सीएसआईआर-केन्द्रीय सड़क अनुसंधान संस्थान
CSIR-CENTRAL ROAD RESEARCH INSTITUTE
पी.ओ.: सीआरआरआई, दिल्ली–मथुरा मार्ग, नई दिल्ली–110025 (भारत)
P.O.: CRRI, Delhi - Mathura Road, New Delhi -110025 (INDIA)
वेबसाइट / Website: www.crridom.gov.in

MECHANICAL AND TRANSPORT DIVISION

MAJOR RESPONSIBILITIES

- Design and development of mechanical equipment required by R&D divisions
- Repair of mechanical equipment
- Transport Management

MAJOR INFRASRTUCTURE FACILITIES

- Spot Welding machine
- Lathe machine
- Welding Set (portable)
- Surface Grinder
- Gas Welding Set

SIGNIFICANT ACHIEVEMENTS

- Fabrication of Mould for I - Section Beam Casting
- Development of Ponding cum Debris Expulsion Test Equipment (Patent Applied)
- Support for Creation of Expansion Joint Testing Facility
- Development of Nuclear Density Gauge Mounting Device
- Development of LVDT Mounting Device
- Development of Falling Weight Impact Tester
- Fabrication of Chimney Models
- Development of Low-cost Gymnastic Equipment for CRRI colony

INFORMATION, LIAISON & TRAINING DIVISION





The Information, Liaison & Training Division is a nodal point between the Institute and outside agencies for promotion, utilization and implementation of Institute knowledge base. The main activities of the division include dissemination of information; research liaison; development of human resource; organizing specialized training programmes for the highway and transportation professionals; and marketing of Institute's knowledge base.

Dissemination of R&D findings / products is promoted through a variety of channels like publications of Annual Reports, Newsletters, Profile, Sadak Darpan & Training Booklet and the participation in Conferences, Seminars, Workshops and technical exhibitions to popularize the significant achievements and capabilities of the institute.

Regular training programmes are organized on various aspects of road & road transportation to develop trained manpower for effective implementation of the research based technologies in highway sector. Besides, customized training programmes are also organized to meet the specific requirements of the clients. The division also interacts with foreign organisations related to projects of mutual interest for exchange of scientific information.

First International Conference on Pavements and Computational Approaches (ICOPAC) 2018

FACILITIES

- Halls of different capacities to organize Workshops, Training Programmes and Seminars
- Training Facilities with Modern Projection and Audio-Visual Facilities
- Guest House and Canteen
- Multi-Media Facilities
- Photographic, Video recording and Lamination Facilities

EXPERTISE

- Training & Human Resource Development
- Event Management
- Marketing Institute's Knowledge base
- Interaction on Social Media

SERVICES OFFERED

- Capacity Building of Highway Engineers from Road Organizations
- Regular and Customized Training Programmes for Highway Engineers
- Dissemination of Road Transport related issues through Technical Exhibitions
- Training Needs of CSIR-CRRI staffs outside CSIR-CRRI
- Publications of Annual Report, Newsletter, Sadak Darpan, Training Booklet and Profile etc.
- Student's Internship / Dissertation Works
- International Scientific and Technological Affairs
- Event Management
- Govt. Programs like JIGYASA, SWACHH BHARAT
- Important Day Celebrations

TRAINING PROGRAMMES OFFERED

CRRI organizes following training programmes. User agency can avail the training facility of CRRI.

REGULAR PROGRAMMES

- Quality Assurance, Health Assessment and Rehabilitation of Bridges
- Design of Bridge Structure and Foundation
- Traffic Engineering and Road Safety Audit
- Geo-Spatial Technology (GIS, GPS, RS) for Roads and Transportation
- Design, Construction and Quality Control in Flexible Pavements
- Design, Construction, Quality Control and Maintenance of Rigid Pavements
- Pavement Evaluation Techniques and their applications for Maintenance and Rehabilitation
- Geotechnical and Landslide Investigations for Highway Projects
- Landslide Mitigation and Detailed Project Report (DPR)
- International Course on Dissemination of HDM-4

