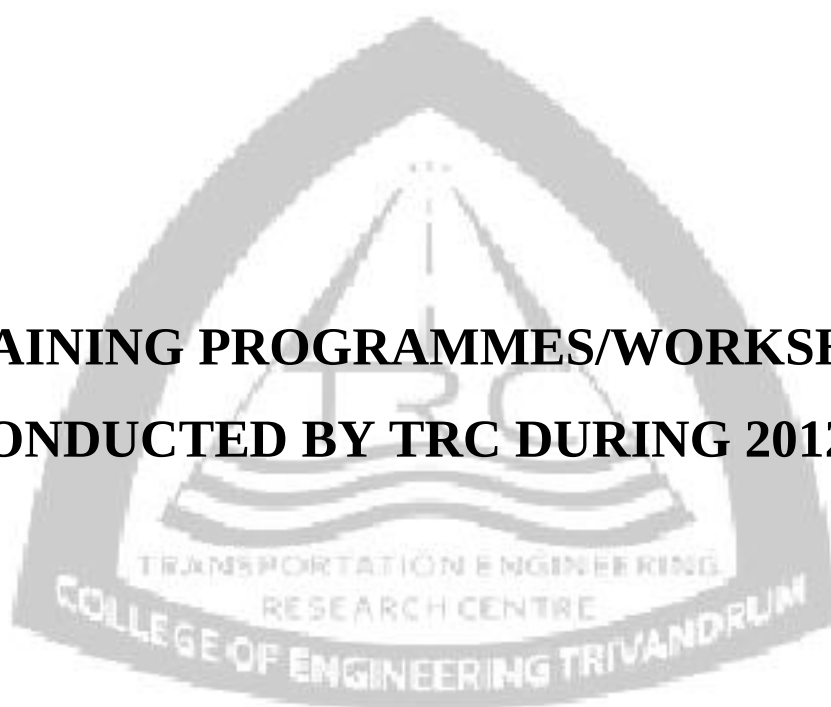


**TRAINING PROGRAMMES/WORKSHOPS
CONDUCTED BY TRC DURING 2012-2025**



1. Training on “Design, Construction and Maintenance of Roads of Kerala”

This training was conducted by Dr. Binu Sara Mathew and Prof. Leema Peter on 17th and 18th August 2012 at College of Engineering Trivandrum on “Design, Construction and Maintenance of Roads of Kerala”. The objective of the programme was laying a stepping stone towards fulfilling the mission of TRC of “building better roads for Kerala”.



Inauguration of the Programme

Resource persons for the programme included Dr. A . Veeraragavan, Dr. Kuncheria P. Isaac, Dr. K. Balan, Prof. Anil and Dr. Binu Sara Mathew. The topics covered included, Material Characterisation, Ground Improvement Techniques, Pavement Design, Subgrade and Granular Layers, Construction and Quality Control, Management and Maintenance of pavements. The detailed schedule of the programme is attached herewith. The programme was attended by sixty engineers, of which forty eight were from PWD and two faculties from private engineering colleges and ten faculties from CET.



Lecture by Dr. K. Balan on “Ground Improvement Techniques”



Lecture by Dr. Kuncheria P. Isaac on “Sub Grade and Granular Layers”



Valedictory Session of the Programme

The participants interacted well with the experts and the programme was well appreciated by all the participants.

2. Training on “Road Safety Engineering”

The Training course conducted by Dr. Ashalatha. R and Prof. Preethi. P on 27th to 29th September 2012 on “Road Safety Engineering” at College of Engineering Trivandrum in association with Kerala State Public Works Department. The number of road accident fatalities has been growing in recent years in our State which calls for concerted and multidisciplinary preventive and remedial efforts. Having realized the gravity of the situation, it was decided to conduct the course. The Engineers from various Govt. departments viz. PWD, Town planning,

KSTP, NATPAC and those from academic institutions and consultancies like TRDCL participated in the programme.

The course was inaugurated by Dr. S. Gangopadhyay, Director, Central Road Research Institute, New Delhi on 27th September 2012. Prof. Jyothis Thomas, Head of the Department of Civil Engineering welcomed the gathering. The function was presided over by Prof. (Dr.) V. Gopakumar, Principal, College of Engineering Trivandrum. Er. Baburaj, Chief Engineer (Roads and Bridges), Kerala PWD and Prof. R.Satheesh Chandran, Coordinator, Transportation Research Center delivered the felicitations. In his key note address the chief guest pointed out the relevance of the topic in the current scenario and how to incorporate safety features in the road design.

One of the renowned experts on road safety in India, Prof. (Dr.) P. K. Sikdar, Former Director, Central Road Research Institute and currently President Inter-continental Consultants and Technocrats NewDelhi, explained to the participants the importance of road safety audit and procedures involved in it. A Road safety audit of Vetturoad junction near Kazhakoottam was also carried out under his guidance. Sri. Senkumar IPS, ADGP (Intelligence) and Former Transport Commissioner Kerala, discussed the issues of road safety in Kerala in its various aspects. He pointed out the bold initiatives taken by the Kerala Government in formulating Road Safety Authority for the State, the first of its kind in India. Sri. Anil Pandala, Project Director, Thiruvananthapuram Road Development Company Limited explained the impediments to the activities for improving road safety in Kerala. The faculty members of the Transportation Engineering Division, Department of Civil Engineering, also delivered lectures on various engineering aspects relating to road safety. The valedictory function was presided over by Prof. Valsala, P.G. Dean, CET. Er. Sundaran, Chief Engineer (Design and Administration), Kerala PWD distributed the certificates to the participants. Dr. Ashalatha .R, and Ms. Preethi. P, faculty members of the Department of Civil Engineering, and Er. Ablemon, Assistant Engineer, KPWD road safety wing were the co-ordinators of the course.



