per 100 km of roads. Though the number of accidents in Karnataka declined from 44,731 to 43,694 from 2011 to 2014, the number of fatalities increased from 8,971 to 10,444 in the same period. Karnataka State Highways covering 20,770 km accounted for 31%–33% of accident cases, injuries, and deaths, which mean that on an average day, 37 cases of accidents are reported, causing injury to 51 people and 9 deaths. Majority of the accidents reported are driver related. However, accidents due to other reasons such as lack of road infrastructure, vehicles parked at road shoulders with trucks, lorry, buses (22%), bicycle, pedestrians and others (11%), and accidents during night time (43%), are also significant. Significant fatalities are from vulnerable groups of road users (pedestrians, bicyclists, and two-wheelers).

5. To improve road safety in the state, the GOK has formulated “Karnataka State Road Safety Policy 2015” with a vision of “A safe road network for all road users, with priority to pedestrians and cyclists, to achieve zero road accidents in the long run.” Its mission is to reduce road accidents by 25% and fatalities by 30% by the year 2020.

6. **Government strategy.** While economic development in Karnataka has been good, it has also been uneven, mainly focused around the capital region of Bengaluru and Mysuru, and the coastal towns of Mangaluru and Udupi. Given its poor rail network, Karnataka is heavily dependent on its road network for linkage between the rural and urban economies. In its state road policy (2009), GOK recognizes the importance of road development as an engine of economic growth, and proposes to develop all the state highways to two-lane width.⁵ To achieve this objective, GOK has been using a combination of budgetary, public–private partnership, World Bank, and ADB financing to improve state roads. In 2001, KSHIP-I was undertaken as a World Bank project for \$360 million, addressing about 2,400 km of roads. KSHIP-II is ongoing, covering about 1500 km of roads, and has two parts: a World Bank approval in 2011 for a \$350 million loan, and an ADB approval in 2010 for a \$315 million loan.⁶ However, the development of the CRN roads requires further substantial funding, estimated at \$1.7 billion, and the government has to continue this process through a mix of funding sources. KSHIP-III will have two main components:

- (i) **Civil works component.** The scope of this component shall include upgrading/reconstruction/widening of a selected 418 km of state highways from the CRN based on the available budget.
- (ii) **Road safety component.** This comprises a comprehensive and coordinated package of road safety sub-components.

7. The PIU-KSHIP wishes to engage a team with multidisciplinary expertise, hereinafter called the Road Safety Consultant (RSC), to carry out the broad scope of work under the road safety component.

B. OBJECTIVE OF THE ROAD SAFETY COMPONENT

8. The overarching objective of the consultancy services is to provide quality technical support to assess, design, and supervise defined road safety features on the state highways in the core road network of Karnataka. In achieving these objectives, the RSC is required to provide all requisite assistance and support to the PIU-KSHIP in compliance with ADB’s policies for project design and implementation. The RSC is encouraged to refer to these policies available on

⁵ Public Works Department Karnataka. *Karnataka Road Sector Policy (2009)*. Bengaluru.

⁶ 42513-013: Karnataka State Highway Improvement Project.

ADB's website (<http://www.adb.org/documents/handbook-project-implementation>) before submitting the proposal and during delivery of services. The works contract for road safety components may be based on ADB's standard bidding document for works in India, as amended from time to time for national competitive bid procured contracts.

C. SCOPE OF THE ROAD SAFETY COMPONENT

9. Under KSHIP-III, the selected Road Safety Consultant will (i) conduct a detailed safety audit of the state highways (SH) under the CRN (approximately 18,000 km), including roads taken up under the project; (ii) propose designs and drawings for improving identified accident-prone locations (black spots); and (iii) supervise the contractor(s) implementing such improvement measures.