CUSTOMIZED TRAINING PROGRAMMES

In addition to the above, CSIR-CRRI also organizes customized training programmes as per the specific requirements of the clients. Some of the successfully organized programmes are given below for reference:

- New Construction Materials, Innovative Technology and Use of Waste Plastic for Rural Roads
- Planning, Design, Construction and Maintenance Management of Flexible and Rigid Pavements
- Construction of Cement Concrete Pavements for Low Volume Traffic Roads
- Project Preparation, SBD, Quality Assurance, R&D & New Innovative Technology and Maintenance of Rural Roads
- Quality Control and Quality Assurance for Roads and Bridges
- Good Practices in Highway Construction and Quality Assurance and Quality Control Aspects
- Bridge Design (Culverts, Minor & Major Bridges) and Construction
- Capsule on Airfield Engineering

CRRI Foundation on July 16, 2019

CRRI Stall in Technical Exhibition of
79th Annual Session of IRC at Nagpur, 2018

International Yoga Day on 21 June, 2016

National Hindi Workshop on "Development of Basic Infrastructure and Challenges of 21st Century", September 06, 2019

A view of training participants with faculty members

DOCUMENTATION & LIBRARY SERVICE DIVISION

The library has developed a well balanced and up-to-date collection of over 90,000 books, periodicals, conference proceedings, maps, audio/video cassettes and CD ROM based databases, etc. containing worldwide information in the field of highway engineering, traffic and transportation engineering, bridge engineering, geotechnical engineering and related areas.

Access to worldwide literature is provided through various documentation and library services. In-house bibliographic database of library holdings on transportation and highway engineering is being developed. Access to E-journals is being provided through Internet from various publishers like ASCE, ICE, Springer, ASTM Digital Library etc. under National Knowledge Resources Consortium (NKRC). Online access to Indian Standards (Civil Engineering) is also provided.

Books

EXPERTISE

- Bibliographic Services
- Literature Search Service
- Database Development in the Field of Highway & Transportation Research
- Computerization of Library Services
- Selective Dissemination of Information Service

SERVICES OFFERED

- Reference and Referral Service
- User Education and Training
- Circulation and Inter Library Loan
- E-CART(Current Awareness in Roads & Transport) Bulletin
- Access to World eBook Library (WEL)

RESOURCES

- 90,000 Books, Periodicals, Technical Reports, Standards and Specifications, Conference Proceedings, etc.
- ASTM Digital Library
- CSIR National Knowledge Resources Consortium (NKRC): Access to E- journals from ASCE, ICE and many more
- Online Access to Indian Standards (Civil Engineering)

Journals

Library-View 1

Library-View 2

Library-View 3

MAINTENANCE DIVISION

MAJOR RESPONSIBILITIES

- Identification and Planning of Infrastructural Needs for R&D Activities
- Construction and Management of the Infrastructural Development Works
- Repair and Maintenance of Institute Buildings & Roads
- Coordination and Management of Housekeeping and Sanitation Services in the Institute
- Management and Disposal of Institute Waste
- Management of Water Supply and Distribution including Rain Water Harvesting System
- Liaison with the Municipal and Local Authorities
- Management and Supervision of Pest Control Services in the Institute Campus
- Repair and Maintenance of Electrical Installation and Equipment
- Augmentation / Upgradation of Substation
- Repair and Maintenance of Electronic Equipment
- Operation and Maintenance of Air-conditioners & A.C. Plant
- Eco-Campus Development

