उत्तर प्रदेश UTTAR PRADESH DE 588054

MEMORANDUM OF UNDERSTANDING

THIS BIPARTITE MEMORANDUM OF UNDERSTANDING (MoU) is made this 27th day of February 2018.

BY AND BETWEEN

INDIAN INSTITUTE OF TECHNOLOGY (BANARAS HINDU UNIVERSITY), VARANASI

AND

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE, ROORKEE

Indian Institute of Technology (Banaras Hindu University), Varanasi, Uttar Pradesh, registered as IIT (BHU) and Indian Institute of Technology Roorkee, Roorkee, Uttarakhand registered as IIT Roorkee hereby agree to establish a program on research cooperation through MoU for steering the IMPRINT India Project for which funds are being received from IMPRINT Nodal Office/IMPRINT Cell at IIT Kanpur.

IIT (BHU) and IIT Roorkee are collectively referred to as "The Parties".

1. Objective: This MoU is made to promote cooperation in research for both the parties for implementation of the IMPRINT Project-4583 entitled "Propagation and Mitigation Model of Mixed Traffic Noise for Planning of Mid-Sized Indian Cities". The Principal Investigator of the project is Dr. Brind Kumar, Department of Civil Engineering, IIT-BHU and the Co-Investigator is Prof. Manoranjan Parida, Department of Civil Engineering, IIT Roorkee. The technical details of the objectives and deliverables are mentioned in the annexed statement of distribution of work and finances.

2. Duration of the agreement: This MoU will be valid for three years after signing by both the parties and till the completion of the research project.

3. Funding: The research project shall be financially supported by the IMPRINT Nodal Office/IMPRINT Cell at IIT Kanpur comprising of contributions from the Ministry of Human Resource Development (MHRD) and the Ministry of Urban Development (MoUD), Govt. of India.

4. Distribution of work and finances: The distribution of work and finances shall be as per the annexed statement to this effect arrived between the PI and Co-PI. The participating Institutions of the research project shall facilitate expeditiously the needed support to the researchers so as to enable them to attain the deliverables within the time frame affixed for the project. A copy of the MoU shall be made available to the IMPRINT Nodal Office/IMPRINT Cell at IIT Kanpur for their approval for further steering of the project according to this MoU within the sanctioned grants.

5. Implementation: The parties hereby agree to execute the part of the research work assigned to their expertise as per the annexed statement of distribution of work and finances. Progress reports needed by the IMPRINT Cell at IIT Kanpur shall be prepared by joint consent of both PIs. Consolidated data shall be maintained at the Nodal Project Office to be established at IIT (BHU) out of the contingency funds. Engagement of 2 Nos. extra manpower for field data collection shall be met out of travel grant; while engagement of 1 No. non-technical office staff cum accountant cum multi-tasker at Nodal Project Office shall be met out of the contingency funds. Transfer of funds from IIT (BHU) to IIT Roorkee shall be affected upon by IIT (BHU) on receipt of funds for the respective year. Institute share shall be transferred as and when funds for the same are received at IIT (BHU).

6. Patents/Publications: Any publication resulting from the research work under this project will offer authorship to the Principal Investigator and Co-investigator of the project along with the other personnel involved in execution of the work. Intellectual Property (IP) sharing in case of patents, technology transfers should be done according to the IPR policies of the participating Institutions.

7. Confidentiality: Both parties hereby agree to abide by the rules of confidentiality for all information/ data and intellectual properties. "Confidential Information" shall mean all data, technical know-how, trade secrets and other information related to the TECHNOLOGY(IES) disclosed or provided by the parties. Disclosure of data to any third party should only be done with mutual consent of both the parties.

8. Arbitration: If any dispute or difference arises between the parties hereto as to the construction, interpretation, effect and implication of any provision of this agreement including the rights and/or liabilities or any claim or demand of any party against other or in regard to any other matter under these presents but excluding any matters, decisions or determination of which is expressly provided for in this agreement, such disputes or differences shall be referred to a sole arbitrator mutually appointed by the parties.

The following terms shall be applicable in case of Arbitration:

(i) The venue of the Arbitration shall be Varanasi.

(ii) Each party shall bear and pay its own cost of the arbitration proceedings, unless the Arbitrator otherwise decides in the Award.