10. The key tasks of the services, shall include, but not be limited to, the following:

1. Task I - Road Safety Audit

- (i) The RSC will carry out a safety audit of **all SHs in the CRN**, including roads taken up under KSHIP-III (including the junctions with other SH, national highways). The audit will, among other things, examine and determine accident statistics (fatal, grievous, others), map them by approximate location, identify causative factors.⁷
- (ii) The RSC will prioritize spots for corrective measures and prepare a Safety Audit Report.

2. Task II – Engineering Surveys and Design

- (i) Based on this prioritization of accident spots where engineering interventions can help, the RSC will carry out the necessary engineering surveys, including traffic surveys, topography surveys, material investigation, etc.
- (ii) The RSC will prepare designs and drawings for addressing them in an optimal cost way. Typical measures will include but not be limited to signage, dividers, junction traffic management installations (passive and active), S-curve improvements, and so on.

3. Task III – Procurement

- (i) The RSC will prepare bid documents for civil works under national competitive bidding. The project cost for this is estimated to be about \$15 million.
- (ii) The RSC will help the client in procurement of contractor(s) for carrying out these safety enhancement features.

4. Task IV – Construction Supervision

- (i) The RSC will be responsible for all construction supervision activities for such road safety works to ensure that works are carried out as per required quality and specifications with due regards to environmental, social, and safety aspects in compliance with the contract conditions, environmental management plan, and

⁷ In many cases, if not a majority, the cause is indicated as "driver error." This is a catchall phrase that covers various contributions such as engineering related (poor curves, junctions, sight distances, road conditions), awareness related (pedestrians running across), and so on. Data should be properly assessed and marked.

international best practices for road construction.

- (ii) The RSC shall assume delegated powers, duties, and responsibilities assigned to the “Engineer” under the civil works contracts by the employer.
- (iii) The RSC will prepare an overall plan and schedule for the project in sufficient detail to ensure all important activities are identified; clearly show linkages between activities; allow monitoring of progress; provide early indications of potential problems; and enable interventions by the PIU-KSHIP, other consultants, and contractors to maintain the project schedule. This plan will require updating at regular, frequent intervals.
- (iv) The RSC will assist the PIU-KSHIP in the preparation of the overall project implementation program, including pre-construction activities, procurement, financial management, and implementation.
- (v) The RSC will monitor actual physical progress and costs against plans and budgets and prepare detailed Monthly Progress Reports on activities, progress, and costs of all project components. The report will be a summary of progress reports prepared by contractors, consultants, and other agencies in all components of the project. The contents and formats of the report will be agreed with the PIU-KSHIP.
- (vi) The RSC will review compliance with the documentation, including securing of all statutory clearances and permits or handing over of site, and advise on issuing the notice to set the commencement date.
- (vii) The RSC will assess the achievement of project development objectives through monitoring of result framework indicators agreed between the PIU-KSHIP and ADB (outcomes and outputs in the design and monitoring framework [DMF]).
- (viii) The RSC will prepare environmental and social safeguards reports in the formats prescribed by ADB. It will support the PIU-KSHIP in matters relating to safeguards, including updating the resettlement plan, monitoring the implementation of the resettlement plan, and providing expert advice in all matters relating to acquisition and resettlement.
- (ix) The RSC will advise the PIU-KSHIP on safeguard compliance issues, and, if necessary, a corrective action plan will be prepared to address such issues.
- (x) The RSC will monitor project costs and provide an updated forecast of costs at completion in the Quarterly Progress Reports. It will alert the PIU-KSHIP and ADB of unexpected major cost overruns at the earliest possible time.
- (xi) The RSC will participate in various discussions/meetings/missions as may be called upon by ADB and provide required information and documents.

5. Task V – Training Program and Awareness Campaign

- (i) The RSC shall develop a training program that will consist of a series of modules/workshops to introduce and then reinforce principles of safe road design,

best international practices in designs, and practical exercises. The training should be aimed at the staff of KSHIP/consultants/contractors:

- 2-day training program for KSHIP/local consultants for at least 20 members at the end of the road safety audit of CRN.
 - 1-day training for contractor engineers for safety related issues during construction.
- (ii) As part of road safety awareness campaign will undertake road safety improvement related activities, including conducting awareness campaigns, community theaters, and use of promotional materials in settlement locations along the project road corridor. Educational institutions at least 10 locations in Educational Institutes for students and at least 10 locations in community centers in settlement locations post-delivery of Final Report.

