

**Completion Report**  
**Training Programme on Feasibility Study and Preparation of Detailed Project**  
**Report (DPR) for Highway Projects for highway professionals from**  
**Mekong-Ganga Cooperation (MGC) countries**  
**sponsored by Ministry of External Affairs (MEA), Govt. of India**  
**organized by IAHE from 25 Sept, 2023 to 7 Oct, 2023 at IAHE, India**

## **1. Background**

Indian Academy of Highway Engineers (IAHE) is an apex institute of excellence for training of highway professionals established by the Ministry of Road Transport & Highways, Government of India in Jan, 1983 and effectively building capacity of highway professionals to meet the demand of the road sector since last 40 years. The Hon'ble Minister is the President and Secretary, Road Transport & Highways is the Vice-President of the Society. The Society is advised by a Governing Body comprising eminent and distinguished Engineers and Administrators of the country. Secretary, Ministry of Road Transport and Highways is the Chairman of this Governing Body.

IAHE has its own green sprawling campus developed on 10 acres of land at A-5, Sector-62, Meerut Expressway, NOIDA (UP). The campus has the state-of-the-art training infrastructure viz. auditorium, conference hall, seminar hall, lecture halls, computer laboratory, material testing laboratory, library, trainee's hostel, dining/catering facilities, recreational facilities with sports (indoor/outdoor) facilities, supported with staff quarters, etc. The hostel rooms are well furnished and equipped with personal toilets, LED TV with DTH and Wi-Fi net access facilities for comfortable living and learning. The campus is fully developed, functional and the best place for training of highway professionals in India.

IAHE has organized (till 31 March, 2023) 1689 training programmes for 46,792 highway professionals including 1948 international participants from 55 Afro-Asian countries participated. It has exclusively organized 28 programmes for 623 African engineers from 45 countries during 2010-2019 under MEA sponsored IAFS scheme. Exclusively developed training modules are delivered as per the requirements by eminent experts of IAHE including guest experts invited from public and private sectors engaged in highway sector. IAHE is successfully serving its primary objective of training of highway professionals since last 40 years.

## 2. Proposal

The experience gained while implementing gigantic road development programmes at Central and Provincial level under the Bharatmala Pariyojna, National Highway Development Projects (NHDP) and Pradhan Mantri Gramin Sadak Yojana (PMGSY) schemes have been shared with highway professional from MGC countries for further improving their road network. IAHE would be delighted to further impart training of highway professionals from MGC countries in the field of highway engineering and construction (roads and bridges) as mentioned by the Joint Secretary (Transport), MoRTH during the inter-ministerial meeting held on 29<sup>th</sup> March, 2019 in MEA. It was proposed to organize (short duration training) covering various aspects of highways i.e. planning, design, construction, quality assurance and supervision, operation, maintenance, project management, procurement, contract management, IT applications, road safety engineering and audit, etc., Keeping in view the experience, following two training programmes were proposed for highway professionals of MGC countries at IAHE during current financial year:

- (i) Feasibility Study and Preparation of Detailed Project Report (DPR) for Highway Projects
- (ii) Construction and Maintenance of Highways (Roads and Bridges)

Detailed program contents, delivery schedule, objectives, qualification and experience requirements, etc. with detailed estimate for organizing the same at IAHE was submitted to MEA under the subject 'Implementation of projects and joint activities under MGC – India Plan of Action (2019-22 proposed to be extended upto 2025)' vide IAHE F.No. IAHE/Trg/7/MGC-MEA/2019-20 dated 9th April, 2019.

MEA decided to organize only one programme on Feasibility Study and Preparation of Detailed Project Report (DPR) for Highway Projects for 25 highway professionals from five (5) Mekong-Ganga Cooperation (MGC) countries (Cambodia, Laos, Vietnam, Myanmar and Thailand) in Aug-Sept-Oct, 2023 and requested to revise the cost estimate. Accordingly, a revised proposal amounting to INR 23,48,100 was submitted to MEA on 3 May, 2023 for organizing a programme for 25 participants from 25th Sept, 2023 to 7th Oct, 2023 by IAHE at Noida (UP). Further, MEA intimated that participants from Thailand may not be coming as such revised estimate amounting to INR 19,06,800 was submitted for approval. The nominations of 20 participants were invited by respective High Commissions of

India and forwarded to IAHE by the MEA HQ (**Annex-1**). MEA conveyed Sanction Order vide No.IDP/244/001/75/2022(2090) dated 26 Sept, 2023 amounting to INR 19,06,800 for organising the programme for 20 participants from 4 MGC countries from 25<sup>th</sup> Sept, 2023 to 7<sup>th</sup> Oct, 2023 by IAHE, Noida (UP), India (**Annex-2**). The programme has been successfully organised for 20 participants from 5 MGC countries viz. Cambodia, Laos, Myanmar and Vietnam.