Inauguration of the course on “Road Safety Engineering”

3. Training on “Applications of Advanced Technology in Construction & Performance Monitoring of Pavements”.

This training course was conducted by Dr. R Padmakumar on 4th November 2013 at College of Engineering Trivandrum on “Applications of Advanced Technology in Construction & Performance Monitoring of Pavements”. The objective of the programme was laying a stepping stone towards fulfilling the mission of TRC of “building better roads for Kerala”.



Inauguration of the Programme

Resource persons for the programme included Prof. Anil.R, Dr. Binu Sara Mathew & Prof. Loui.T.R on “Interlocking Concrete Block Pavements”, “Design and Construction aspects of Flexible Pavement” & “Application of Geo textiles on Pavement” respectively. The programme was attended by sixty engineers, of which forty eight were from PWD and two faculties from private engineering colleges and ten faculties from CET.



A talk on Interlocking Concrete Block Pavements by Prof. Anil R



A talk on Application of Geo textiles on Pavement by Prof. Loui T R



A talk on Design and Construction aspects of Pavement by Dr. Binu Sara Mathew

4. Training on “Design Construction And Maintenance Of Rural Roads”

This training course conducted by Dr. M Satyakumar On November 21st, 22nd and 23rd 2013 on “Design Construction And Maintenance Of Rural Roads” at College of Engineering Trivandrum in association with Kerala State Public Works Department.



The inauguration & inaugural address was given by Prof B P Chandrashekar, Technical advisor, APSRRDA who lighted the lamp and declared it open.

After the inaugural function, a general perspective on PMGSY was given by Prof. B P Chandrashekar who later detailed on the guide lines of PMGSY. Thus a brief idea was shared by him on the different aspects and activities of PMGSY.



A talk on preparation of DPR by M.V.L.R Anjaneyulu on the second day of Design construction and maintenance of rural roads

The valedictory function started with the welcome speech by Dr. V Syamprakash HOD civil department. The distribution of certificates was later held by P.R Sajikumar, Chief Engineer, LSGD. The function came to an end with vote of thanks by Dr. M Satyakumar.

5. Training on “Recent Trends in Pavement Condition Evaluation and Construction”

As a part of the activities of Transportation Research Centre (TRC), a training course including technical exhibition on **“Recent Trends in Pavement Condition Evaluation and Construction”** was coordinated by Dr. R. Priya, Associate Professor, Department of Civil

Engineering, and College of Engineering Trivandrum in association with Kerala Highway Research Institute from December 17th to December 19th. The workshop was coordinated with an objective to offer a platform for disseminating the new trends in ground improvement techniques, recent innovations in material testing, advanced equipment in pavement construction and pavement condition evaluation, quality assurance in pavement construction, data acquisition and transfer equipment and transportation safety systems. This endeavour gave an opportunity for the professionals in transportation engineering, to get acquainted with the recent innovations in the field. Along with the technical sessions, a technical Exhibition was also arranged.



Three day technical exhibition and workshop was inaugurated by Sri. T. O. Sooraj IAS, Secretary, Public Works Department

The meeting was presided over by Dr. J. Letha, Director of Technical Education. Dr. S. Sheela gave the welcome address. Prof. Satheesh Chandran, Co-ordinator, TRC gave a brief overview about the course schedule. Prof. Joisy M.B., Head of Department of Civil Engineering, proposed vote of thanks.

About 150 delegates from government organisations such as PWD (21), PMGSY (9), LSGD (28). KSRRDA (1) , and faculty from academic Institutions (24), Industry persons (12) and Project staff and lab instructors (3) and post graduate students in Transportation Engineering(42).



Recycling technique for rehabilitation of highway pavements, Prof. A. Veeraragavan, Indian Institute of Technology, Madras.



Quality Control/Quality Assurance, Dr. R. Priya, Associate Professor, Department of Civil engineering, College of Engineering, Trivandrum

Technical exhibitions: The following companies had put up their stalls in the venue for the advertisement and promotion of their products. The role of these exhibits was great in the success of this programme.



Coir board Stall



RAMCO Cements Stall

6. Training on “Innovations in Urban Transport Infrastructure (IUTI)”

The training course was conducted by Dr. Manju V.S, Associate Professor, and Prof. Anu P Alex On 22nd -24th January 2014 on **“Innovations in Urban Transport Infrastructure (IUTI)”** at College of Engineering Trivandrum in association with Kerala State Public Works Department.