D. REVIEW OF OUTPUTS AND DELIVERABLES

11. The RSC's main outputs and deliverables will be reviewed by the Steering Group consisting of the following members:

Table 2: Composition of Steering Group

1	Additional Chief Secretary/Principal Secretary KPWD-Chairperson	Chairperson
2	Secretary KPWD	Member
3	Chief Project Officer, KSHIP	Member, Secretary
4	Project Director KSHIP	Member
5	Chief Engineer, PRAMC	Member
6	Chief Engineer, KRDCCL	Member
7	Chief Engineer, NH Division	Member
8	Chief Engineer, C & B (North)	Member
9	Chief Engineer, C & B (South)	Member

C & B = communications and buildings, KPWD = Karnataka Public Works, Ports, and Inland Water Transport Department, KRDCCL = Karnataka Road Development Corporation Limited, KSHIP = Karnataka State Highways Improvement Project, NH = national highway, PRAMC = Planning and Road Asset Management Centre.

E. TIMEFRAME

12. The estimated duration of services will be 36 months, including the construction period for RSC contract(s), which is about 24 months.

F. DATA AND RESOURCES TO BE PROVIDED BY PIU-KSHIP

13. The following data and resources will be provided by PIU-KSHIP:

- (i) Available base maps; existing road inventories, including data on pavement history and condition; traffic statistics; road crash fatality and serious injury statistics; geographical maps of all districts, including category of roads thereon as per IRC: 1981–2001 Road Development Plan.
- (ii) Detailed project reports prepared for the projects, designs/drawings of bridges, and roads including sub-soil investigation reports.
- (iii) Because of limited office space in the PIU-KSHIP office, the RSC will need to make all other office, accommodation, and equipment arrangements.

G. KEY PERSONNEL REQUIREMENTS AND ESTIMATED INPUTS

14. The positions and qualifications of proposed key professionals and corresponding person-months (including intermittent deployment) of the RSC are indicated in Table 3 below:

Table 3: Key Professional Personnel of Road Safety Consultant

Si. No.	Key Professionals and Qualification	Person-months
1	Team Leader cum Road Safety Expert: Post-graduate from a recognized university with specialization in highways/transportation, with minimum 20 years of experience and should have worked as Team Leader in at least 3 national highway (NH)/state highway (SH) projects in detailed project report (DPR) preparation, including road safety component. Experience in multilateral funding agency projects will be an added advantage. Experience in road safety/work zone safety audit assignments or traffic/transport planning is a must.	18
2	Deputy Team Leader (Traffic and Transportation): Graduate in civil engineering from a recognized university, with minimum 10 years of experience in highway sector in senior position associated with DPR preparation/supervision/construction/safety audit/work zone safety/ traffic planning, etc. of 2/4 laning highway projects.	24
3	Highway Engineer: Graduate in civil engineering from a recognized university, with minimum 2 to 3 years DPR project preparation experience as highway engineer for 2/4 laning of SH/NH.	24
4	Senior Material Engineer cum Quality Control Engineer: Graduate in civil engineering from a recognized university, with 10 years of experience and, at the minimum, with supervision experience in 3 projects as soil and material expert for 2/4 laning of SH/NH.	24
5	Resident Engineer (3): Graduate in civil engineering from a recognized university, with 10 years of experience, minimum two years of supervision project experience as resident engineer for 2/4 laning of SH/NH.	36
6	Senior Surveyor (2): Diploma (preferably Graduate), with minimum 5 years of experience. The candidate must have handled survey works independently for major highway projects. Thorough knowledge and experience in the application of modern survey methods using total station and GPS, and presentation of survey information based on digital terrain modeling, are essential	48
7	Senior CAD Expert: Graduate in civil engineering with minimum 5 years of experience in highway project as CAD expert, ability to design the safety features, prepare land acquisition, utility relocation drawings, etc.	24
8	Environmental Specialist: Graduate in environmental sciences, with 10 years of experience in environmental impact assessment of development projects, and conversant with World Bank/ADB requirements under ADB's Safeguard Policy Statement.	18
9	Social Development Specialist: Graduate in sociology, with 10 years of experience of working as social expert for major road project(s) of similar nature.	24
10	Contract Administration Specialist: Graduate/MBA/Masters in Commerce, with at least 10-year work experience, including working in multilateral funded highway projects of 2/4 laning of SH/NH projects, with at least 2 projects as contract specialist.	24
	Total	264

