

Name: Dr. PRADEEP KUMAR



Designation: Senior Principal Scientist/Scientist 'F'

Education: M. Sc. Physics-CCSU
M.Phil. Instrumentation-University of Roorkee, Roorkee,
Ph.D. (Pavement Surface Condition Evaluation and Classification Using Geospatial Tools)-Civil Engineering Department (Geomatics Group), Indian Institute of Technology Roorkee

Contact Details: **Head, Pavement Evaluation Division**
CSIR-Central Road Research Institute (CRRI),
Delhi-Mathura Road, P.O. CRRI, New Delhi –110 025, India

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Area of Specialization: Pavement Evaluation and Geospatial Techniques

Area of Expertise/Work:

- Non Destructive Test Techniques for Pavement Evaluation
 - Profilometric and Response Type Roughness Measurement System
 - Automated Road Survey System / Network Survey Vehicle
 - Falling Weight Deflectometer
 - Weigh-In-Motion
 - Ground Penetrating Radar
 - Continuous Friction Measurement System
- Pavement Management Systems (Roads and Runways)
 - Highway Development and Management Tool (HDM-4)
 - PAVER for Airfield Pavement Management
- Geospatial Techniques for Pavement Evaluation

Training Received (India):

- Computer Operations in BASIC Programming from 12.07.1989 to 18.10.1989 at K. L. Polytechnic, Roorkee, Roorkee.
- C and C++ programming from 28.10.1996 to 23.11.1996 at Indian Institute of Technology (IIT), Delhi
- HDM-4 Software from 04 to 17 Oct, 2006 at CRRI, New Delhi
- Calibration, Maintenance & Usage of the ARRB Hawkeye 2000 Series Laser Profiler & Video Acquisition System, December 2006 at CRRI, New Delhi
- GIS Application in Planning and Management of Rural Road Network 17 to 23 Jan, 2007 at CSIR-CRRI, New Delhi
- Geographical Information System from 26.12.2007 to 25.01.2008 at GIS Institute, Noida
- Training on Arc GIS Software from 09 to 13 Nov, 2009 at ESRI India, New Delhi
- Workshop-Cum-Road Safety Audit Training from 13 to 14 Jan, 2011 at CRRI, New Delhi
- Soft Computing Techniques for Optimization from 03-09 Mar, 2013 at AV-IIITM, Gwalior (Sponsored by DST)

Official Visit Abroad:

- Training on Hawkeye Network Survey System from 08 to 16 Sept, 2008 at Australian Road Research Board (ARRB) Head Office in **Melbourne, Australia**
- Training on Vehicle Mounted Road Condition Monitoring System – Operation, Data Analysis, Troubleshooting and System Validation from 27.09.2010 to 08.10.2010 Australian Road Research Board (ARRB) Head Office in **Melbourne, Australia**
- Attended and Presented Paper in 24th ARRB Conference 2010 held at Melbourne, Australia from 12 to 15 Oct, 2010

Membership of Professional Bodies:

1. Indian Roads Congress – Life Member (e-LM100731)
2. Instrument Society of India, Indian Institute of Science, Bangalore – Life Member (LM-925, 10.06.2000)
3. Indian Society of Remote Sensing, Dehradun-Life Member (L-4100, 01.01.2013)
4. Geotechnical Society of India- Life Member (LM-1169, 23.03.2018)
5. Alumni Association-University of Roorkee, Roorkee (LM-10258)
6. American Society of Civil Engineers (ASCE memberID#10011198)

7. Membership in organizational/ national / international committees:

Organizational Committee:

- Chairman CRRI Welfare Committee
- Chairman CRRI Resident Welfare Committee
- Member, CRRI Asset Management Implementation Committee
- Member, Committee for evaluation of proposals sponsored by industry related to development of products/process
- DAC Member of AcSIR

National Committee:

- Member of the technical committee constituted for inclusion of new weights and measures (weighing in motion road weighbridges) in the Legal Metrology (General) Rules, 2011, Ministry of Consumer Affairs, Food & Public Distribution, Government of India.
- Co-opted Member in Road Maintenance and Asset Management Committee for 2015-2017, Indian Roads Congress, New Delhi
- Invitee in Road Asset Management System (RAMS) Facilitation Committee, Ministry of Road Transport and Highways, Government of India.
- Invitee for the development of Code of Practice for Maintenance of Bituminous Road Surfaces, IRC 82-2015 document.
- Member of H-6 Committee: Road Maintenance and Asset Management Committee for 2018-2020 (3 years), Indian Roads Congress, New Delhi -Major contribution made for :
 - **“Guidelines on Measuring Road Roughness and Norms”, SP-16: 2019 (third revision)**
 - **“Code of Practice for Maintenance of Bituminous Road Surfaces”, IRC 82-2015 (first revision)**

Major Projects Completed/Ongoing:

(M-Member, TL-Team Leader, PL-Project Leader)

1. Development of a Model Highway. (M)
2. Development of Road Survey System for the Measurement of Road Geometrics and Surface Characteristics. (TL)
3. Evaluation of Delhi Roads for Maintenance & Rehabilitation Strategies. (M)
4. Evaluation of Pavement and Database Development for Selected Road Network of Mizoram State. (TL)
5. Assessment of Pavement Surface Condition of Golden Quadrilateral Road Network under NHDP. (TL)
6. Assessment of Riding Quality of Core Road Network in the State of Uttar Pradesh. (TL)
7. Determination of Pavement Classification Number of the Runways at Indira Gandhi International Airport, New Delhi using Falling Weight Deflectometer. (M)
8. Determination of Pavement Classification Number (PCN) and Suitability of Existing Runway for use at Surat Airport. (M)
9. Evaluation of Serviceability of Pavement Surface of Eastern and Western Express Highways in Mumbai Region from traffic safety point of view by assessing / measuring Roughness Index and Skid Resistance. (PL)
10. Evaluation of ARRB Roughometer II under Indian Conditions. (PL)
11. Evaluation of Intelligent Transport Systems (ITS) for Indian Conditions. (M)
12. Evaluation of Electronic Toll Collection System using Radio Frequency Identification based on Dedicated Short Range Communication Technology. (M)
13. Development of GIS Based National Highways Information System (TL-SSP4444-2006-2011)
14. Development of National Document /Guidelines on Use of Weigh-In-Motion System in India for Axle Load Monitoring. (PL)
15. Feasibility Study to Examine the Possibility for Installation of Weigh-In-Motion (WIM) System at Various Entry Points of Delhi.(M)
16. Functional and Structural Evaluations of Delhi-Noida-Delhi Flyway and Mayur Vihar Link Road Towards Determining the Maintenance and Strengthening Requirements (PL)
17. Quality Audit of Lucknow-Muzzaffarpur National Highway Project (LMNHP) Works

