

SAMPATH KUMAR PASUPUNURI

Principal Scientist, Pavement Evaluation Division

CSIR Central Road Research Institute

Ph.D. (Civil Engineering)

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PROFILE

I am a principal Scientist at the Central Road Research Institute (CRRI), specializing in pavement engineering, AI/ML applications, and sustainability in road infrastructure. My expertise includes pavement evaluation, smart pavement materials, and the development of self-healing technologies aimed at enhancing road durability and efficiency. With a focus on innovative, data-driven solutions, I contribute to the optimization of infrastructure performance and long-term sustainability. I am dedicated to advancing road infrastructure through cutting-edge research and practical engineering applications.

EDUCATION QUALIFICATION

Ph.D. | *University of Nottingham, United Kingdom* | 2021-2024

M.Tech | *Visvesvaraya National Institute of Technology, India* | 2012-2014

B.Tech | *Jawaharlal Nehru Technological University, India* | 2008-2012

AREAS OF INTEREST

- Pavement deterioration modelling
- AI/ML applications in pavement engineering
- Structural evaluation of pavement
- Functional evaluation of pavement
- Road Asset Management
- Smart Pavement Materials

SOFTWARE SKILLS

HDM 4, Python, Minitab, AutoCAD, IIT Pave, KGP Back, QGIS and MS Office

MEMBERSHIPS

- Indian Road Congress – Member
- RILEM– Youth Member
- ASCE – Member
- IGS, Delhi Chapter – Member

WORK HISTORY

Principal Scientist | *CSIR Central Road Research Institute, New Delhi, India*
June 2025 - Present

Senior Scientist | *CSIR Central Road Research Institute, New Delhi, India*
June 2021 - June 2025

Scientist | *CSIR Central Road Research Institute, New Delhi, India*
June 2016 - June 21

Pavement Design Engineer | *K & J Projects Pvt. Ltd., Nagpur, India*
June 2015 – May 2016

Project Engineer | *Visvaraj Infrastructure Limited, Nagpur, India*
June 2014 - May 2014

ORGANISATIONAL ACTIVITIES

- Created the facility for Heating of Bituminous Pavements using the Induction heating technology. Designed, Customized, Indented, Procured and Commissioned the facility at CSIR-CRRI
- Part of Organising committee of the of the international conference on Pavements and Computational Approaches (ICOPAC-2018) at Central Road Research Institute, New Delhi on 13th and 14th November 2018
- Faculty Member for the regular training program of CSIR-CRRI which includes an international course for Dissemination of HDM 4, Pavement Evaluation Techniques, runway evaluation techniques for Air Field pavements etc.
- Part of technical purchase committee for procurement of capital items at CSIR CRRI.
- Organised various workshops/seminars at CSIR CRRI
- Part of drafting committee for the white paper on the 'Feasibility study on the application of self-healing technologies for the pavements in India' by TIFAC from 2021 to 2023.

PROJECTS AT CRRI

Sl. No.	Title of Project	Sponsoring Agency	Your Role
1	Development of Induction Based Self-Healing Pavements	CSIR-CRRI	PI
2	Water Harvesting Using Porous Flexible Pavements	CSIR-CRRI	PI
3	Development of Pavement Deterioration Models for High Altitude Low Volume Roads	CSIR-CRRI	PI