15. Key professionals at positions 1–3 in Table 3 must be from the lead/principal firm in case of association, failing which, the proposal shall be non-responsive in the technical evaluation.

16. The RSC team will have to both work and be located in its main offices in Bengaluru, and in a suitable number of field offices.

17. The above key professional positions are minimum requirements. The RSC has to propose additional non-key technical support staff and administrative staff, as required, to best meet the objectives of the assignment. The INDICATIVE list of Non-Key Professionals is given in the following table, but is for guidance only. However, the numbers and person-months for such staff shall be included in the technical proposal, and the costs in respect of these personnel are to be included in the financial proposal, and will be deemed to have been so included. Curriculum vitae (CV) shall be provided at the time that the post is to be filled. Candidates shall meet the requirements for responsiveness of that position, as per good engineering practice.

Table 4: Non-Key Professionals of Road Safety Consultant

	[INDICATIVE] Non-Key Professionals	No. of Persons	[INDICATIVE] Person-months
1	Quantity Surveyors	2	48
2	Field Engineers	4	96
3	Surveyors	4	96
4	CAD Draftsmen	2	48
5	Lab Technician	4	96
	Total		384

18. The RSC shall, if so required by the PIU-KSHIP, provide any additional service at rates or on person-month rates as per the contract, or as mutually agreed upon, as a variation order.

19. Traffic surveys and topographic surveys will be covered under provisional sums. However, these have to be assessed, coordinated, and analyzed by the professional staff of the RSC.

20. Training and awareness programs and/or materials will be covered under provisional sums. However, these have to be prepared and conducted by the professional staff of the RSC.

H. FACILITIES TO BE PROVIDED BY THE RSC

21. The RSC shall be required to provide their own office accommodation, support staff, equipment, communication and IT facilities, transportation, and all resources, amenities, and facilities required to complete the services.

I. OUTPUTS AND TIMEFRAME FOR DELIVERABLES

22. The RSC's assignment is driven by performance of the services in the field, and not by reports. However, the RSC shall submit the following reports, in a form and manner to be finalized between the PIU-KSHIP and the RSC (Tables 5 and 6):

Table 5: Reporting Requirements on Road Safety Audit

S. No.	Report	Timeline
	Development Stage	
1	Inception Report and Quality Assurance Plan Report	Within 21 days of contract signing
2	Draft Safety Audit Report, Designs and Draft Bid Documents	Within 6 months of contract signing
3	Final Safety Audit Report and Designs	Within 7.5 months of contract signing
4	Final Bid Documents for Civil Works	Within 8 months of contract signing
5	Monthly Progress Report	5th of every month

Table 6: Reporting Requirements on Construction Supervision

S. No.	Report	Timeline
Development Stage		
1	Monthly Progress Report	5th of every month from 1 month post signing of contract
2	Inception Report and Quality Assurance Plan Report	Within 20 days of contract signing
3	Quarterly Progress Reports	By the 5th of the first month of the following quarter (in lieu of the monthly progress report)
4	Final Report	1 month after completion of the works (provisional acceptance)

J. PAYMENT SCHEDULES

23. The Consultant will quote two separate financials: (i) road safety audit and design preparation, and (ii) construction supervision consultancy.