18. Consultancy Services for Conducting Road Safety Audit for PPP Projects on DBFO Basis. (M)
19. Development of Management System for Maintenance Planning and Budgeting of High Speed Road Corridors (TL-SIP30-2007-2013)
20. Road Inventorisation and Pavement Condition Survey on the Selected Road Stretches on National Highways using Vehicle Mounted Digital Video System Integrated with Global Positioning System (PL-CNP1928-2014-15)
21. Assessment of Orissa Road Network Using Falling Weight Deflectometer (FWD) and Automated Road Survey System (ARSS) (PL-CNP1929-2014-15)
22. Development of Database Management System for Delhi PWD Roads (Inner Ring Road and Outer Ring Road) (PL-CNP1857-2013-2014)
23. Evaluation of Economic Loss Due to Idling of Vehicles at Signalized Intersection and Mitigation Measures (M-ESC0204-2012-2017)
 - Development of Models between Fuel Loss and Emission
24. Development and Application of Technologies for Sustainable Transportation (M-ESC0106-2012-2017)
 - Design of Advanced Public Transport Information System using ITS Technologies
 - Development & Design of Advance Driving Simulator
25. Development of Indian Highway Capacity Manual (M-ESC0304-2012-2017)
26. Bicycle based Road Asset Management system (PL-OLP0583-2017-2018)
27. Impact of Road Condition on Fuel Consumption of Vehicle (M-GAP4564-2017-2018)
28. Self-healing Technology for Bituminous Pavements through Induction Energy (M-OLP0585-2016-2018)
29. Water Harvesting Using Porous Flexible Pavements (M-OLP0592-2016-2019)

Ongoing 2019 onwards

30. Development of Airfield Pavement Management System (PL-CNP2507-2019-2021)
31. Development of Road Maintenance Management System for Kerala PWD Roads (M-SSP4631-2019-2020)
32. Assessment of Odisha Road Network (Works Department) Using Modern Data Collection Techniques Such as Automated Road Survey System and Falling Weight Deflectometer (CoPL-CNP2323-2017-2020)
33. Assessment of Rural Road Network of Odisha Using Modern Data Collection Techniques Such as Automated Road Survey System and Falling Weight Deflectometer (CoPL-CNP2512-2019-2020)
34. Study on Decay in Modulus of Stabilized Aggregate in Flexible Pavement (M-SSP4618-2019-2022)

Other Technical Services (more than 150 system calibrated)

Coordinating as Project Leader and Head, Pavement Evaluation Division National Facility for Calibration of the following Response Type Road Roughness Measuring System and Static Axle Weight Pads

- Fifth wheel Bump Integrator
- Automated Road Unevenness Recorder
- Car Axle Mounted Bump Integrator

Acquisition of “major facilities”

Equipment			
Sl. No	Title of the Facility	Your role in brief	Beneficiaries
1.	Vehicle Mounted Automated Road Condition Monitoring System (2010)	Coordinating Operation, Field Surveys, Maintenance, Data Analysis and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
2.	Roughometer-III with GPS (2010)	Coordinating Operation, Field Surveys, Maintenance, Data Analysis and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
3.	ROMDAS-Bump Integrator with GPS (2010)	Coordinating Operation, Field Surveys, Maintenance, Data Analysis and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
4.	Walking Profiler (2010)	Coordinating Operation, Field Surveys, Maintenance, Data Analysis and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
5.	Weigh-In-Motion System (2011)	Technical Specifications, Evaluation of Bids, Commissioning, Operationalization , and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
6.	Pavement Video Imaging System (2011)	Technical Specifications, Evaluation of Bids, Commissioning, Operationalization , and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies

7.	Heavy Weight Deflectometer (2019)	Technical Specifications, Evaluation of Bids, Commissioning, Operationalization , and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
8.	Upgradation of Existing Heavy Weight Deflectometer (2019)	As Indenter, Preparation of Technical Specifications, Evaluation of Bids	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
9.	Procurement of High Speed Continuous Friction Measuring Equipment (2020)	Technical Member for Preparation of Specifications and Technical Evaluation of Bids	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
10.	Procurement of Ground Penetrating Radar (2020)	Technical Member for Preparation of Specifications and Technical Evaluation of Bids	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies

Software

Sl. No	Title of the Facility	Your role in brief	Beneficiaries
1.	Hawkeye Processing Tool Kit (2006)	Indenting Officer, Analysis and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
2.	HDM-4 Software (2009)	Indenting Officer, Analysis and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
3.	Arc-GIS Editor (2009)	Indenting Officer, Analysis and Training	R&D Project Activities of the Institute and Other Government

			Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
4.	Auto CAD MAP 3D (2011)	Indenting Officer, Analysis and Training	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
5.	ERDAS-Imagine Profession With Expansion Pack (2015)	Project Leader	R&D Project Activities of the Institute and Other Government Departments like MORTH, NHAI, PWDs, Research Institutes and Private Road Agencies
6.	PAVER (2019)	Project Leader	R&D Project Activities of the Institute and Other Government Departments like AAI, Research Institutes and Private Road Agencies

Workshop/Training programs organized:

S. No.	Name of the Event	Role	Attended by
1.	Training Programme on Development of Database on Inventory and Condition of Delhi PWD Roads (Ring Road and Outer Ring Road) on 13 th January, 2015 at CSIR-CRRI	Project Leader and Coordinator	Delhi PWD Engineers (EEs and SEs)
2.	Pavement Evaluation Techniques and their Applications for Maintenance and Rehabilitation (Every year in the month of November/December)	Coordinator	Engineers from various organisations of India, Bhutan and Sri Lanka
3.	Workshop on “Development of Management System for Maintenance Planning and Budgeting of High Speed Road Corridors” on 07 th October, 2015 at CSIR-CRRI	Key Member of the Organising Team	Engineers from various organisations of India have participated
4	Customized Training Program on Road Maintenance Management System (RMMS) for Kerala PWD from 17 to 19 June , 2019 at Thiruvananthapuram, Kerala	Head (Pavement Evaluation Division) and Faculty	Engineers from PWD Kerala

Course Coordinator/Faculty under the following Training Programs/Technical Events organized by CSIR-CRRI under the Aegis of HRD Activity of the Institute