SIGNIFICANT ACHIEVEMENTS

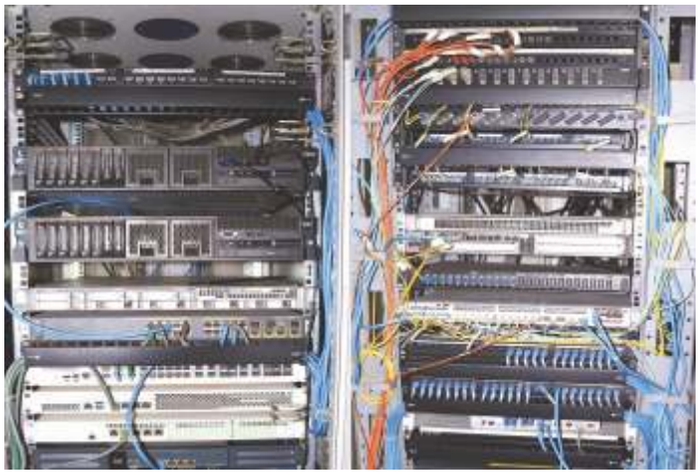
- Implementation of e-Tendering System
- Appointment of Consultant/Architect for Revision of Master Plan of CRRI Institute and Residential Campus
- Creation of Modern Laboratory on Steel Slag in Flexible Pavements Division
- Renovation of Ground Floor and 1st Floor of Administrative block
- Renovation of Civil Section (1st Floor of GTE Division)
- Renovation of Guest Houses

COMPUTER CENTRE & NETWORKING DIVISION

The main objective and function of CCN Division is to meet the ICT requirements in R&D related activities of the institute. It also recommends and implements the information technology strategies, policies and procedures by evaluating organizational needs towards various IT services.

SERVICES OFFERED

- Operation and Maintenance of secured LAN & WiFi facilities of the institute
- Server & End-user protection using the centralized Corporate Antivirus Security Solutions
- Website Development and its Maintenance
- Web Application Development for online Recruitment
- Other IT Support facilitated by the division:
  - Procurement of IT hardware and Software items
  - Providing E- Mail facility to all the Staff in the institute
  - IT supports for Seminars, Video conferencing and webinars
  - Technical support in Maintaining AEBAS devices
  - Hardware and Software supports of all the IT equipment in CRRI including Servers, PCs, Printers, Laptops and peripherals.
  - Installation and configuration of various scientific software like ArcGIS, Plaxis, Matlab, AutoCAD, Geo5 etc.



  - Training of staff members and students on IT literacy
  - Alignment of CRRI with RTI Online, Govt of India portal, updating Suo-motu disclosure, regular submission of quarterly reports etc.

QUALITY MANAGEMENT DIVISION

Responsible for Quality Management System operating in the Institute effectively and efficiently. Besides, adopting higher level of quality standards in working of the Institute is also the mandate of the division.

ISO 9001:2015 CERTIFIED Quality Management System

SERVICES OFFERED

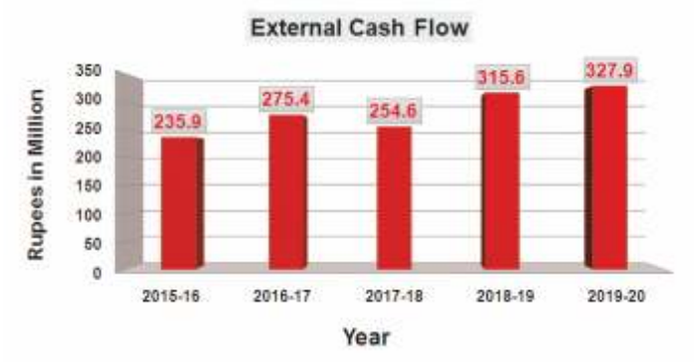
- Internal Quality Audits by Trained Quality Auditors to determine the conformity or non-conformity of the quality system elements with specified requirements.
- Management Review Meetings to reveiw and discuss the findings of internal quality audits.
- Renewal Audit by Bureau of Indian Standards (BIS) for renewal of Institute License for quality management system certification from time to time.
- Review of Quality Policy of the institute

PLANNING, MONITORING & EVALUATION DIVISION

The main activities of PME Division are R&D Planning, Performance Monitoring & Management, Preparation of Annual Budget for the Institute, Manpower planning for different R&D areas and projects, Knowledge Management in Consonance with R&D needs, Identification and Monitoring of In- house Research Projects, Facilitation for Research Council, Management Council and other Committees of the Institute.