(iii) The courts in Varanasi shall have jurisdiction in all matters concerning this agreement, including any matter arising out of the Arbitration Proceedings or any Award made therein.

IN WITNESS WHEREOF IIT (BHU) and IIT Roorkee have executed these presents the day and year first above written.

For and on behalf of the IIT (BHU)

Rajiv Rakesh

(Dean, Research and Development)
अधिष्ठाता (अनुसंधान एवं विकास)
Dean (Research & Development)
भारतीय प्रौद्योगिकी संस्थान (का.हि.वि.)
Indian Institute of Technology (B.H.U.)
वाराणसी/Varanasi-221005

In the presence of

1. ----------
विभागाध्यक्ष/HEAD
जानपद अभियांत्रिकी विभाग
Civil Engineering Department
भारतीय प्रौद्योगिकी संस्थान/Indian Institute of Technology
(काशी हिन्दू विश्वविद्यालय)/(Banaras Hindu University)
वाराणसी/Varanasi-221005

2. ----------

Dr. Brind Kumar
Principal Investigator
MHRD IMPRINT Project
(R&D/MHRD/Civil/17-18/01)
(MHRD Code: 4583)
Department of Civil Engineering
IIT (BHU), Varanasi-221005

For and on behalf of IIT Roorkee

Pkumar

(Dean, Sponsored Research and Industrial Consultancy)
Dean
Sponsored Research & Industrial Consultancy
Indian Institute of Technology Roorkee
Roorkee-247667 (INDIA)

In the presence of

1. ----------
उप.कुलसचिव (लेखा)
Dy. Registrar (A/c)
प्रायोजित शोध एवं औद्योगिक परामर्श
Sponsored Research & Ind. Consultancy
भा. प्रौ. सं. रुड़की/I.I.T. Roorkee-247667

2. ----------

STATEMENT FOR DISTRIBUTION OF WORK AND FINANCES FOR THE IMPLEMENTATION OF IMPRINT INDIA PROJECT "PROPAGATION AND MITIGATION MODEL OF MIXED TRAFFIC NOISE FOR PLANNING OF MID-SIZED INDIAN CITIES"

1. Project Code: (i) MHRD: 4583.
(ii) IIT(BHU): R&D/MHRD/Civil/17-18/01.

2. Investigators:

Principal Investigator (PI):	Dr. Brind Kumar, Dept. of Civil Engg., IIT (BHU), Varanasi.
Co-Principal Investigator (Co-PI):	Prof. Manoranjan Parida, Dept. of Civil Engg., IIT Roorkee, Roorkee.

3. Selected mid-sized cities for study: Kanpur, Gorakhpur and Varanasi in Uttar Pradesh.

4. Objectives: To make assessment of road traffic noise propagation; plotting of horizontal and vertical profile of noise signature; survey of community response; and analysis of data for model development for three Indian mid-sized cities of Kanpur, Varanasi and Gorakhpur having similar traffic & geophysical conditions and noise enviroscape with a view to propose suggestions for noise mitigation in urban planning.

5. Deliverables: The deliverables include development of road traffic noise propagation and mitigation model on the horizontal and vertical scale for mixed traffic operation in three mid-sized cities of Kanpur, Varanasi and Gorakhpur having similar geophysical road transport apparatus and noise enviroscape. These models shall be used by town planners to decide location of various landuse in mid-sized Indian cities for safety from traffic noise.

Models developed in the past with low volume data till 2004 shall be judged for their efficacy. Traffic monitoring studies are time consuming and need adequate resources. Unlike western countries, no efforts were funded in the past for enquiring into road traffic noise pollution due to vehicular operation under mixed traffic flow conditions. Knowledge is available from the experiences of the western world, other developing economies and few studies conducted in India.

After analysis of field data, this knowledge can be translated to our context for development of road traffic noise propagation and mitigation model which is overdue for mid-sized Indian cities. It will also aid EIA and help developing an effective management plan for vehicular road traffic noise pollution.

6. Work distribution:

Kanpur:	IIT Roorkee, Roorkee.
Gorakhpur and Varanasi:	IIT (BHU), Varanasi.

7. Manpower requirement for field data collection:

Kanpur	1- Ph.D. scholar + 1- helper + 2-hired field worker.
Gorakhpur	1- Ph.D. scholar + 1- helper + 2-hired field worker.
Varanasi	1- Ph.D. scholar + 1- helper + 2-hired field worker.