1. “International Course on Dissemination of HDM-4” at CSIR-CRRI, New Delhi from 13 to 24, October 2008
2. “Pavement Evaluation Techniques and Their Applications for Maintenance and Rehabilitation” at CSIR-CRRI, New Delhi from 03 to 07, November, 2008
3. Planning, Design, Construction Maintenance and Quality Control of Highways and Rural Road Works for Engineers of TCIL at CSIR-CRRI, New Delhi from 27 July, 2009 to 07 Aug, 2009
4. “International Course on Dissemination of HDM-4” at CSIR-CRRI, New Delhi from 09 to 20 Nov, 2009
5. “Pavement Evaluation Techniques and Their Applications for Maintenance and Rehabilitation” at CSIR-CRRI, New Delhi from 07 to 11 Dec, 2009
6. “International Course on Dissemination of HDM-4” at CSIR-CRRI, New Delhi from 27 Sept, 2010 to 8 Oct, 2010
7. “GIS Based National Highways Information System” (T-5 Scheme of MoRT&H) for the Officials of Ministry of Road Transport and Highways, Government of India at CSIR-CRRI, New Delhi from 28 to 30 October, 2010
8. “Pavement Evaluation Techniques and Their Applications for Maintenance and Rehabilitation” at CSIR-CRRI, New Delhi from 06-10 December, 2010
9. “International Course on Dissemination of HDM-4” at CSIR-CRRI, New Delhi from 20 Dec, 2010 to 14 Jan, 2011
10. Workshop-Cum-Road Safety Audit Training at CSIR-CRRI, New Delhi from 13 to 14 Jan, 2011
11. Customized Training Programme on Collection of Road Roughness Data Using ROMDAS and DCP for the Engineers of RCD, Bihar at CSIR-CRRI, New Delhi from 28 Feb, 2011 to 02 Mar, 2011
12. “Pavement Evaluation Techniques and Their Applications for Maintenance and Rehabilitation” at CSIR-CRRI, New Delhi from 30 June, 2011 to 02 July, 2011
13. AcSIR-Colloquiums 2011 on 12 Jan, 2011
14. Hindi Lecture on 10 Jan, 2011 at CRRI, New Delhi
15. “Geo-Spatial Technology (GIS, GPS, RS etc.) for Roads & Transportation” organised at CSIR-CRRI, New Delhi from 04 to 07 Feb, 2013

16. "Electronic Toll Collection System" as Distinguished Speaker in Infraline Energy's Annual Conference on Tolling Issues in India, organised at New Delhi on 26 Feb, 2013
17. Training Demonstration and Test Methods of Roughometer and Viscometer for Testing and Research Institute, Road Construction Department Patna at CSIR-CRRI, New Delhi from 13 to 15 May, 2013
18. "International Course on Dissemination of HDM-4" at CSIR-CRRI, New Delhi from 16 to 27 Sept, 2013
19. One-day Workshop on Road Asset Management at Jammu on 14th Dec, 2013
20. "Pavement Evaluation Techniques and their Applications for Maintenance & Rehabilitation" at CSIR-CRRI, New Delhi from 16 to 20 Dec, 2013
21. "Geo Spatial Technology (GIS, GS, RS etc.) for Roads and Transportation" at CSIR-CRRI, New Delhi, from 06 to 09 Jan, 2014
22. "Data Collection & Interpretation using Automated Data Collection Technologies and Highway Development and Management Tool (HDM-4)", for Highway Engineers, Government of Iraq, Iraq at CSIR-CRRI, New Delhi, from 16 to 27 June, 2014
23. "International Course on Dissemination of HDM-4" at CSIR-CRRI, New Delhi from 15 to 26 Sept, 2014
24. Demonstration of Pavement Evaluation Techniques to Delegation of Trainees from MoRTH and NHAI on 18 Nov, 2014
25. "Pavement Evaluation Techniques and their Applications for Maintenance & Rehabilitation" at CSIR-CRRI, New Delhi from 24 to 28 Nov, 2014
26. "Quality Control, Supervision of Road Works and Contract Management" for the Civil Engineers from Ethiopia, at CSIR-CRRI, New Delhi from 23 to 27 March, 2015
27. "International Course on Dissemination of HDM-4", at CSIR-CRRI, New Delhi from 07 to 08 Sept, 2015
28. "Pavement Evaluation Techniques & Their Applications for Maintenance & Rehabilitation" at CSIR-CRRI, New Delhi from 14 to 18 Dec, 2015
29. "Geo-Spatial Technology (GIS, GPS, RS etc.) for Roads and Transportation" at CSIR-CRRI, New Delhi from 18 to 21 Jan, 2016
30. One-day Road Asset Management" Workshop Organised by UPPWD, Lucknow on 17 Feb, 2016

31. Certification Course on “Road Safety Audit and Other Road Safety Related Aspects” at CSIR-CRRI, New Delhi, May 2017
32. “Pavement Evaluation Techniques and their Applications for Maintenance & Rehabilitation of Airfield Pavements” from 19 to 25 June, 2017
33. “International Course on Dissemination of HDM-4” at CSIR-CRRI, New Delhi from 11 to 22 Sept, 2017
34. “Pavement Evaluation Techniques & Their Applications for Maintenance & Rehabilitation” at CSIR-CRRI, New Delhi from 04-08 Dec, 2017
35. Certification Course on “Road Safety Audit and Other Road Safety Related Aspects” at CSIR-CRRI, New Delhi, May 2017
36. “Pavement Evaluation Techniques and their Applications for Maintenance & Rehabilitation of Airfield Pavements” from 19 to 25 June 2017
37. “International Course on Dissemination of HDM-4” at CSIR-CRRI, New Delhi from 11 to 22 Sept, 2017
38. “Pavement Evaluation Techniques & Their Applications for Maintenance & Rehabilitation at CSIR-CRRI, New Delhi from December 04 to 08, 2017
39. “Pavement Evaluation Techniques and their Applications for Maintenance & Rehabilitation” for the Officers of Indian Air Force at CSIR-CRRI, New Delhi from 29th Jan, 2018 to 02 Feb, 2018
40. “Geo-Spatial Technology (GIS, GPS, RS etc.) for Roads and Transportation” at CSIR-CRRI, New Delhi from 06 to 09 Feb, 2018
41. "Capsule on Airfield Engineering" for the Officers of BRO, at CSIR-CRRI, New Delhi from 02 to 06 April, 2018
42. Delegation from Uganda for possible MoU between CSIR-CRRI and UNRA, Uganda, attended meeting and demonstrated the divisional facilities on 08 Aug, 2018
43. “Design, Construction, Quality Control and Repair & Rehabilitation of Rigid Pavements” at CSIR-CRRI, New Delhi from 10 to 14 Sept, 2018
44. Interactive meet with visiting students under Celebration of CSIR Foundation Day at CSIR-CRRI, New Delhi on 26 Sept, 2018
45. “Pavement Evaluation Techniques & Their Applications for Maintenance & Rehabilitation” at CSIR-CRRI, New Delhi from 29 Oct, 2018 to 02 Nov, 2018
46. “International Course on Dissemination of HDM-4” at CSIR-CRRI, New Delhi from 26 Nov, 2018 to 07 Dec, 2018