24. **Road safety audit.** The payment schedule shall be as follows (Table 7):

Table 7: Payment Schedule for Road Safety Audit

S. No.	Report	Timeline
1	Inception Report and Quality Assurance Plan Report	10%
2	Draft Safety Audit Report, Designs and Draft Bid Documents	45%
3	Final Safety Audit Report and Designs	30%
4	Submission of Final Bid Documents	15%

25. **Construction supervision.** The deployment of the Consultant's personnel shall be in line with the progress of work at site/design approval requirement and the same shall be finalized in concurrence with the client. The Consultant shall deploy the personnel keeping view of this and the contract price, and the same shall be appraised to the client for observations/concurrence. The decision of the client regarding deployment is final and binding. The monthly installment fee shall be paid on submission of monthly reports and attendance extracts of the Consultant's personnel certified by the concerned KSHIP engineer. However, the payments for each month shall be made based on the deployment of the Consultant's personnel for particular months.

26. The total consultancy fee payable will be paid in 26 equal installments. The first 24 installments will be paid during the construction period on submission of monthly reports and attendance extract of the Consultant's personnel (duly certified for satisfactory service carried out to be attested on the attendance sheet from the concerned Executive Engineer, KRDCCL for the field staff). The 25th installment will be paid after scrutiny and admittance of the final bill of the contractor on completion of their work. The 26th installment will be paid after the defects liability period and the Final Report.

Terms of Reference for Implementation Support Consultant

A. Introduction

1. The Government of Karnataka (GOK), acting through the Public Works, Ports, and Inland Waterways Department (KPWD) is implementing a project with financial assistance from the Asian Development Bank (ADB). The Karnataka State Highways Improvement III Project (KSHIP-III, the Project), costing about \$600 million, will improve about 400 km of state highways (SHs) in the state of Karnataka, and contribute to road safety and sustainable maintenance.

2. The project will be implemented by a dedicated Project Implementation Unit (KSHIP-PIU), headed by the Project Director, established at the KPWD office in Bengaluru. The KSHIP-PIU would be responsible for overall project management, financial management and procurement, and monitoring and evaluation. In addition, KSHIP-PIU field units, each headed by an Executive Engineer, will function from various designated locations. The KSHIP-PIU would be supported by Independent Engineering Consultants (IEC), which will be a firm of consultants being separately recruited for the purpose.

3. The main objective of the consulting services is to support KSHIP-PIU to implement the project, as required under the ADB loan, by (i) monitoring the implementation of safeguards in accordance with ADB's Safeguard Policy Statement; (ii) assisting KSHIP-PIU in preparing a financial management system, including preparing financial statements; (iii) preparing the monthly and quarterly reports as required for management of the project and reporting to ADB; (iv) provide proper monitoring of the funds available, fund flows within the project, disbursements of funds from the loan account, projections of future financial needs; (v) scheduling the project implementation and establishing project schedules with milestones and critical path analysis based on international best practice; (vi) advise KSHIP-PIU on any potential issues and coordinate within the project or third parties as necessary, and (vii) prepare the reports and documentation needed for the KSHIP-PIU to submit to ADB.

4. The consultancy will be financed from the loan and be carried out by a national consulting firm (Implementation Support Consultants – ISC), recruited in accordance with ADB's Guidelines on the Use of Consultants, March 2013. The consultant will be selected in accordance with ADB's Quality- and- Cost- based selection method (QCBS - full technical proposal) with a quality to cost ratio of 80:20. The ISC would be mobilized along with the IEC.

B. Staffing

5. The consulting services will be implemented from July 2017 to July 2020. The ISC will be based in the office of KSHIP-PIU at Bengaluru, Karnataka. The inputs of national experts required are summarized in table 1 below.