The course was inaugurated on 22nd January 2014 by Dr. E. Sreedharan, Former Managing Director of Delhi Metro Rail Corporation (DMRC) & Principal Advisor of Kochi Metro Rail. Dr.S. Sheela, Principal, College of Engineering Trivandrum presided over the function. Prof. M.B. Joisy, Head of Department of Civil Engineering, Prof. R.Satheesh Chandran, Co-ordinator of TRC and Dr. Manju.V.S, the programme co-ordinator also spoke at the function. Later, Dr. E. Sreedharan delivered the keynote address. The inauguration and the key note address was attended by more than 600 people, which included sixth semester B.Tech Civil Engineering students, PG students from Civil and Architecture department and faculty members from Civil and all other departments.



Inauguration by Dr. E Sreedharan

7. Training on "Design, Construction and Maintenance of Roads"

The course was on "Design, Construction and Maintenance of Roads" from 7th to 9th January 2015 for Engineers from PWD/LSGD and faculty and students. It was coordinated by Dr. Binu Sara Mathew and Dr. Sheela Alex. About 40 faculty members, two Research Scholars and 36 PG Students attended this program.



Inauguration of the Programme

Resource persons for the programme included Dr. Animesh Das , Professor, Indian Institute of Technology Kanpur, Prof.. K. Balan, Department of Civil Engineering, College of Engineering Trivandrum, Ms. Salini P., Scientist, National Transportation Planning and Research Centre (NATPAC), Prof. M. Satyakumar Department of Civil Engineering, College of Engineering Trivandrum, Dr. Binu Sara Mathew , Associate Professor, Department of Civil Engineering, College of Engineering Trivandrum.



Presentation by Dr. K. Balan on Relevance of Subsoil Investigation



Presentation by Salini, Scientist, NATPAC on Pavement Materials, Tests and Characterisation



Presentation by Dr. M. Satyakumar on Marshall Mix Design



Presentation by Dr. Animesh Das, IIT Kanpur on Principles of Pavement Design



Presentation by Dr. Binu Sara Mathew on Flexible Pavement Design



Presentation by Dr. Samson Mathew on Pavement Construction and Quality Control

8. Training on “Geographical Information System and its application in Pavement Maintenance Management”

Another three day training programme on “Geographical Information System and its application in Pavement Maintenance Management” was conducted from 12th to 14th January 2015 for Engineers from PWD and faculty members and students. The course was coordinated by Dr. M. Satyakumar and Dr. R. Priya. Hands on training on Geomedia Professional and Geomedia Transportation Manager was done by Geotech Geospatial Pvt., Ltd, (Intergraph) Company. About 40 participants attended this training programme.

The first day the first session was engaged by Prof. M. Sathyakumar, Professor, Department of Civil Engineering, College of Engineering Trivandrum on district rural road planning.



A Presentation by Prof. Satyakumar on District Rural Road Planning



Presentation by Dr. Priya on Pavement Management System



Prof. Satyakumar M., Er. Sajikumar, Chief Engineer, PMGSY handed over the certificate to Geo Media team

The valedictory function was attended by Er. Sajikumar, Chief Engineer, PMGSY. The distribution of certificates was done by Prof. S. Sheela, Principal, College of Engineering Trivandrum. The function came to an end with vote of thanks by Dr. Priya.

9. Training on “VISSIM software”

Two day training programme on VISSIM software was conducted for the benefits of post graduate students and research scholars from 2nd to 3rd February 2015 by Dr. Ashalatha R. About 30 participants including research scholars, post graduate students and faculty members attended this training programme. Hands-on training was given to all the participants.



Valedictory: Training on VISSIM by Manraj Singh Bains (PTV Vision)

10. Training programme on “Material Characterization, Mix design and Pavement Evaluation”

Dr. Priya R and Prof. Loui TR coordinated a the short term training programme with financial help of Transportation Engineering Research Centre (TRC) during the period of 18-01-2016 to 22-01-2016 (5 days).The course was intended for practicing engineers of various govt. organizations like PWD, Harbour Engineering, LSGD,NATPAC etc., and also faculty members from Engineering Colleges. The course was scheduled for a period of 5 days from 18-01-2016 to 22-01-2016 and was inaugurated by the Principal, Dr. J. David,.

The objectives of the course were:

1. Create awareness about the importance of material characterization and testing methods available at present scenario.
2. Introduce the latest methods and concepts of pavement design and related aspects.
3. Introduce the latest state of the art techniques and instruments available for pavement evaluation.



Technical talks were delivered by Dr. K Balan (Subsoil Investigation and Laboratory Testing of Soil for Highways) ,.Prof. Loui T R (Deflection Measurement and Design of Overlays), Dr.R.Padmakumar (Material Characterization on Aggregates and Bitumen),.Dr.Jeenu G, (Concrete Mix Design), Prof.Anil R(Design of Bituminous Mixes) Dr. R Priya(quality

checking during construction, Roughness Measurement of Pavement) ,Dr. B B Pandey of IIT Kharagpur took detailed class on (Design and Construction Issues of Flexible Pavement and Cement concrete Pavements) Dr. Martin Payyappilly, (Stress Management).