47. "Capsule on Airfield Engineering" for the Officers of BRO, New Delhi f at CSIR-CRRI, New Delhi from 10 to 14 Dec, 2018
48. Orientation Programme for Civil Engineering Students of Rajeev Gandhi College of Engineering & Research, Nagpur at CSIR-CRRI, New Delhi on 13 Dec, 2018
49. Certification Course on "Road Safety Audit and Other Road Safety Related Aspects" at CSIR-CRRI, New Delhi, 10 to 24 Dec, 2018
50. Orientation Program for the participation of Indian Academy of Highway Engineers at CSIR-CRRI, New Delhi on 28th Dec, 2018
51. Interactive meet with Kendriya Vidyalaya Students under JIGYASA programs at CSIR-CRRI, New Delhi on 16th May, 3rd July, 6th July, 21st Aug, 24th Aug, 28th Aug, 2018 and 28th Jan, 2019
52. "Pavement Evaluation Techniques and their Applications for Maintenance and Rehabilitation" for the Officers of SIRD&PR, Tamil Nadhu at CSIR-CRRI, New Delhi from 01-05 July, 2019
53. "Pavement Evaluation Techniques and their Applications for Maintenance and Rehabilitation" for the Officers of Indian Air Force at CSIR-CRRI, New Delhi from 15-19 July, 2019
54. "Capsule on Airfield Engineering" for the Officers of BRO, New Delhi at CSIR-CRRI, New Delhi from 02-06 Dec, 2019
55. "Pavement Evaluation Techniques & Their Applications for Maintenance & Rehabilitation" at CSIR-CRRI, New Delhi from 06-10 Jan, 2020

Guidance/ Supervision to Students for their Dissertation/Project Works

1. B. E. Electrical (IIIrd year) student of Aligarh Muslim University, Aligarh on the topic “Design and Development of High Voltage Power Supply for Geiger Muller Tube” from 03.06.2003 to 17.07.2004.
(Mr. Gaurav Raja Bansal)
2. B. E. Electrical (IIIrd year) student of Aligarh Muslim University, Aligarh on the topic “Development of Assembly Language Program for Data Acquisition and Control” from 03.06.2003 to 17.07.2004. (Mohd. Nadeem Khan)
3. B. E. (instrumentation & Control) student of Netaji Subhas Institute of Technology, University of Delhi, Delhi on the topic “Application of Global Positioning System (GPS) and Laser Technology in Highway Engineering” from 02.06.2007 to 25.07.2007. (Mr. Sumit Pokhriyal)
4. Diploma (Digital Electronics) students (Two Students) of Guru Tegh Bahadur Polytechnique Institute, Vasant Vihar, New Delhi on the topic “High speed Detection of Pavement Distresses using Video Image Processing Tools” from 15.01.2008 to 29.02.2008. (Ms. Suman and Ms. Sudha)
5. B. Tech. (Computer Science) Student of Maharaja Surajmal Institute of Technology, (Indraprastha University) New Delhi on the topic “Application of Geographical Information System for Indian Roads” from 02.06.2008 to 11.07.2008. (Ms. Nidhi Lamba)
6. B.Tech (Electronics & Communication) Student of Jaypee University of Information Technology, Solan on the topic “Application of Laser Technology in Highway Engineering” from 01.06.2008 to 17.07.2008. (Mr. Siddhartha Mathur)
7. MCA Student (Two Students) of H. B. T. I. Kanpur on the topic “Development of Software for the Computation of International Roughness Index, using Pavement surface Profile Data”. from 02.02.2009 to 15.07.2009. (Mr. Mayank Rathore and Mr. Narendra Kumar)
8. UNIGIS Professional Post Graduate Diploma in Geo-Informatics Students from GIS Institute, Noida (Two Students) on the topic “Application of GIS and Advanced Survey Tools for Highway Inventory Management” from March, 2009 to July, 2009. (Ms. Arifa Begum)
9. UNIGIS Professional Post Graduate Diploma in Geo-Informatics Students from GIS Institute, Noida (Two Students) on the topic “GIS Based Highway Information System” from March, 2009 to July, 2009. (Ms. Priyanka Verma)

10. UNIGIS Professional Post Graduate Diploma in Geo-Informatics Students from GIS Institute, Noida (Two Students) on the topic “Application of GIS and Advanced Survey Tools for Highway Inventory Management” from March, 2009 to July, 2009. (Mr. Sharfaraj Nawaj Tosrif Zaman)
11. UNIGIS Professional Post Graduate Diploma in Geo-Informatics Students from GIS Institute, Noida (Two Students) on the topic “Application of GPS Technologies for the development of GIS based Information System for Major Roads” from March, 2009 to July, 2009. (Ms. Smita Nooreen Khan)
12. B.Tech (Civil) Student of World College of Technology & Management, Gurgaon (Haryana), on the topic “Bituminous Roads and their Performance Evaluation by Roughness Measurements” from 08.06.2009 to 31.07.2009. (Mr. Navneet Singh Pundir)
13. B.Tech (Civil) Student of World College of Technology & Management, Gurgaon (Haryana), on the topic “Techniques for Evaluation of Skid Resistance of Pavement Surfaces” from 08.06.2009 to 31.07.2009. (Mr. Preetam Singh)
14. B.Tech (Civil) Student of World College of Technology & Management, Gurgaon (Haryana), on the topic “Equipments for Structural evaluation of Pavement” from 08.06.2009 to 31.07.2009. (Mr. Prashant Sohla)
15. B. Tech. (Computer Science) Student of Maharaja Surajmal Institute of Technology, (Indraprastha University) New Delhi on the topic “Application of Database Management System for Highways” from 15.06.2009 to 30.07.2009. (Ms. Nidhi Lamba)
16. M. Tech. (Transportation Systems) Student of National Institute of technology, Karnataka, Surathkal, on the topic Health Monitoring of Pavements Using Non-Destructive testing Methods” from 07.06.2010 to 21.07.2010. (Mr. J. C. Sunil Kumar)
17. M. Tech. (Transportation Systems) Student of National Institute of technology, Karnataka, Surathkal, on the topic Health Monitoring of Pavements Using Non-Destructive testing Methods” from 07.06.2010 to 21.07.2010. (Ms. Deepa C.)
18. M. Tech. (Highways & Transportation Engg.) Student of The Maharaja Sayajirao University of Baroda, Faculty of Technology, Kalabhavan, Vadodara on the topic “Structural Evaluation and Overlay Design of Flexible Pavement using Benkelman Beam and Falling Weight Deflectometer”, from 19.07.2010 to 14.03.2010. (Mr. Vishal R. Mehta)