Table 1: Summary of Consulting Services Requirement

Name of Positions (National)	Person-months
Project Management Expert (Team Leader)	36
Financial Management Expert	36
Financial Accounts Expert	36
Reporting and Scheduling Expert	36
Social Development Expert	24
Environmental Expert	36
Total	204

Source: Asian Development Bank.

C. Scope of Works

6. The scope of works for the consulting services provided by the ISC will include, but not be limited, to the following:

7. **Project Management Expert/ Team Leader (national, 36 person-months):** The expert will define the overall parameters for the schedules to be established and identify the information technology (IT) systems to be used for scheduling in the subprojects. The expert will prepare an overall project schedule based on the schedules provided by the contractors, the milestone requirements from the KSHIP-PIU, and the implementation of critical path analysis considering internal and external factors, such as monsoon patterns. The project schedule shall include times required for internal and external approvals, interfaces with and actions required from third parties such as, for example, municipalities, utilities operators, the KPWD and Karnataka Road Development Corporation Limited (KRDCL), times for advance notice for specific actions, etc. The expert will lead the team, check the outputs of the team members for timeliness and quality, and ensure that project actions remain on track and any concerns and issues are brought to the notice of KSHIP-PIU.

8. **Financial Management Expert (national, 36 person-months):** Define the overall reporting process and standards in the project to fulfill the requirements of KSHIP-PIU and ADB by (i) assisting KSHIP-PIU in preparing a financial management system, including preparing financial statements; (ii) preparing the monthly and quarterly reports as required for management of the project and reporting to ADB; (iii) scheduling the project implementation and establishing project schedules with milestones and critical path analysis based on best practice; (iv) advise KSHIP-PIU on any potential issues, including road safety activities, and coordinate within the project or third parties as necessary; (v) provide proper monitoring of the funds available, fund flows within the project, disbursements of funds from the loan account, projections of future financial needs; and (vi) prepare the reports and documentation needed for the KSHIP to submit to ADB. The Expert will also carry out monthly and quarterly monitoring of budget vis-à-vis actuals, analyze variances and support in undertaking corrective actions.

9. In the field of financial management, the Expert will: Prepare a financial management system to consolidate financial data and monitor continuously with the inputs from the Reporting & Scheduling Specialists posted with the KSHIP-PIU of the financial progress of the project. Prepare projections of contract awards and disbursements for the project and continuously update the requirement for financing based on the change orders and contract variations agreed upon in the project. Ensure that the payment certificates of the contractors are processed in a timely manner and organize and monitor the overall process of reimbursement for payments to the contractor for reimbursement by ADB through the necessary process within KSHIP-PIU and

Government of India. Ensure continuous flow of funds and disbursements and timely reimbursement of invoices to reduce the amount of commitment charges paid by the Government.

Financial Accounts Expert (national, 36 person months). Sound financial management is a key for the successful implementation of this project. The accounting will be done by KSHIP-PIU on a cash basis using government systems, and expenditures will be recorded at the time of final payment. The rules of accounting will be guided by PWD Manual, and State Financial Handbook. The field divisions of KSHIP-PIU will maintain accounting records at the respective locations. The objective of the assignment is to provide support to the KSHIP-PIU in discharging finance and accounting functions and assisting them in ensuring that financial rules/practices, fiduciary aspects are appropriately handled at all levels of the project. The Expert will work in close association with accounts staff and engineers of KSHIP-PIU Head office, and field offices (divisions/circles) of KSHIP-PIU/ KPWD. The Expert will assist KSHIP-PIU with the accounts function, including:

- (i) Verify requisition by divisions/circles related to cash credit limit (CCL) and support in timely allotment and transfer of funds.
- (ii) Facilitate project in timely and effective resolution of AG audit observations. Facilitate external project audit by State AG and ensure timely submission of audit report to KPWD and ADB.
- (iii) Follow-up with office of CAAA on ADB disbursements and reconcile claims admitted and disbursed to KSHIP-PIU.
- (iv) Strict monitoring of bank guarantees (i.e. bank confirmations, timely renewals etc.) and insurance policies.
- (v) Undertake sample field review of financial records maintained by project divisions/circles for maintaining financial discipline and report anomalies/deficiencies to management.
- (vi) Verify monthly expenditure statements and financial records submitted by project divisions/circles for completeness and correctness.
- (vii) Carry out review of internal controls, contract terms/conditions followed in processing payments. Support KSHIP-PIU, project divisions/circles in obtaining DDO reconciliation statements and AG expenditure reconciliation certificates.
- (viii) Support KSHIP-PIU and field divisions in compliance to government statutory requirements and tax laws i.e. deduction and timely remittances of taxes etc.

10. **Reporting and Scheduling Expert (national, 36 person-months):** The Reporting and Scheduling Expert will update the individual project schedules for the project, from time to time, with site visits, and will provide inputs to the Financial Management Expert on the timing of funds required. The Reporting and Scheduling Expert will review work programs provided by contractors with respect of issues such as staff and equipment resource constraints, interfaces with third parties and alert KSHIP-PIU on critical actions or approvals required and monitor the overall progress of the project. The Reporting and Scheduling Expert will provide support to the contractors and supervision consultants in establishing and reviewing project schedules and provide training and workshops as needed.

11. General, on Safeguards. ADB's projects strongly support environmental and social safeguards actions in line with ADB's Safeguards Policy Statement (2009) and other policies such as ADB's Public Communications Policy (2011). More specifically, KSHIP-PIU has to meet specific obligations under social safeguards and environmental safeguards. KSHIP-III is classified as 'A' for Social Safeguards and 'B' for Environmental Safeguards. KSHIP-PIU will be implementing and monitoring safeguards action through its field units and headquarters in Bengaluru. In addition, there are specific obligations on the contractors, supervision consultants,

and resettlement NGOs recruited by KSHIP-PIU. The objective of the assignment is to provide support to the KSHIP-PIU in discharging environmental and social safeguards function and assisting them in ensuring that environmental and social safeguards functions, obligations, reporting, and fiduciary aspects are appropriately handled at all levels of the Project.

12. Social Development Expert (national, 24 person-months): The Expert will assist KSHIP-PIU in understanding, monitoring, and reporting on the implementation of resettlement plans (RPs) in accordance with ADB's Safeguard Policy Statement (2009) and other related policies such as the Public Communications Policy (2011). The Expert will ensure that the KSHIP-PIU has undertaken payment of compensation to people affected by the project prior to hand-over of the site to the contractor. The Expert will prepare the due-diligence reports on resettlement implementation as needed under the Project, and provide monthly and quarterly reports on resettlement implementation and provide updates on the schedule and financial aspects of resettlement to the team. The Expert will ensure consultations of affected persons are undertaken and documented during RP implementation and participate in and document the grievance redress mechanism. The Expert will monitor and provide guidance to the work of the supervision consultants and NGOs for resettlement implementation (engaged by KSHIP-PIU) and monitor the resettlement implementation at the project sites and provide training, if required, to the local KSHIP-PIU/ KPWD, and IEC consultant staff.

13. Environment Expert (national, 24 person-months): The Expert will assist the KSHIP-PIU in understanding, monitoring, and reporting on the environmental management plan (EMP) and other measures related to environmental protection in accordance with ADB's Safeguard Policy Statement (2009). The expert will support the PIU-KSHIP in processing statutory clearances such as forestry clearances and Archaeological Survey of India (ASI) clearances and others. The Expert will prepare the due-diligence reports on EMP implementation as needed under the Project and provide monthly and quarterly reports on EMP implementation and provide updates on the schedule and financial aspects to the team. The Expert will monitor EMP implementation at the project sites and support EMPIU to review and endorse environmental monitoring reports prepared by the IEC for submission to ADB. The Expert will also provide training, if required, to the local KSHIP-PIU/ KPWD, IEC staff and relevant contractor's staff.