Sl. No.	Title of Project	Sponsoring Agency	Your Role
4	Quantitative assessment of milling induced structural changes in asphalt pavements for improved overlay design	CSIR	PI
6	Failure investigation of Bhopal-Biaora section of NH-12 from Mubarakhpur to Biaora package-II (km. 324.000 to km. 423.000) in the state of Madhya Pradesh and its remedial measures	NHAI	PI
7	Impact of road roughness on energy consumption of electric vehicles (EVS)	CSIR	Co-PI
8	Facility Creation for Setting Up State-of-the-Art Equipment in CRRI	CSIR	Team Member
9	Study of Decay in Modulus of Stabilized Layers in Flexible Pavements	UP PWD	Team Member
10	Pilot Study on Evaluation of Dust Suppressant for Control of Road Dust Emissions	Nitto Denko, Japan	PI
11	Evaluation of Four New Delhi Municipal Roads for Milling and Redesign	NDMC	PI
12	Evaluation of Delhi PWD Roads (GTB Nagar, Capt. Jawed Ali Marg, and Seemapuri) for Milling and Strengthening	PWD Delhi	PI
13	Calibration of Fifth Wheel Bump Integrator Serial No. CAMBI-28 using Dipstick	STECO Instruments Ltd.,	PI
14	Calibration of Fifth Wheel Bump Integrator Serial No. Jaisa 21 using Dipstick	JAISA Ltd.,	PI
15	Calibration of Fifth Wheel Bump Integrator Serial No. STECO 265 using Dipstick	STECO Instruments Ltd.,	PI
16	Evaluation of Gandhinagar Delhi PWD Road for Milling	PWD Delhi	PI
17	Evaluation of Delhi PWD Road (East Road Division) for Possible Milling and Strengthening	PWD Delhi	PI
18	Calibration of Fifth Wheel Bump Integrator Serial No. STECO 374, 375, 376, and 377 using Dipstick	STECO Instruments Ltd.	PI
19	Demonstration & Quality Audit for Using New Technology for Recycling of Pavement Material	UP PWD	Team Member
20	Evaluation of Roughness Index Using Laser Profilometer on Agra-Lucknow Expressway	PNC Infratech,	Team Member

Sl. No.	Title of Project	Sponsoring Agency	Your Role
21	Geotechnical Investigations and Pavement Design for Baabani-Khamadi Road	Himachal Pradesh PWD,	Team Member
22	Geo-Technical Investigations for UER-II Road Construction in Delhi	DDA,	Team Member
23	Quality Supervision for Construction of Inner Ring Road in Agra	Agra Development Authority,	Team Member
24	Improvement and Strengthening of Road Network in and around Kolkata Port	Kolkata Port Trust	Team Member
25	Assessment of Odisha Road Network	Odisha PWD,	Team Member
26	Modern Data Collection Techniques for Asset Management of Odisha PWD Roads	Odisha PWD,	Team Member
27	Evaluation and Quality Assurance of Resurfacing Work at Hero MotoCorp Plant, Gurugram	Hero MotoCorp,	Team Member
28	Calibration of Fifth Wheel Bump Integrator Serial No. 16168 and 16169 using Dipstick	STECO Instruments Ltd.,	Team Member
29	Calibration of Fifth Wheel Bump Integrator Serial No. Jaisa 16 using Dipstick	JAISA Ltd.,	Team Member
30	Customised Training Program on Airfield Engineering for BRO Officers	BRO,	Team Member
31	Road Inventory and Pavement Condition Survey for Asset Management of Odisha Rural Roads	Odisha PWD,	Team Member
32	Development of Airport Pavement Management System for 10 Airports in India	Airport Authority of India,	Team Member
33	Evaluation of Firoz Shah and Ashoka Roads for Cold Milling Process and Overlay Recommendations	NDMC,	Team Member
34	Calibration of CAMBI Serial No. 1 using Dipstick	STECO Instruments Ltd.,	Team Member

PROJECTS HANDLED AS PAVEMENT DESIGN ENGINEER

- Pavement design, traffic analysis and economic analysis using HDM for “Consultancy services for a feasibility study, detailed project report, survey & preparation of land plan schedules for widening to two/four lane with paved shoulders of Meerut-Najibabad road in the state of Uttar Pradesh on EPC mode”.
- Pavement design, traffic analysis and economic analysis using HDM- for “Consultancy services for feasibility study, detailed project report for widening to

two/four lane with paved shoulders from km 0.000 to km 74.000 of NH-365 on Kodad-Khammam-Kurvi road in the state of Telangana”