Dr. ShyamSunder (Health Issues and Remedies), Antonpaar-the distributors of testing equipments (sophisticated instruments/equipments available for testing of bitumen, bituminous mixes) also delivered talks. Lab (testing of materials,Mix Design) and field sessions (Benkelman Beam Deflection, Fifth Wheel Bump Integrator and MERLIN, Roughometer III) were organized to give hands-on training to participants, with special support from Prof. Abhijith R, Marian Engg College. Participants from various institutions actively participated in the class, apart from faculties of CET. All the participants opined that it was useful and fruitful course. They all suggested to conduct this type of courses in future so as to help the service engineers to update knowhow and hence improve the quality of service.



11. Symposium on "Bridging the Gap: Theory and Practice in Pavement Engineering (23rd Jan 2016)"

In order to ensure the dissemination and implementation of innovative research outputs in road sector, TRC organized a brain storming session, a One day Symposium on "Bridging the Gap: Theory and Practice in Pavement Engineering "for practicing engineers, consultants and contractors. The symposium was meant to throw light on the recent innovations in the field through deliberations of and interaction with renowned experts in Pavement Engineering. The first TRC newsletter depicting the research activities of TRC over the past three years was released by Prof. B. B. Pandey during this programme.



Releasing of TRC news letter by Prof. B. B. Pandey





The experts who led the symposium included Prof. B. B. Pandey, Advisor, Sponsored Research and Industrial Consultancy and former Professor and Head, Dept. of Civil Engineering, IIT, Kharagpur, Shri. Bongirwar, Former Principal Secretary, PWD, Maharashtra and Dr. A. Veeraragavan, Professor, I.I.T, Madras. The programme had an overwhelming response and a total of 90 participants including about 50 engineers from State Government departments/Consultancy Services and Academia, research scholars and post graduate students attended the programme. The topics of discussion included revisions included in the latest codes of practice for design of flexible and rigid pavements, construction of roads at affordable cost, innovative pavements and importance of maintaining quality control in construction of pavements. The need of adoption of innovative and sustainable materials like Recycled Asphalt Pavement materials, modified binders and adapting to new construction practices were emphasized in the programme. During the interactive session with the experts, the engineers shared various types of issues and challenges confronted by them in the field and the experts discussed the issues in detail and suggested possible solutions for them. The theme and conduct of the symposium was well appreciated by the participants.

12. Symposium on “Road Safety: Mission Towards Safer Roads”

The one-day symposium was held at College of Engineering Trivandrum, organised by Transportation Engineering Research Centre (TRC). Delegates from PWD, RSA, MVD, VicRoads, KSTP, National Highways, NATPAC, and educational institutions participated in the symposium. Dr.B.G. Sreedevi, Director, NATPAC inaugurated the symposium. Prof. (Dr) P.K. Sikdar, Former Director of CRRI and President, Intercontinental Consultants and Technocrats Pvt. Ltd (ICT) delivered a Keynote Address on “Issues and Challenges” and urged the audience to follow approach by Sweden, Japan and New Zealand in road safety matters. He emphasized on a safe system approach. Prof. Dr. J .David, Principal, CET presided over the function. Dr. R.Padmakumar, coordinator of symposium welcomed the dignitaries and delegates, Dr. Ashalatha .R, Coordinator TRC gave an overview of TRC and it’s activities, Prof. Preethi P.,coordinator of symposium presented an overview of the symposium and its objectives. Prof. Jyothis Thomas, Dean P.G. studies and Dr. P.G. Jairaj, Professor and Head of Civil Engineering Department delivered felicitations. Prof. Salini S, coordinator of the symposium delivered the vote of thanks.



A technical session then followed. Mr. Jim Jarvis, Team Leader, Vic Roads presented “An Institutional Framework to support coordination of Road Safety Activity”, and discussed a safe corridor demonstration program. Mr. P.M. Shaji, Assistant Transport Commissioner and Mr. Mahesh delivered a talk on Kerala Road Safety Authority and projects under Motor Vehicles Department. Mr. Tony Mathew, Vice President, ICT, delivered a talk on “Designing for safety”, emphasizing on a proactive approach and use of advanced signs and marking concepts. The afternoon session began with a session on Enforcement and Education. Mr. Muhammed Najeeb, Cochin Metro Ltd. presented concept and technical details of enforcement. Mr. B.Zubin (NATPAC) presented the importance of Road Safety Education. There was a very good response from the audience in the form of queries on different aspects.



A panel discussion was held in the afternoon to address various issues in road safety and to formulate guidelines for research and development aimed at safer roads. Dr. P.K.Sikdar moderated the discussion in which himself, Mr. Tony Mathew, Mr. Jim Jarvis of Vic Roads, Er. Anil N T. Executive Engineer, Road safety cell, PWD, Er. L Beena(EE, KSTP), Mr. Aravaind (NGO, CanWalk) and Dr. R. Padmakumar expressed their views in the symposium, with active participation from the audience. A report was prepared based on panel discussion and submitted to the Government and stake holders.

13. National Symposium on “Geotechnical Aspects of Pavement Structures”

A three day National Symposium on “Geotechnical Aspects of Pavement Structures” sponsored by TRC College of Engineering Trivandrum was co-ordinated by Department of Civil Engineering, CET and Department of Civil Engineering, Govt Engineering College

Bartonhill. The venue of the symposium was Zoom IT Hall, Govt. Engineering College Bartonhill, Thiruvananthapuram. The event was conducted during 23-25th January 2017.