D. Reporting

14. The consultants will provide the EA and ADB with monthly and quarterly progress reports based on the reports provided by the IEC and contractors, and their own work. The consultant will prepare an Inception Report within 30 days after mobilization and will define the reporting requirements and procedures in this Inception Report. The consultant will prepare other reports as required by KSHIP and ADB.

E. Qualifications for the Experts

Position	Expertise	Minimum Qualification and Professional Experience
Project Management Expert/ Team Leader	Civil Engineering, Project Management	<ul style="list-style-type: none"> • Master's degree in civil engineering, highway engineering, or equivalent • Experience of at least 15 years in project management, and at least five years in team leadership positions for road project contracts • Experience of externally aided projects will be an added advantage.
Financial Management Expert	Finance and Accounting	<ul style="list-style-type: none"> • Bachelor's Degree in Finance & Accounts with at least 8 to 10 years of experience in government accounting and PWD systems. Preference will be given to chartered / cost accountant. • Experience in similar externally aided projects or road infrastructure projects would be an added advantage. • Excellent reading, writing and communication skills. Knowledge of local language (Kannada) will be an advantage. • Fluency in English is required. • Good computer knowledge is required.
Reporting and Scheduling Expert	Project Management	<ul style="list-style-type: none"> • Bachelor's degree in civil engineering, highway engineering, or equivalent. • Experience of at least 10 years in project management activities for civil engineering projects. Roads and highways experience will be given higher weight. • Should have knowledge of project management software.
Financial Accounts Expert	Accounting and Taxation	<ul style="list-style-type: none"> • Bachelor's Degree in finance & accounts, CA (Inter) or ICWA (Inter) with at least 3 to 5 years of experience in accounting. • Excellent reading, writing, and verbal communication skills. Knowledge of local language (Kannada) will be an advantage. • Fair knowledge of English is required. • Working knowledge of computer and accounting software is required.
Social Development Expert	Social Safeguards	<ul style="list-style-type: none"> • Master's Degree or equivalent in social sciences or related field • Minimum total work experience after post-graduation – 15 years • Minimum Social/ resettlement expert in at least two externally funded (World Bank or ADB) projects of similar size and complexity. • The candidate must have knowledge of the Asian Development Bank's guidelines, procedures and operational policies/directives. • Experience in preparation and monitoring of Resettlement Plans, gender plan, LAP, community consultations and IPDP is required. • Familiarity with project area and local language will be

Position	Expertise	Minimum Qualification and Professional Experience
		advantageous
Environment Expert	Environmental Safeguards	<ul style="list-style-type: none"> • Master's Degree or equivalent in environment sciences or related field • Minimum total work experience after post-graduation – 15 years • Minimum 10 years of total work experience on carrying out environment impact assessments of road development projects • Desirable - Environmental Expert in at least two externally funded (World Bank or ADB) projects • The candidate must have good knowledge of the Asian Development Bank's guidelines, procedures and operational policies/directives. • Candidate should be conversant with all the activities expected to be undertaken for environmental / forest / wild life clearance procedures and pertinent guidelines of Ministry of Environment & forests (MoEF), Government of India. • The candidate must have the experience of preparing environmental management plans and supervising & monitoring implementation of the plans.

F. Cost Estimates

Table 2: Abstract Cost Estimates
(\$'000)

Item	Total Cost
1. Consultants	
a. Remuneration and per diem National consultants (204 person-months)	1,632.0
b. Local travel	50.0
c. Reports and communications	25.0
2. Equipment	25.0
3. Training, seminars, and conferences	25.0
4. Miscellaneous administration and support costs	50.0
5. Office accommodation and transport	Provided by KSHIP
6. Contingencies	103.0
Total	2,000.0

Source: Asian Development Bank estimates.