Contd. P/2

8. Supervisor & Co-Supervisor for the research: For the study area of Kanpur, the Supervisor shall be Prof. Manoranjan Parida and the Co-Supervisor shall be Dr. Brind Kumar. For the study area of Gorakhpur and Varanasi, the Supervisor shall be Dr. Brind Kumar and Co-Supervisor shall be Prof. Manoranjan Parida.

9 Nodal project office:

At IIT (BHU) with: 1- Technical staff (Data Entry/3D Digital Studio Operator), and
1- Non-technical office staff cum Accountant or Multi-tasker.

10. Purchase of equipment, software etc. and holding of meetings, conference/seminar etc.:

To be done at IIT (BHU) Nodal Project Office.

11. Time-Activity framework:

0-3 months – (*preliminary phase*)	(i) Upon approval of the project, procurement of equipment, software etc.; fabrication of hoist; and hiring/training of personnel's, establishment of office etc. will be done. (ii) Meeting with resource persons. (iii) Finalization of data collection sites.
4-27 months – (*data collection phase*)	(i) Data collection for sound level, traffic volume and composition, traffic speed, temperature, relative humidity for acceleration and deceleration lanes. (ii) Inter traffic and intra-traffic interaction during buildup of jam particularly for 2-wheelers and 3-wheelers. (iii) Data on subjective response. (iv) Data on attenuation. (v) Seminar – 1 No. (vi) Conference – 1 No.
28-36 months – (*analysis of data and closure of project phase*)	(i) Analysis of data, model development, validation and comparison of the model. (ii) Framing of recommendations & submission of report. (iii) Workshop – 1 No.

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Consumables- Stationary	0.75	2.25	3.00	
Telecommunication	0.25	0.75	1.00	4.00
Contingency	1.875	5.625	7.50	
- 1- Non-technical office staff cum Accountant or Multi-tasker		1.50	1.50	9.00
Travel and Field Study -				
Ph.D. Scholar and Helper (Kanpur)	5.40	-	5.40	
Ph.D. Scholar and Helper (Gorakhpur)	-	5.40	5.40	
Ph.D. Scholar and Helper (Varanasi)	-	3.60	3.60	
PI & Co-PI	0.90	0.90	1.80	
Hiring of 2 Nos. manpower at site	2.00	4.00	6.00	22.20
Meeting, Conferences, Software etc.	-	7.50	7.50	7.50
Overheads	@20% excluding contingency	@20% excluding contingency	52.00	52.00
Total	16.251 excluding overheads	43.377 excluding overheads	59.628 excluding overheads	59.628 excluding overheads

Note:

1. Funds released by the funding agency are subject to appropriate adjustments during the financial year, and therefore, the above distribution may undergo minor variations during the course of progress of the Project.
2. Funds for the 1st year may be transferred to the Registrar, IIT Roorkee, Roorkee and on the receipt funds for the 2nd year, the same may also be transferred. Adjustment if any, may be affected in the 3rd year. Apportioned overheads of IIT Roorkee may be transferred in the 3rd year after receipt of funds.
3. Any additional fund requirement by either Institutes during the course of the Project execution may be affected upon by the joint recommendation of the PI and the Co-PI.

17. Project progress report submission:

The funding agency requires uploading of progress in terms of technical and financial update/progress on the IMPRINT website by 5th of the subsequent month. This shall be done from the Nodal office at Varanasi. The data from IIT Roorkee side shall be provided by the Co-PI up to 2nd of the subsequent month.

Contd. P/6

18. Thesis Work and Publication:

Both PI and Co-PIs can use the data collected in this Project for Ph. D. / M. Tech Thesis work. All research publications involving the data of the project shall have both PI and Co- PIs as co-authors.

19. Patent:

Any patent developed out of the project shall be jointly owned by IIT(BHU) and IIT Roorkee.

20. Any other matter:

Any other matter arising during the course of execution of the Project shall be dealt in accordance with the joint recommendation of the PI and Co-PI.

Prof. Manoranjan Parida
Civil Engg., IIT Roorkee, Roorkee

Dr. Brind Kumar
Civil Engg., IIT (BHU), Varanasi

Dr. Brind Kumar
Principal Investigator
MHRD IMPRINT Project
(R&D/MHRD/Civil/17-18/01)
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