19. B. Tech (Civil Engineering), 3rd year, student of Indian Institute of Technology, Kharagpur on the topic "Road Inventory and Pavement Condition Survey using Automated Road Survey System" from 02.05.2011 to 02.07.2011 (Mr. Deepak Boora)
20. B. Tech. (Electronics and Electrical Engineering), 3rd year, student of H. R. Institute of Technology, Gaziabad on the topic "Electronic Devices for the Measurement of Surface Conditions and Geometrics of Roads" from 13.06.2011 to 12.07.2011. (Mr. Nikhil Chaudhary, Mr. Vaibhav Saxena and Ms. Deepali Verma)
21. MCA, Final year Student of Shri Ram Murti Smarak College of Engineering and Technology, Bareilly on the topic "Pavement Data Management System" from 16.01.2012 to 30.06.2012. (Mr. Manish Mishra)
22. B. Tech. (Civil Engineering) from JSS, Mahavidyapeetha, on the topic "Evaluation of Pavement Surface Condition using International Roughness Index and Pavement Surface Distress Data" from 20.06.2012 to 31.07.2012. (Mr. Aakash Gupta)
23. B. Tech. (Electronics and Instrumentation) from IIMT College of Engineering, Greater Noida, on the topic "Sensor Technology for Monitoring of Overloading of Commercial Vehicles in India" from 18.06.2012 to 03.08.2012. (Mr. Shekhar Rathi)
24. M.Tech. (Civil Engineering-Traffic and Transportation Planning) from National Institute of Technology, Calicut, on the topic "Pavement Evaluation Techniques for Pavement Management System" from 06.05.2013 to 20.06.2013 (Mr. Amit Kumar Das)
25. M.Tech. (Civil Engineering-Traffic and Transportation Planning) from National Institute of Technology, Calicut, on the topic "Pavement Evaluation Techniques for Pavement Management System" from 06.05.2013 to 20.06.2013 (Ms. Parvathy Bhai P)
26. B. Tech. (Electronics & Communication Engineering) from Ambedkar Institute of Advanced Communication Technologies and Research, (Indraprastha University) New Delhi, on the topic "Sensor Technologies for Functional and Structural Evaluation of Roads" from 01.07.2013 to 31.07.2013 (Mr. Rahul Singh)
27. B.Tech. (Computer Science and Engineering) Student of Amity University, Uttar Pradesh, on the topic "Image Processing Technique for Assessment of

- Pavement Surface Defects using Hawkeye Software and Web Application Development using Java and C#.net” from 13.05.2015 to 03.07.2015. (Ms. Kanika Jain)
28. M. Tech. (Transportation Engineering and Planning) from Sardar Vallabhbhai National Institute of Technology Surat, Gujrat on the topic “Structural Evaluation of Flexible Pavement Using Falling Weight Deflectometer” in this institute from 25.05.2015 to 08.07.2015. (Mr. Vinay Gautam)
29. M. Tech (Transportation Engineering and Planning) from Sardar Vallabh Bhai National Institute of Technology, Surat on the topic “A Critical Review on Road Asset Management Integrated with Decision Making Software” from 26.05.2014 to 10.07.2014. (Mr. Aniket Shirke)
30. M. Tech (Transportation Engineering and Planning) from Sardar Vallabh Bhai National Institute of Technology, Surat on the topic “Automated Road Data Collection Techniques for Road Asset Management” from 26.05.2014 to 10.07.2014 (Mr. Tapan Khandelwal)
31. M. Tech (Traffic and Transportation Planning) from National Institute of Technology, Calicut on the topic “Structural Evaluation of Flexible Pavement” from 02.06.2014 to 11.07.2014. (Ms. Amitha T P and Ms. Anju K)
32. M. Tech (Transportation Engineering) from National Institute of Technology, Warangal on the topic “Evaluation of Pavement Surface Condition Using Artificial Neural Network” in this institute from September, 2013 to April, 2014. (Mr. Suraj M S)
33. M. Tech (Integrated Construction Engineering and Management) from Shanmuga Arts Science Technology and Research Centre (SASTRA) University, Thanjavur on the topic “Road Asset Management System using GIS” from January, 2014 to April, 2014. (Mr. C. S. Mogan Kumar)
34. M. Tech Transportation, PGRPE Student of AcSIR at CRRI on the topic “Development of Correlation between Roughness Index and International Roughness Index” from July 2013 to July 2014. (Mr. Amal Raj)
35. M. Tech. Transportation Engineering from National Institute of Technology, Kurukshetra on the topic “Pavement Performance Prediction Models and their use in Road Asset Management” from Aug 2014 to May 2015. (Mr. Aakash Gupta)
36. M. Tech. Transportation Engineering from Department of Civil Engineering, National Institute of Technology, Patna on the topic “Sensitivity Analysis of

- Vehicular Loading and Traffic Pattern Using HDM-4 for High Speed Road Corridor” from August,2015 to April, 2016 (Mr. Mayur Chopde)
- 37.M. Tech. Transportation Engineering from Department of Civil Engineering, National Institute of Technology, Patna on the topic “Development of Pavement Maintenance Management System based on unified pavement condition Index”, from June 2018 to November 2018. (Mr. Madhavendra Sharma)
- 38.M. Tech. Transportation Engineering from VNIT, Nagpur on the topic “Computational Approach for Airfield Pavement Management System”, from Jan 2019 to May 2019. (Mr. N. Gouri Shankar Rao)
- 39.M. Tech. Transportation Engineering from BITS, Pilani, Hyderabad Campus on the topic “Development of maintenance tool for rural roads”, from Jan 2019 to May 2019. (Mr. Aqeel Ahamad)
- 40.M. Tech. Infrastructure Engineering from Thapar Institute of Engineering and Technology, Patiala on the topic “Evaluation of different software for analysing falling weight Deflectometer data”, from July 2018 to June 2019. (Mr. Subham Mishra)
- 41.M. Tech. Transportation Engineering from Samrat Ashok Technological Institute, Vidisha on the topic “Maintenance & Rehabilitation Assessment of Airfield Pavement based on Functional and Structural Evaluation”, from December 2019 to May 2020. (Mr. Himanshu Jain)
- 42.M. Tech. from RASTA Centre for Road Technology, Bangalore on the topic “Comparison of Different pavement rating techniques for prioritization of rural road network”, from Jan 2020 to June 2020. (Ms. Ranjitha RL)
- 43.M. Tech. from RASTA Centre for Road Technology, Bangalore on the topic “Evaluation of Pavement Surface Distresses using Image Processing and ANN”, from Jan 2020 to June 2020. (Mr. Suhas TR)