The registration for the symposium started at Zoom IT Hall, GECBH on 23rd January 2017 at 9.00am. Dr. Jaya V, one of the organising secretary of the symposium welcomed the gathering. The inaugural function was commenced at 9.30am and Dr. Shaji Senadhipan, Principal, GECBH inaugurated the symposium and delivered an informative inaugural address. Dr. K. Balan, President IGS Trivandrum chapter, Dr. K. Jairaj, HOD, Department of Civil Engineering CET and Prof. (Rtd.) Rajendrababu were felicitated for the programme. The technical lectures were delivered by eminent professors and practising engineers in the area of pavements and related structures.

The source persons for the symposium are as follows:

1. Dr. K. Balan (Rtd. Prof., CET), President IGS Trivandrum Chapter
2. Dr. Satyakumar M (Rtd. Prof., CET) HOD, Dept of Civil Engg, MBCET
3. Dr. Sheela Evangelene, Prof, CET
4. Mrs. Salini U, Scientist, NATPAC
5. Dr. Jaya Mohan J, Principal LBSITW
6. Dr. Shivsankar, Prof. NIT Surakkal
7. Er. Anwar, Meccafferi

There were 50 participants from engineering colleges, govt. departments and practising engineers.



Welcome speech by Dr. Jaya V, HOD, Dept. Of Civil Engg. GECBH (23/01/2017)



Dr. Jairaj, HOD, Dept. Of Civil Engg. CET (23/01/2017)



Session 1 by Dr. K. Balan (23/01/2017)



Session 4 and 5 by Mr. Anwar, Meccaferi and exhibition of geotextiles (24/01/2017)



Session6 by Sr.SaliniU, NATPAC(24/01/2017)



Session 7 by Dr.Sheela Evangelene,CET(24/01/2017)



Session8 by Dr.JayaMohanJ,Principal,LBSITW(25/01/2017)



Session 9 by Dr.Shivsankar, Prof NIT Surakkal (25/01/2017)



Valedictory address by Dr.PadmakumarR,TRC co-ordinator (25/01/2017)

There was an interactive session during which the participants interacted with the experts regarding problems encountered in the field. A feedback session was also arranged during valedictory and the symposium was well appreciated by the participants.

14. Workshop on "Real Time Applications of Intelligent Transportation Systems (RAITS 2018)"

A three-day workshop on "*Real Time Applications of Intelligent Transportation Systems (RAITS 2018)*" sponsored by Transportation Engineering Research Centre, was organized during 12th to 14th December 2018 at CET to address various issues pertaining to adaptive traffic control and intelligent operation of vehicles. Dr. R. Padmakumar, Dr. Anusha S P and Dr. Sheela Alex jointly coordinated this workshop. The workshop was aimed at bringing industry and academia on a common platform and to deliberate on the challenges and issues therein. There were 20 participants for the workshop. Dr. M. S. Girish, Professor and Head of the Department and Coordinator, TRC welcomed the gathering. RAITS 2018 was formally inaugurated by Dr. Jiji C V, Principal-in-charge of CET, on 12th December 2018 at Seminar hall II, Department of Civil Engineering. Dr. Padmakumar gave a briefing about the workshop to the participants and Dr. Anusha S. P. proposed vote of thanks.



The first two sessions of first day were handled by Dr. P. Ravikumar, Associate Director, C-DAC, Thiruvananthapuram on **ITS applications in adaptive traffic control**. The session was highly interactive. The afternoon sessions were taken by Dr. Anil R, Associate Professor on **Emergency information system using ITS** and Dr. R. Padmakumar on **Avenues for ITS based research in TRC**.



The second day was dedicated to **Real-time applications of ITS in adaptive traffic control**, with the technical sessions and subsequent demonstration handled by Mr. Rajesh Gogineni, ITS Planners and Engineers Ltd.. Application of the tools, Traffic Intelligence Module and Server also were demonstrated.

The first session of third day in forenoon was engaged by Dr. Anusha S P on **ITS case studies**. The subsequent sessions were handled by Dr. V. Lelitha Devi, Professor of IIT Madras on **Fundamental principles of ITS, ITS applications, Loop detectors and similar practical issues in data acquisition**. There was a brief valedictory session following the technical sessions, during which Dr. Lelitha Devi presented certificates to participants. Participants gave feedback that the workshop was useful and the theme was the need of the hour.



15. Training programme on “Advanced Course on Applications of CUBE Compact”

A five day training programme on ‘**Advanced Course on Applications of CUBE Compact**’ sponsored by the Transportation Engineering Research Center (TRC) was conducted during 11/03/2019 to 15/03/2019 at CET. Dr. Manju V.S. and Dr. Anu P. Alex were the coordinators. There were 40 participants, including Post graduate students from Traffic and Transportation Engineering and Geo informatics streams and faculty members of Dept. of Civil Engineering of CET.