- Development of Pavement Management System and Life Cycle Cost Analysis for rural roads for three districts of Telangana.
- Execution of punch list of Warora Chandrapur Ballarpur four laning State highway Anchoring on-site construction activities to ensure completion of the project within the time & cost parameters and effective resource utilization to maximize the output

PUBLICATIONS

S. K. Pasupunuri, D. Tiwari, P. Kumar, S. Jain. (2017). “Self- healing pavements: A revolution in pavement materials” Proceedings of International Road Federation, World Road Meeting 2017, Nov 14-17

S.K. Pasupunuri, N. Thom, L. Li, Use of Machine Learning Algorithms for Predicting the Transverse Cracking in Jointed Plain Concrete Pavements, in: Airfield and Highway Pavements 2023, American Society of Civil Engineers, Reston, VA, 2023: pp. 172–184. <https://doi.org/10.1061/9780784484906.016>.

S. T. Ramachandraiah, P. Kumar., S. K. Pasupunuri, J. R. Shinganmakki (2023). Evaluation of pavement surface distress using image processing and artificial neural network. *Journal of Testing and Evaluation*, **51**(1), 123-134. <https://doi.org/10.1520/JTE20220121>

S.K. Pasupunuri, N. Thom, L. Li., Roughness prediction of jointed plain concrete pavement using physics-informed neural networks. *Transportation Research Record: Journal of the Transportation Research Board*, **2678**(5), 456-468. <https://doi.org/10.1177/0361198124102578>

S.K. Pasupunuri, N. Thom, L. Li., Development of a High-Performance Extreme Gradient Boost Model for Predicting Faulting in Jointed Plain Concrete Pavements. *Int. J. Pavement Res. Technol.* (2025). <https://doi.org/10.1007/s42947-025-00510-x>

M. Z. Pradana, T. Sutoyo, T. Sudibyo, S. K. Pasupunuri. (2024). Evaluation of Bogor station area based on transit-oriented development (TOD) principles. Presented at The 3rd International Seminar on Civil and Environmental Engineering (ISCEE) 2024: Innovative Infrastructure for Sustainable Environmental Development, E-Conference, September 5-7, 2024.

CONFERENCES

S. K. Pasupunuri, N. Thom, Development of Deterioration Models for Concrete Pavement, 12th International Conference on Concrete Pavements organised by International Concrete Pavement Society, September 27 - October, 2021 (online)

S.K. Pasupunuri, N. Thom, L. Li , Predicting Concrete Pavement Deterioration, Britpave Conference, Oxford, October 2022

S.K. Pasupunuri, N. Thom, L. Li, Development of Prediction Models for Concrete Pavements, 1st PhD conference by National Highways, Birmingham UK, June 2023

S.K. Pasupunuri, N. Thom, L. Li, Use of Machine Learning Algorithms for Predicting the Transverse Cracking in Jointed Plain Concrete Pavements 'ASCE International Conference on Transportation and Development', Austin USA, June 2023

A.Gupta, S. Gowda, S. K. Pasupunuri,. Prediction of modified structural number for asphalt pavements using machine learning algorithms. Presented at the Transport Research Board (TRB) Annual Meeting 2024, Washington, D.C.

S. Gowda, N. C. S. Nandan, M. A. Jayaram, A. Gupta, S. K. Pasupunuri, J. R. Shinganamkki, (2024). Machine learning-based ensemble techniques for optimal prediction of pavement condition. Presented at the Transport Research Board (TRB) Annual Meeting 2024, Washington, D.C.

M. Z. Pradana, T. Sutoyo, T. Sudibyo, S. K. Pasupunuri. (2024). Evaluation of Bogor station area based on transit-oriented development (TOD) principles. Presented at The 3rd International Seminar on Civil and Environmental Engineering (ISCEE) 2024: Innovative Infrastructure for Sustainable Environmental Development, E-Conference, September 5-7, 2024.