Research Papers – Published

1. Singh, D.P., Pant, R.P., Kumar, P., and Rawat, K.B., (1997), The Effect of Dust-Laden Air on Human Health: X-ray Studies, MAPAN-Journal of Metrology Society of India, Vol. 12, No. 2-4, PP. 268-271.
2. Kumar, P., and P. K. Jain, (1998), Semi Automatic Toll Collection System, International Seminar on Highway Safety Management & Devices, 6-7 Nov. 1998, Indian Roads Congress, New Delhi, PP. IV-64 – IV-71.
3. Sharma, S.D., Kumar, P., and Nanda, P.K., (2001), Importance of Standardisation of Response Type Road Roughness Measuring Devices for Condition Assessment of Highways - Case Studies, Highway Research Bulletin Indian Roads Congress, New Delhi, No. 64, June 2001, PP.
4. Kumar, P., Gupta, H., and Nanda, P.K., (2001), Intelligent Transport System- A Step Towards Control Traffic Management, International Seminar on Sustainable Development in Road Transport, Vigyan Bhawan, New Delhi from 8th to 10th November, 2001, PP.
5. Sharma, S.D., Kumar, P., and Nanda, P.K., (2005), Cement Concrete Pavements-Sustainable Rideability and Fuel Economy, 9th NCB International Seminar on Cement and Building Materials, November, 2005, New Delhi, PP.
6. Kumar, P., and Kumar, P.P., (2009) Advanced Sensor Technology used for Development of Electronic Toll Collection System, (2009), Journal of the Instrument Society of India, Vol. 39, No. 4, December 2009, PP.
7. Kumar, P., Sharma, B.M., and Kota, S., (2010), Current Practices for Pavement Condition Monitoring of Road Infrastructure in India, 24th ARRB Conference 2010 held at Melbourne, Australia from 12.10.2010 to 15.10.2010, PP.
8. Kota, S., Sharma, B.M., Tiwari, D., and Kumar, P., (2010), National Efforts Towards Management of High Speed Road Corridors in India, 24th ARRB Conference 2010 held at Melbourne, Australia from 12.10.2010 to 15.10.2010, PP.
9. Kumar, S., Pokhriyal, S.P., Sharma, B.M., and Kumar, P., (2013), Significance of Pavement Surface Friction and Case studies in India, Highway Research Journal, Indian Roads Congress, New Delhi, Volume 6 No. 1, Jan-June 2013, PP.
10. Kumar, P., and Kota, S., (2014), Modern Data Collection Techniques for Management of Road Assets, New Building Materials & Construction World (NBM&CW), Volume-19, Issue No. 9, March 2014, PP. 130 to 134.
11. Kumar, P., and Kota, S., (2014), Efforts Towards Development of Sustainable Road Asset Management System, Published in the proceedings of the International Conference on Sustainable Civil Infrastructure 2014 (ICSCI), Organised by The India Section of American Society of Civil Engineers (ASCEIS), October 17-18, 2014, IIT, Hyderabad, PP. 796-803.

12. Sekhar, C.R., Nataraju, J., Velmurugan, S., Kumar, P., and Kota, S., (2014), Free Flow Speed Analysis of Two Lane Inter Urban Highways, International Conference on Transportation Planning and Implementation Methodologies for Developing Countries (11th TPMDC), December 10-12, 2014, IIT Bombay, Organized by Transportation Systems Engineering, Department of Civil Engineering, Indian Institute of Technology, Bombay, Powai, Mumbai-400076, India, PP.108 to .
13. Sharma, S.D., Agarwal, R.C., Kumar, P., and Nanda, P.K., Assessment of Riding Quality using Automatic Road Unevenness Recorder -Case Studies, National Seminar on Challenges for Road Transportation in 21st Century Leading to Fuel Economy, CIRT 2001, 23-24 Feb, 2001, Thaper Institute of Engineering and Technology, Patiala, PP. 270 to 279.
14. Rao, Y.V., Kumar, P., (2005), "Automated System for Weight Monitoring and Enforcement in High Speed Corridors", Proceedings of Seminar on High Speed Road Corridors organized by Indian Roads Congress, September 23-24, 2005, New Delhi, PP.
15. Kumar, P., (2005), "Use of Information and Communication Technology to Improve Traffic Conditions of Roads", Proceedings of Seminar on High Speed Road Corridors organized by Indian Roads Congress, September 23-24, 2005, New Delhi, PP.
16. Kumar, P., Sharma, B.M., and Rao, Y.V., (2010), Suggestions for Selection of Appropriate Roughness Measuring Equipment in Different Operating Conditions, IRC Seminar on Roads in High Precipitation Areas, 19-20 February 2010, Guwahati, Assam, PP. 4-9 to 4-15.
17. Kannan, S Kumar, P., and Bhardwaj, R.S., (2009), "Telematics Techniques and Applications on Transportation an Overview", National Conference on Current Trends in Telematics, 28 to 30 October 2009, Organised by Sriram Engineering College, Chennai, PP.
18. Kannan, S., Kasparraj, I., Kumar, P., Bharadwaj, R.S., and Naqvi, (2010), A New Approach using Image Processing Technique for Highway Applications, National Conference on Image Processing (NCIMP 2010), 12th & 13th February, 2010, Organized by Department of Computer Science & Applications, The Gandhigram Rural Institute-Deemed University, Gandhigram
19. Kumar, P., Kota, S., (2012), Advanced Techniques for the Development of Pavement Information and Management System, CSIR-CRRI Diamond Jubilee Celebrations, July 2012, PP.
20. Kumar, P., Pal, N.C., Kota, S., and Pradhan, B.C., (2015), Assessment of Roads in the State of Odisha Using Automated Data Collection Techniques, 75th Annual Session of Indian Roads Congress, 18th to 22nd Jan 2015, Bhubaneswar (Odisha), Works Department, Government of Odisha, PP. 52-56
21. Tiwari, D., Kumar, P., Gangopadhyay, S., (2015), State-of Art Technologies in Data Collection for Road Asset Management, 75th Annual Session of Indian Roads Congress, 18th to 22nd Jan 2015, Bhubaneswar (Odisha), Works Department, Government of Odisha. PP. 82-87.