### **3. Objective**

The main objective of the training programme was to share Indian experience of Preparation of DPR for highway projects so that excellent quality of DPR is prepared to minimize time overrun, cost overrun, change of scope, variations, disputes and arbitration for highway development endeavours. Apart from sharing Indian experience of DPR preparation, state-of-the-art highway and expressway projects were shown to demonstrate the same at site including interactions with various implementing agencies and stakeholders. To achieve the objective, a detailed schedule was planned in such a way by disseminating Indian codes, guidelines, manuals, standards, execution methodology of highway development were discussed in the classroom and practical aspects were shown at site. Course schedule is attached at **Annex-3**.

### **4. Training Delivery**

Twenty (20) participants, 5 each from Cambodia, Laos, Myanmar and Vietnam, successfully attended the training programme. All the participants were received by IAHE at New Delhi international airport as per their itinerary and taken to IAHE campus where all necessary lodging and boarding arrangements were made. The list of participants registered on 25<sup>th</sup> Sept, 2023 in the program is available at **Annex-4**. The program was inaugurated by the Director, IAHE.

As per the sanctioned provisions, all the participants were paid Living Allowance amounting to INR 21,000 per participant (@1500/day for 14 days duration) (**Annex-5**). Relevant Indian codes, manuals and guidelines were also provided under Book Allowance provision of the estimate. List of books provided is attached at **Annex-6**.

During the program, faculty/experts shared their experiences on policy issues, planning, design, construction, maintenance & management highway infrastructure including highway tunnels & expressways, pre-construction activities (LA & clearances), road safety engineering & audit, ICT applications, new technologies & materials, various models of highway development, economic and financial appraisal, quality assurance, road safety issues, etc. and comprehensively disseminated Indian practices with the participants. A few photographs of the programme are attached at **Annex-7** for ready reference.

## **5. Evaluation and Feedback**

Evaluation of the participants was done through discussions on the last day. Director, IAHE, Joint Director, IAHE, Senior Officers of MEA and a subject expert was invited during the evaluation and feedback. Participants suggested that duration of the programme be increased and more field visits to various highway projects be incorporated and such type of programs of longer duration should be frequently organised. Summary and suggestions given by the participants are available at **Annex-8**.

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**भारतीय राजमार्ग अभियन्ता अकादमी**  
(सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार)  
**Indian Academy of Highway Engineers**  
(Ministry of Road Transport and Highways, Govt. of India)

## Training Programme on Feasibility Study and Preparation of Detailed Project Report (DPR) for Highway Projects

for the officers of Mekong-Ganga Cooperation (MGC) Countries  
sponsored by

**Ministry of External Affairs, Govt. of India**

25 Sept to 7 Oct, 2023 by IAHE at Noida, India

25.09.2023 (Monday)		
Time	Topic	Faculty
09.30-10:00	Registration	
10:00-10:30	Opening Ceremony and Introduction	Mr. Sanjeev Kumar Director, IAHE and Mr. Dinesh Sharma Joint Director, IAHE
10:30-11:15	Overview of the course and its objectives, Introduction and Familiarizing, Formation of groups	
11.30-13.00	Road Development Scenario in India - An overview	
14.00-17.15	<b>Overview of FS &amp; DPR preparation and RFP for DPR Preparation</b> <ul style="list-style-type: none"> <li>❖ Scope</li> <li>❖ Key Personnel in DPR Consultancy Team</li> <li>❖ Selection of roads, Core network and Public/community consultation</li> <li>❖ Stages in Pre-feasibility/feasibility activities</li> <li>❖ Finalization of alignment Project Preparation</li> <li>❖ Activities in DPR Preparation</li> <li>❖ Client's role and supervision in preparation of DPR</li> <li>❖ Feasibility Study, Preparation of DPRs (New Road and Widening),</li> </ul>	Mr. MS Rawat ED, AECOM
26.09.2023 (Tuesday)		
09:45-13:00	<b>Modern Topography Survey and Data Collection Techniques using LiDAR/Drone, DGPS, Total Station, GIS/GPS applications and Fixing the alignment</b> <ul style="list-style-type: none"> <li>➤ Scope of Surveying in Highway Project</li> <li>➤ Accuracy</li> <li>➤ DGPS Survey, Total Station and Auto Level application</li> <li>➤ Introduction to LiDAR, Drone Photogrammetry</li> <li>➤ Data collection and processing</li> <li>➤ Demo. of case study and hands-on</li> </ul>	Mr. Amit Sharma Director MatrixGeo
14:00-17:15	<b>Traffic Studies for Preparation of DPR (Road and Bridge Designs)</b> Traffic Studies, Traffic demand estimation and forecasting, Traffic Volume, Turning Movement, OD, Cargo/Commodity Movements, Axle Load Surveys, Speed & Delay, NMTs, Logistic Park Terminals, Traffic demand estimation/growth rate assessment, population growth rate, elasticity of transport demand, socio-economic development plan, land use studies, Diverted/Generated/Induced Traffic, Level of Service, etc.	Mr. D. Sanyal MD, CRAPHTS Consultants (I) Pvt. Ltd