Ms. Lila Parakkunnathu Chandrabhanu, representative from M/s. Transportation Planning and Research, the supplier of the software, conducted the training on all the five days successfully. She introduced the basic functions of CUBE software, creating, editing and analyzing roadway network, adding Traffic Analysis Zones, public transit editing and analysis, data file management in CUBE, basics of scripting, the four stages planning modeling viz; trip generation, distribution, traffic assignment and mode choice, and scenario analysis. She also shared her experience on working with Bangalore Metro Rail Corporation.



The training programme was well appreciated by all the participants, and gave feed back that training programmes of this sort will surely help them to get to know about the innovations in transportation sector.

16. Symposium on “Research to Practice- Towards better roads”

The One-day Symposium on ‘Research to Practice- Towards better roads’ was held at Civil Engineering Seminar hall II, College of Engineering Trivandrum on 18th January 2020. The inaugural programme commenced with the welcome address by Dr. Jiji C.V., Principal, College of Engineering Trivandrum. The symposium was inaugurated by Shri. K.R. Jyothish, IAS Principal Secretary- Transport, Government of Kerala.



The inaugural function



Release of Traffic Management Scheme for CET campus by Dr. JiJi C.V., Principal, CET



View of the audience during the inauguration

Dr. K.P. Indira, Director of Technical Education delivered the presidential address. Dr. Binu Sara Mathew, Co-coordinator, TRC presented an overview about the research activities of TRC during 2012-2020 and Dr. Ashalatha R., Coordinator of the Symposium highlighted the importance of the symposium in the context of TRC and its expected outcomes. Dr. K.P. Isaac, Vice Chancellor, Hindustan University and Dr. Samson Mathew, Director, NATPAC graced the inaugural programme of the Symposium. The inaugural function concluded with the vote of thanks by Dr. Mini Soman, Coordinator TRC, Head of the Department of Civil Engineering.

Following the inaugural programme, presentations of major TRC projects which were implemented in the field were made by the respective principal investigators. It was followed by a technical session (9.45 am -11.45 am) **“Challenges Faced in Pavement Construction, Traffic Operations and Management”** which was chaired by Dr. A Veeraragavan, Professor, I.I.T Madras and Co-chaired by Dr. Samson Mathew, Director NATPAC.

The following were the themes of the technical sessions:

- Pavement Design, Construction and Maintenance Management
- Enhancing Road Safety
- Traffic Management in Cities

The participants from various stakeholders presented their issues and problems which TRC could take up as research projects and give their technical inputs.

Representatives from various stakeholder organisations like Kerala PWD, KHRI, KSRRDA, CDAC, TRIDA, NATPAC, KIIFB, LS GD etc. were present. Er. Beena L., Chief Engineer-Roads started the discussion and presented in a nutshell the various problems and the

challenges confronted by engineers in the field. It was followed by presentations by representatives from various organisations on their issues and sought TRC's guidance to find a fruitful and practical solution to the various field problems. Dr. Veeraragavan the session chair gave the concluding remarks. He also identified the research areas under each theme which TRC could take up and also outlined in details and how TRC is expected to move forward and what should be the deliverables.

In the afternoon session, Dr. A. Veeraragavan, Professor, IIT Madras, gave a lecture on **Construction of Long Lasting Pavements**. It was followed by an interactive session with the participants. Dr. Veeraragavan consolidated the issues in pavement construction, performance and maintenance. The key areas in pavement sector, where research is to be pursued and innovative interventions are required so as to overcome the limitations in the conventional practices were also highlighted by Dr. Veeraragavan in this session. It was followed by a lecture by Dr. Sreedevi B. G. on Road Safety – Vision 2020.

About 80 participants from various stakeholder agencies/research organisations, research scholars and post graduate students and faculty members from CET attended the Symposium. The recommendations for carrying out research under various themes were compiled for consideration of TRC members for initiating collaborative research and the authorities for taking congenial attitude towards implementation of the same on the roads of Kerala.

17. International Conference on “Innovative Methods and Practical Applications for Cognizant Transportation Systems (IMPACTS2023)”

This is the first international conference organised by TRC. The conference was conducted in association with CTR, NIT Calicut and KSCSTE-NATPAC. The conference IMPACTS 2023 was scheduled for 3 days from 20 to 22 March 2023 and conducted at College of Engineering Trivandrum.. The conference was inaugurated by the honourable Chief Secretary of Government of Kerala, Dr. V P Joy, IAS on 20.03.2023.

Six themes were identified for the conference and papers were called for. 75 papers were received, out of which 2 were desk rejected. The other papers underwent double blind review and 65 papers were selected for presentation. The papers received were categorised into three tracks, 17 in track A, 25 in track B 23 in track C. Authors of 60 papers registered and 57 papers

were presented at the conference. The authors of best papers in the three tracks were honoured at the valedictory session. These papers were presented and deliberated upon in parallel sessions during these 3 days in the AN. Select papers from the conference which pass the quality check will be published by Springer as a proceedings book volume.

Besides paper presentation there were 6 key note addresses in the FN session from renowned experts from India and abroad. There were also technical sessions handled by the sponsors from industry in the FN itself.