22. Patel, P.H., Sekhar, C.R., Kumar, P., Jain, M.P., Rathva, D. M., (2015), Effect of Roughness on Free Flow Speed of Intermediate Lane Inter Urban Highways, 2nd Conference of Recent Advances in Traffic Engineering (RATE15) on 03 and 04 JULY , 2015, SVNIT, Surat, CD (S.No.139)
23. Kota, S., and Kumar, P., (2015), Technologies for Development of Road Database and Information system, National Seminar on Recent Advances in Civil Engineering, AKS University, Department of Civil Engineering, RACE), 25th -26Th September, 2015, Satna, AKS University, Department of Civil Engineering, RACE), Satna, 99-104.
24. Chopde, M., Sinha, S., Tiwari, D., and Kumar, P., (2016), Impact of Optimal Budget Utilization for Maintenance of Flexible Pavements, Conference on Sustainable Asphalt Pavement for Developing Countries, 11 - 12 March 2016, CSIR-CRRI, New Delhi.
25. Gupta, A., Kumar, P., Aggarwal, P., Kota, S., (2016), Pavement Performance Prediction Models and Their Use in Road Asset Management, Conference on Sustainable Asphalt Pavement for Developing Countries, 11 - 12 March 2016, CSIR-CRRI, New Delhi
26. Kota., S., and Kumar, P., (2017), "Development of Pavement Maintenance Management System for High Speed Road Corridors Using State-of-Art Technologies", International Road Federation Meeting 14-17 November, 2017, Noida.
27. Kumar, S., Tiwari, D., Kumar, P., Jain, S., (2017), "Self-healing Pavements: A Revolution in Pavement Materials", International Road Federation Meeting 14-17 November, 2017, Noida.
28. Kumar, P., Garg, P. K., Parida, M., (2018), "Development of a Road Information and Management System Using Geospatial Tools", International Conference on Geomatics in Civil Engineering, Department of Civil Engineering, Indian Institute of Technology Roorkee, Roorkee, pp. 40.
29. Kumar, P., Kota, S., (2018), "Use of Modern Technologies for Maintenance of Delhi Roads", Proceedings of International Conference on Pavements and Computational Approaches (ICOPAC-2018), CSIR-Central Road Research Institute, New Delhi., pp. 213-223.
30. प्रदीप कुमार, के. सीतारामान्जनेयुलु, " आधुनिक प्रौद्योगिकियों द्वारा सड़क सूचना एवं प्रबंधन प्रणाली का विकास", सड़क दर्पण, जून 2018 , सी एस आई आर-सी आर आर आई, नई दिल्ली।
31. Sharma, M., Suman, S. K. and Kumar, P., (2019), "Application of Multi Criteria Decision Making (MCDM) in prioritization of Road Network for Maintenance and Rehabilitation (M&R) Works", in Proceedings of Seventh Annual International Conference on Architecture and Civil Engineering, Singapore. (Indexed by Scopus)
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Analytic Hierarchy Process”, Sixth Colloquium on Transportation Systems Engineering and Management, NIT Surat, June 2019

33. Kota, S., Kumar, P., (2019), "A Systematic Approach for Development of Pavement Maintenance Management System", NBM & CW, Infra Construction and Equipment Magazine, September, 2019, Vol.-25, Issue-3, pp.102-104.
34. Mishra, S., Srivastava, R. K., Kumar, P., Chopra, T., (2019), "Comparison of Various approaches for Evaluation and Overlay Design of Concrete Pavement", 5th Conference of Transportation Research Group of India (CTRG-2019), 18-21 December 2019, Bhopal.
35. Mishra, S., Srivastava, R. K., Kumar, P., Chopra, T., (2019), "Analysis of Falling Weight Deflectometer (FWD) Data of a Flexible Pavement Using Two Different Programs", 5th Conference of Transportation Research Group of India (CTRG-2019), 18-21 December 2019, Bhopal.

Major Events/Conferences/Seminars Attended

1. Eighth International Workshop on Physics of Semiconductor Devices (IWPSD), 11-16 Dec 1995, National Physical Laboratory, New Delhi
2. International Seminar on Highway Safety Management and Devices, 06-07 Nov 1998, Vigyan Bhawan, New Delhi, Indian Roads Congress
3. 59th Annual Session of Indian Roads Congress, Jan-Feb, 1999, Hyderabad
4. National Seminar on Challenges for Road Transportation in 21st Century Leading to Fuel Economy, CIRT 2001, 23-24 Feb, 2001, Thaper Institute of Engineering and Technology, Patiala
5. International Seminar on Sustainable Development in Road Transport, Vigyan Bhawan, New Delhi from 8th to 10th November, 2001.
6. 7th Asia Pacific Conference & Exhibition, organized by Intelligent Transport system (ITS), India from 9-11 August 2005 at New Delhi.
7. Seminar on High Speed Road Corridors, organized by Indian Roads Congress, September 23-24, 2005, at Vigyan Bhawan, New Delhi
8. International Conference on Surveying, Positioning and Locational Intelligence, October, 2005, Taj Palace, New Delhi, GRATICULE
9. Indo-Belarus Seminar on Emulsions, October, 2005, CRRI, New Delhi
10. 66th Annual Session of Indian Roads Congress, November 2005, Bhubaneswar
11. Technical Presentation and Demonstration of ROMDAS by Data Collection Limited, New Zealand at IITR, Roorkee on 10.03.2006
12. ROMDAS (Road Measurement Data Acquisition System, New Zealand) User's Conference, 04-05 Oct, 2007, New Delhi
13. 68th Annual Session of Indian Roads Congress, November 2007, Jaipur
14. National Symposium on Instrumentation (NSI-33), 08-10 December, 2008, Andhra University College of Engineering, Vishakhapatnam
15. Workshop on Mobile Mapping Technologies for Road Asset Information and Management, 17th July, 2009, CRRI, New Delhi
16. Recent Developments in Highway and Airport Pavement Engineering, 07-08 Aug, 2009, IIT Madras, Chennai
17. 13th Annual International Conference and Exhibition on Geospatial Information Technology and Applications, Map India 2010, 19-21 Jan, 2010, GIS Development Noida