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27.09.2023 (Wednesday)		
09.45-13.00	<b>Geometric Design of Highways and Use of MX/Open-Roads Software</b> Applicable design standards, Cross Sectional Components, Lane, Shoulders, Median, Kerb, Slope of Embankment, Service Road, Drain, Footpath, Cross Fall, Developing Typical Cross Sections for Rural/Built UP/Plain/Hilly Sections & Approaches to Bridge Structures, Terrain, Design Speed, Sight Distance, Elements of Horizontal Curve, Design of Horizontal Curve, Permissible Vertical Gradient, Design of Vertical Curve and computer applications	<b>Mr. Sandeep Sachdeva</b> <b>GM, SMEC</b>
14.00-17.15	<b>Computer Aided Highway Design</b> MX Software, Design features, generation of DTM, Demo. of highway design case study, hands on practice for design of horizontal & vertical alignment design (Plan & Profile) starting from data input of survey data to final generation of Plan & Profile, design checks, computation of quantities and preparation of estimates (BoQ)	
28.09.2023 (Thursday) <span style="float:right">Gazatted Holiday</span>		
09.45-11.15	<b>Preconstruction activities &amp; Clearances (LA &amp; Shifting of Utilities)</b> ❖ Guiding Principles for Land Acquisition ❖ Preparation of Land Plan, Schedule and Draft Notifications under RFCTLARR and Shifting of utilities and preparation of estimates	<b>Mr. VK Sharma</b> <b>Former CGM (Env), NHAI</b>
11.30-13.00	<b>Environmental and Social issues and Project Clearances</b> ❖ ESMF, Environmental and Social Impact Assessment Study, Preparation of Environmental Management Plan and Integration of R&R with DPR ❖ Legal Framework and Clearances, Guidelines for Environmental, Wild Life & CRZ Clearance, Guidelines for Forest Land Diversion ❖ Social screening, PAP, R&R plan, Compensation & Road safety issues	
14.00-17.15	<b>Pavement Condition Survey, Material Survey, Geo Technical Investigations</b> Pavement composition & Condition (Cracking, Rutting, Ravelling, Pothole, Edge Breaking etc.), Shoulder Condition, Pavement Roughness- BI & IRI, Structural Evaluation FWD Test, Subgrade Characteristics & Strength, Borrow area selection based on soil properties, quantity & availability and clearance issues, Identification of Quarry for sand & stone based on material properties, quantity availability and clearance issues, use of alternative materials viz. flyash, slag, recycled materials & waste materials, Bituminous mix design and concrete mix design, Geo Technical Investigations & Sub-Soil Exploration and materials survey	<b>Mr. Rajiv Bhatnagar</b> <b>Highway Design Expert</b>
29.09.2023 (Friday)		
09:45-11:15	<b>Hydraulic &amp; Hydrological Investigations &amp; Studies</b>  Hydrological studies, Topography, River & Catchment Area studies, Storm & Rainfall Characteristics, Vegetation and deposits, Collection of LWL, HFL, LTL, HTL, observed maximum depth of scour, history of hydraulic functioning of existing bridge, Flood Discharge, Area Velocity Method, Unit Hydrograph Method, Linear Waterway, HFL, Afflux, Scour depth and Model Study	<b>Mr. V Karthik</b> <b>Bridge Design Expert</b> <b>Jacobs</b>