In the AN, paper presentations were held in 3 separate venues. The sessions were chaired by experts from IIT, NIT, research organisations etc. In the AN, there were also technical talk by experts from IIT, NIT etc., which was mainly meant for practising engineers.

Moreover, exhibition stalls were also set up by sponsors which was widely appreciated. The conference was attended by more than 180 delegates, which includes faculty, researchers, students from IIT, NIT, delegates from industries, research organisations, practicing engineers and delegates from the organizing institutes.



18. Training Programme on “Adaptive Designs and Applications in Pavement Technology & Safety (ADAPTS 2023)”

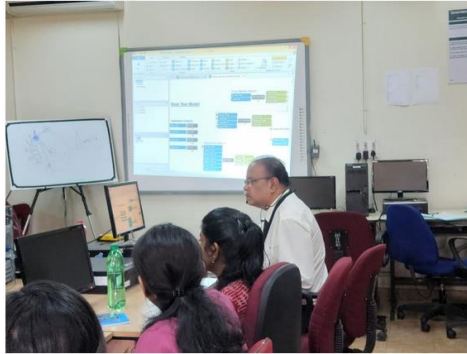
With an aim to bring together industry and academia on the same platform, a Training Programme Adaptive Designs & Applications in Pavement Technology & Safety (ADAPTS 2023) was conducted on 23 to 24 January 2023, for implementing agencies like PWD, KRFB, KSSRDA, LSGD etc. under the auspice of Transportation Engineering Research Centre (TRC), CET. 49 participants registered for the course out of which 39 external delegates participated in the training programme (excluding M.Tech. students, research scholars and internal faculty members). Total number of registered participants was 65.



The programme intended to impart insight in to challenges and adaptive solutions to pavement design, quality control during construction, hands on training of IITPAVE design software and road safety. The programme was planned over eight sessions, four on Pavements, Two on road safety and two on the practical aspects of both the topics.

19. Training programme on “Software applications in Transportation Planning

This training programme was conducted for faculty and students of College of Engineering Trivandrum from 09th -11th January 2023 and was attended by 56 participants, including faculty, research scholars and students. Dr. Vinoba Sunder Singh, Habog Consultants, Bangalore handled the sessions. The application of softwares, primarily CUBE software in transportation planning was dealt with. Hands on training were also part of the programme.



20. Stakeholders Meeting and Workshop on Draft IRC 111:2023 Revision

This workshop was conducted on 21.09.2023 in association with PWD, KSRRDA, KIIFB, KHRI, LSGD, NATPAC, NHAI, RKI etc., to discuss the modification in TRC 111: 2023. Dr. Anil R and Dr. Thushara V T coordinated the workshop. The suggestions were collected from the stakeholders, discussed at the meeting and the report was submitted.



21. Stakeholders' Meet on Collaborative Assessment of Practical Issues in Transportation (CAPIT)

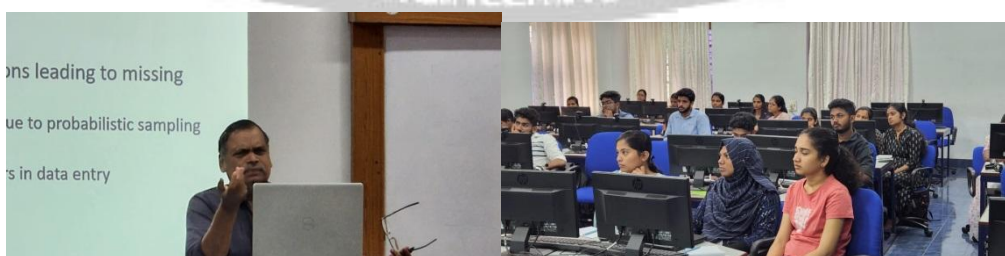
As per the suggestion of the consultative committee, a workshop for interaction with stakeholders were conducted on 2nd March 2024, to identify and discuss the technical issues in the field of transportation engineering. A questionnaire survey was conducted among the stakeholders and public as a prelude to the workshop and the issues raised by them were discussed. The event was attended by experts in the field who put forward their suggestions to the issues raised by the participants from various Government departments, research and consultancy institutions and contractors/ implementing agencies in the field. Dr. A Veeraragavan, Retd. Prof. IIT Madras, Dr. Kuncheria P Isaac, Former VC, KTU, Dr. MVLR Anjaneyulu, Professor, NIT Calicut, and Dr. Samson Mathew, Director, NATPAC were the invited experts. Er. Beena L, Chief Engineer, PWD, Er. Anilkumar S, Chief Engineer, LSGD, Shri. Arun R, Sr. DEN(Co), Southern Railway were also invited to express their views. The representatives from various organisations like PWD, KSRRDA, KIIFB, Town Planning, LSGD, KHRI etc. put forward the issues faced. The faculty and students of CET also attended the meet. The total number of people attended, including the experts were around 95.





22. Training Programme on “Statistical Techniques in Transportation Engineering”

This three day training programme was conducted for the students and faculty of College of Engineering Trivandrum from 31.01.2024 to 2.02.2024. The programme was coordinated by Dr. Anu P Alex. The primary objective of the program was to equip participants with the essential skills required for proficient utilization of the SPSS (Statistical Package for the Social Sciences) software in both fundamental and advanced statistical operations. Dr. Nagarajan Naidu, a distinguished Professor retired from the Department of Economics at University College, Thiruvananthapuram led the sessions. The faculty also attended training programmes and participated in conferences. The students also attended training programmes/workshop/field visits.