18. National Get Together on “Road Research and Its Utilization”, 05-06 Mar, 2010, CRRI, New Delhi
19. 11th ESRI India User Conference 2011, 21-22 April, 2010, ESRI, Noida
20. 24th ARRB Conference 2010, 12-15 October, 2010, Melbourne, Australia
21. Workshop-Cum-Road Safety Audit Training, from 13-14 January, 2011, CRRI, New Delhi
22. National Get Together on “Road Research and Its Utilization”, 01-02 Mar, 2012, CRRI, New Delhi
23. Infraline Energy’s Annual Conference on Tolling issues in India, 26 February, 2013, New Delhi (Delivered talk on “Electronic Toll Collection” as a distinguish speaker)
24. Workshop on Advanced Geo-Spatial Solution on 08.05.2013 at CRRI
25. CSIR-CRRI & Volvo CE workshop on Road Construction Machinery: Creating Benchmarks (RCM), Oct. 25-26, 2013, NAL Campus, Bengaluru
26. Seminar on GIS for Roads & Highways on 10.12.2013 and 14th ESRI India User Conference 2013 and Exhibition on 11-12 Dec. 2013 at Kempinski Ambience Hotel, Delhi
27. Workshop of Indian Highways Capacity Manual-2014 (RIHCAM-2014) of the Project “Development of Indian Highway Capacity Manual (Indo-HCM), Chennai, 28-30 March 2014.
- 28.** Advanced Leadership Development Programme from 01.09.2014 to 05.09.2014 at CSIR-HRDC, Ghaziabad
29. Workshop cum Exhibition “Adoption of Innovative Technologies and Materials for Road Construction in India on 20-21 Feb 2015 at IAHE, Noida
30. ReCAP-Regional Meeting on 30-31 August 2015, CSIR-CRRI
31. Workshop on Road Asset Management System for National Highways Under World Bank Funded Project (WBTA-12) of NHAI, organized by SATRA, on 15.05.2015 at India Habitat Centre, New Delhi
32. Sustainable Asphalt Pavement for Developing Countries (CONSAP-2016) on 11-12 March, 2016
33. National Workshop on Driving Simulator on 10.02.2016 at CSIR-CRRI
- 34.** Workshop on “Mental Models and System Thinking, 25th July 2018, CSIR-CRRI, New Delhi
35. Workshop on "Learning Disabilities and Personal Mastery" on 27th July, 2018.

36. International Conference on “Pavements and Computational Approaches” (ICOPAC-2018), 16-17, November, 2018, CSIR-CRRI, New Delhi
37. 79th Annual session of Indian Road Congress, 22-25, November, 2018, Nagpur

Other Important Contributions

Association with Academy of Scientific and Industrial Research as Guest Faculty for PGRPE Course on “Health Monitoring of Road Infrastructure” for M.Tech. and Ph.D. Students

News Paper Clippings (2019)

THE TIMES OF INDIA, ERNAKULAM, SATURDAY, JUNE 15, 2019

In a first, PWD digitizing its road assets

TIMES NEWS NETWORK

Tirupuram: Public works department (PWD) is digitizing its assets to execute maintenance in an effective manner and starting next week, its engineers will be trained on how to go about the process. PWD has appointed New Delhi-based Central Road Research Institute (CRRI) as the nodal agency to implement the Road Maintenance Management System (RMMS).

RMMS is a digitized, road maintenance programme which relies on analysis and it is based on factors such as condition of road, vehicle density, quality etc. As a first step, funds have been allotted from World Bank-funded KSTP for execution of the project covering 4,000km of city roads.

PWD minister G Sudhakaran said that digitization of assets is happening for the first time in the department. “With digitization of state roads, maintenance, disaster management and relief measures can be executed in an efficient manner,” he said.

As part of introducing RMMS, employees of PWD’s technical wing will have to use network survey vehicle (NSV) to take data. A three-day training course on using NSV will be held from June 17-19 at PWD rest house. The minister will inaugurate the training programme. PWD secretary Anand Singh will preside over the event.

As per the PWD manual of 2012, RMMS will have a database covering all roads and bridges under PWD. It includes road data such as footpath, drains, kerbs, median, road inventory and pavement condition, traffic and work history.

RMMS will support development of annual road maintenance programme, strategies to enable the level of service required by road user, support the preparation of an adequate annual road maintenance budget, identify emergency works required in existing road, bridges and related infrastructure.

Now, PWD has a chief engineer exclusively for maintenance of its assets. The department had recently taken a list of bridges that needed immediate maintenance.

Airfield pavement management system in India for the first time

ABBINAYA KUZHANTHAIVEL
NEW DELHI, SEPTEMBER 19

THE AIRPORTS Authority of India (AAI), along with the CSIR-Central Road Research Institute (CRRI), is set to install airfield pavement management systems (APMS) in a first, at 10 airports across India.

Chennai, Surat, Kolkata, Gaggal, Imphal, Agartala, Vadodara, Rajahmundry, Khajuraho and Gaya are the medium traffic airports short-listed for the APMS project. It will assist airport managers in developing viable strategies to maintain the pavements in a serviceable condition over a given period and quantify information on maintaining a pavement network at an acceptable level of service. It will also optimise pavement-related expenditure. The APMS will work in the concept of digitisation with scientific equipment. The CSIR-CRRI will assess the runways’ functional and structural condition using state-of-the-art technology. Based on the survey parameters, the APMS system will function as a condition index, which will score the status as excellent or poor. The runways can be revamped or conditioned ensuring good maintenance.

Anil Kumar Pathak, member (planning), AAI, said, “The pavement is probably the most important airport asset. This is particularly the case for single-runway airports such as a majority of the Indian airports. It should be constructed and maintained at acceptable levels

Chennai, Surat, Kolkata, Gaggal, Imphal, Agartala, Vadodara, Rajahmundry, Khajuraho and Gaya are the shortlisted medium traffic airports

to meet international standards as pavements have a significant impact on airport users’ cost, safety, traffic delay, commercial performance and reputation. Keeping in view the above facts, initially, 10 airports across the country are set to have the APMS.”

Satish Chandra, director at CRRI (Council of Scientific & Industrial Research) said, “Around 10 airports in India will have APMS initially. (The) initiative... to tie up with the AAI for such an initiative (is happening) for the first time. We are planning to start once after the airport locations are confirmed.”

“The AAI has decided to develop its maintenance plans. This will ensure the durability of the runways and ensure safe landing and take-offs,” said Pradeep Kumar, senior principal scientist and head, pavement evaluation at CRRI-CSIR. Kumar added that a state-of-the-art network survey vehicle system, equipped with laser sensors, pavement surface imaging tools, GPS and structural condition data based on PWD equipment, will be used for health monitoring of the runway pavement network. “Various parameters like runway pavement surface distress, profile, friction, pavement classification number, along with some health indicators, will be used to get the rating score to decide the maintenance strategies scientifically. Some medium traffic airports were shortlisted,” said Kumar.

Pathak added: “Airfield pavements comprise multiple layers of engineered materials, such as asphalt, concrete and granular materials, designed to carry aircraft loading. Pavements deteriorate with time under loading and from environmental variations. Maintenance and rehabilitation are required to maintain serviceability throughout the pavement asset’s life.”

The project fieldwork is expected to start in October and will continue for three years. The budget has been set at Rs 4.5 crore. Pathak further added that as per prevalent practice, the full length of the pavement would be resurfaced after a certain period or in case of deterioration and with APMS, the weak portion could be identified well in advance to take up necessary rehabilitation or repair measures for that particular area.

With American and European countries having their own pavement management systems, India is not too late to start to ensure safety managements. Kumar added that the civil aviation ministry initiated the process. “The damages or faults in the pavements can be identified well in advance, which will help to avoid complete revamping of the pavement,” said Kumar.

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