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11.30-17:15	<b>General Guidelines for Bridge Design</b> ❖ Siting of Bridges and GAD ❖ Overview of Design of Foundations (Pile and Well) and Substructures ❖ Design Principles of different components such as Foundation, Substructures, different types of Superstructures, Bearing etc. ❖ Types of Bridges and Bridge Components, Bridge Siting, Decision on Span arrangement and Preparation of GAD ❖ Bridge Loading, Material Characteristics & design values, Function & Behaviour of different components under different loadings	<b>Mr. V Karthik</b> <b>Bridge Design</b> <b>Expert</b> <b>Jacobs</b>
<b>30.09.2023 (Saturday)</b>		
08:00-21:00	<b>Departure for field visits</b> Greater Noida and Yamuna Expressway and road safety features, Visit to Toll Operation & Traffic Management Center at Jewar Toll Plaza, Visit on Agra-Lucknow & Agra Ring Road Interchange, Visits to various historical places in-and-around Agra, Visit to The Taj Mahal Monument and Agra Fort	<b>Mr. Dinesh Sharma</b> <b>Joint Director, IAHE</b>
<b>01.10.2023 (Sunday)    </b>		

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14.00-17.15	Quality Assurance, TQM and QC systems, Materials Specifications, Acceptance Criteria, Significance of various QC Tests for Soils, Aggregates and Bituminous materials, Bituminous Mixes and Mix Design for Bituminous Construction, New Materials and Technology (HiMA/SMA) and Demonstration of various QC tests in the IAHE material testing laboratory	Mr. Satander Kumar, Former Chief Scientist, CRRI
17.15-18.30	Quality Assurance, TQM and QC systems, Materials Specifications, Acceptance Criteria, Significance of various QC Tests for Cement and Concrete Materials, Concrete Mix Design, Admixtures, Curing Compound, New Materials and Technology (FRP bars and CRCP Ultra-High Performance and Fiber Reinforced Concrete) and Demonstration of various QC tests in the IAHE material testing laboratory	
05.10.2023 (Thursday)		
09:45-11:15	Planning and Design of Hill Roads	Prof. RK Bhandari Eminent Hill Road Expert, Advisor NDMA
11:30-13:00	Design of High Embankment and RE Walls	
14:00-17:15	<b>Project Costing, Economic and Financial Analysis</b> ❖ Quantity Calculation, Rate Analysis and Cost Estimation ❖ Objective of Economic and Financial Analysis ❖ Economic Analysis using HDM-IV / Project Evaluation (EIRR, FIRR) ❖ Financial Analysis, Financial structuring and Modelling	Mr. RC Aggarwal Financial Advisor NHAI
06.10.2023 (Friday)		
09:45-13:00	<b>Road Safety Engineering Measures in Planning and Design</b> ❖ Safe System Approach ❖ Elements & Design Principles of At-Grade Intersections and Grade Separated Intersections ❖ Road Safety Engineering Measures- Road Signs, Road Markings, Delineators, RPM, Crash Barriers, Traffic Calming Measures etc. ❖ Bus Bays, Truck Lay Bye. Highway Lighting, Way Side Amenities	Mr. D. Sanyal, MD, CRAPHTS Consultants
14:00-17:15	Introduction different models of contracts viz. Item rate / PPP / EPC / HAM and adoption of the particular model for taking up the projects	Mr. Sanjeev Kumar Director, IAHE
07.10.2023 (Saturday)		
09:45-13:00	Overview of DPR Preparation, Scrutiny of DPRs, BOQ and Estimates, Proof checking of Designs/Drawings, Checklist for DPRs & Estimates, approval process, DPRs & Estimates for Repair & Rehabilitation Works and Preparation of Bid Documents for Bidding Process	Mr. Anupam Gupta, Executive Director, LASA
14:00-15:30	Group Presentations by the participants, Feedback, Concluding session and Distribution of Certificates to the participants (Shri Sanjeev Kumar, Director, IAHE and Shri Dinesh Sharma, JD, IAHE)	
11.15 – 11.30 Tea break		13:00-14:00 Lunch break
		15.30-15.45 Tea break

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A few photographs of the programme



Group photo of the participants with Shri Sanjeev Kumar, Director, IAHE

## Opening Ceremony of the programme at Seminar Hall, IAHE





Pictures during the training programme



Pictures during the training programme



Visits on Noida Expressway and Yamuna Expressway (enroute to Taj Mahal) – 1<sup>st</sup> visit





Visit to the Taj Mahal as part of cultural exchange exposure to MGC participants – 1<sup>st</sup> visit





Visit to Bharat Mandapam (G20 Venue) as part of cultural exchange exposure – 2<sup>nd</sup> visit



Visit to Mahatma Gandhi Memorial, Raj Ghat on 2<sup>nd</sup> Oct, 2023 as part of cultural exchange exposure – 2<sup>nd</sup> visit



भारतीय राजमार्ग अभियन्ता अकादमी

Participation in the cleanliness drive with Director, IAHE at IAHE campus on 1<sup>st</sup> Oct, 2023



**Group presentations and evaluation of the participants on the concluding day**



**Distribution of certificates on the concluding day**