23. Technical talk by Dr. Vivek Tandon, Professor in Civil Engineering at University of Texas at El Paso (UTEP)

Dr. Vivek Tandon, a distinguished professor in civil engineering at the University of Texas at El Paso (UTEP), served as the keynote speaker for the technical talk organized by the Transportation Engineering Research Centre (TRC) on December 7, 2023. The talk was organised as two sessions. Nearly 125 participants attended the sessions including faculty members, M Tech students and research scholars from civil engineering and other sister departments.

Session 1- Technical talk on “Development of infrastructure for sustainable society”

This session was organised in the CGPU hall of College of Engineering Trivandrum from 9.30 am to 11.00 am. The talk was opened to all faculty members, research scholars and M. Tech students of all departments of CET. Dr. Anil R, the Head of the Department of Civil Engineering, extended a warm welcome to Dr. Tandon, and Dr. Savier J. S, the Principal of the College of Engineering Trivandrum, felicitated the esteemed speaker.

During the lecture, Dr. Tandon presented a comprehensive overview of sustainability aspects, including life cycle assessment and global warming. The significance of life cycle assessment was outlined, along with an explanation of the background and scope of the International Standard ISO 14040 on Environmental Management-Life Cycle Assessment-Principles and Framework. The presentation included insights into common emission impact categories, discussions on greenhouse gases, the greenhouse effect, and observed effects related to global warming potential. Dr. Tandon elaborated on the characterization of global warming potential, providing an illustrative example. Towards the conclusion, he delved into life cycle assessment for transportation infrastructure, covering topics such as environmental performance measurement of pavements and life cycle emissions of cement and concrete. Additionally, various sustainable practices in the transportation sector, such as gasoline trucks, water transportation, and mixed planning areas, were introduced.

After concluding the presentation, participant queries were addressed, and a feedback session was conducted. Dr. Anu P Alex, Associate Professor in the Department of Civil Engineering at the College of Engineering Trivandrum, delivered a vote of thanks. The session offered valuable ideas and insights for implementing sustainable practices in infrastructure projects.

Session 2- Technical talk on “Flooding potential and resilience evaluation of critical transportation infrastructure after an extreme weather event”

This session was organised in Seminar Hall II of Department of Civil Engineering, College of Engineering Trivandrum from 11.30 am to 1.00pm. The talk was opened to all faculty members, research scholars and M. Tech students of Civil Engineering department of CET. Dr. Anil R, the Head of the Department of Civil Engineering, provided an introduction and extended the invitation to the speaker.

Dr. Tandon commenced the session with an overview of critical infrastructure, followed by a systematic exploration of the procedures involved in measuring and ranking flooding hazards for transportation infrastructure. He elaborated on the GIS softwares employed for data collection, including ArcMap 10.8.1 and HEC-HMS 4.8, and ArcGIS, utilized for watershed creation and land cover identification. The presentation delved into the methodologies, procedures, and outcomes, encompassing the use of HEC-HMS, TR 55, and PCSWWM softwares. Dr. Tandon also addressed hydraulic modelling methods for simulation and discussed the assignment of hazard ranks ranging from 1 to 4, signifying very low to very high-risk zones. Concluding his talk, Dr. Tandon provided recommendations for future studies, particularly focusing on zones with a rank of 2. Subsequently, participant queries were addressed, and a feedback session was conducted. Expressing gratitude, Dr. R Padmakumar, Associate Professor in the Department of Civil Engineering, offered a vote of thanks. The session seamlessly integrated elements of engineering and hydrology, providing a harmonious blend of expertise in both disciplines.



Summary

The completion of 23 training programs, covering a wide range of topics such as pavement design, traffic management, intelligent transportation systems, and the use of specialized software like VISSIM, CUBE, IITPAVE, reflects a comprehensive effort to enhance knowledge and skills across various sectors of infrastructure and transportation. Each program has contributed to the professional development of participants, equipping them with the latest industry practices, innovative solutions, and practical applications. These training sessions have also facilitated valuable networking opportunities and encouraged the exchange of ideas and experiences among participants from different backgrounds. The training programs

conducted have collectively played a crucial role in advancing the capacity and competency of professionals involved in infrastructure development and transportation management. By focusing on contemporary challenges and adaptive solutions, these programs have ensured that participants are well-prepared to tackle real-world issues with innovative and sustainable approaches. The inclusion of hands-on training in specialized software and practical sessions on road safety, quality control, and pavement design has provided participants with the practical skills necessary to implement these concepts effectively.

In conclusion, these training initiatives have not only enhanced individual competencies but have also contributed to broader societal goals by promoting safe, efficient, and sustainable infrastructure. The knowledge and skills gained from these programs will continue to benefit participants and their organizations, ultimately leading to the improved quality and sustainability of infrastructure projects. The successful completion of these programs highlights the importance of continuous learning and collaboration in addressing the complex challenges of modern infrastructure and transportation systems.