SERVICES OFFERED

- Performance Management of CSIR Plan Projects & In-house Projects
- Planning Monitoring & Evaluation of Externally Funded Projects
- Development and Maintenance of Project Management System (Web based)
- Monthly and Quarterly Performance Reports
- Handling Parliament Questions
- Review of R&D Performance
- Preparation of Annual Budget
- Customer Satisfaction Evaluation
- GST related activities
- Technical Audit
- Documentation of new and emerging technologies developed by the Institute
- Integrating technology management aspects including IPR management with R&D and business development
- Safeguarding and exploiting IPR portfolio
- Creating high performing network of R&D professionals and organizations ascertaining product development
- MoUs and Agreements
- ERP Implementation



External Cash Flow of CSIR-CRRI in last 5 years

Agreement Signed Between Between CSIR-CRRI and Faros Simulations Systems Pvt. Ltd. on February 13, 2019

MoU Signed Between CSIR-CRRI and MUSAD Engineering and Consultancy, Bangladesh on March 06, 2019

Agreement Signed Between CSIR-CRRI and Technocrats Kohlhauer Infrastructure Pvt Ltd, Mumbai on July 16, 2019

Agreement Signed Between CSIR-CRRI and
M/s JMMD Industries Pvt. Ltd., Lucknow on March 05, 2020

MoU Signed Between CSIR-CRRI and
Rural Connectivity Training & Research Centre (RCTRC) of
Assam, Chattisgarh and Madhya Pradesh on January 10, 2020

PAVEMENT EVALUATION DIVISION

Systematic monitoring of pavement performance including structural and functional evaluation by using modern devices helps in achieving long lasting and better performing pavements and efficient management of road and airfield pavement network.

THRUST AREAS

- Pavement Performance Studies
- Pavement Deterioration Modelling
- Structural and Functional Evaluation of Highway and Airport Pavements
- Investigation of Pavement Distress and Needed Remedial Measures
- Road Asset Management
- Road and Airfield Pavement Management
- High Speed Inventory and Condition Monitoring of Roads and Runways
- Non Destructive Tests for Pavement Evaluation
- Axle Load Studies for Planning of M&R Strategies

NSV-Rut & Distress Measurement

EXPERTISE

- Structural and functional evaluation of flexible and rigid pavements for roads and runways
- Evaluation and characterization of road construction materials
- Design and maintenance of flexible pavements
- Pavement performance evaluation and distress / failure investigations
- Strengthening/rehabilitation of flexible pavements
- Road inventory and pavement condition surveys
- Axle load studies
- Calibration of pavement management models like HDM-4
- Strategic planning of road works using HDM-4 and PAVER
- Development of maintenance management system for roads and runways
- Evaluation of PCN for airfield pavements and maintenance and rehabilitation needs

INFRASTRUCTURE FACILITIES

- Network Survey Vehicle for Road Inventory and Pavement Condition Surveys
- Testing Laboratory for Highway Materials and Mixes
- Heavy Weight Deflectometer (HWD) for Structural Evaluation of Highways and Runways
- Static Weigh Pads and Weigh in Motion System for Axle Load Surveys
- Integrated System for Determining the Performance Characteristics of Asphalt Mixture
- DIPSTICK and Walking Profiler for Absolute Roughness Measurements
- Automated Road Unevenness Recorder/Fifth Wheel Bump Integrator for Roughness Measurements
- Car Axle Mounted Bump Integrator with GPS for Roughness Measurements
- Accelerated Polishing Machine for Frictional Properties of Aggregates
- British Pendulum Tester for Frictional Properties of Pavement Surface.

NSV-Laser Profilomete

Fifth Wheel Bump Integrator

EQUIPMENT FOR PAVEMENT EVALUATION

British Pendulum Tester

Static Wiegh Pad

Weigh-In-Motion

Falling Weight Deflectometer

Core Cutting Machine

Dipstick and Walking Profiler

SOFTWARE TOOLS

- HDM-4 for Pavement Maintenance Management System and M&R Planning and Budgeting
- PDM for Pavement Deterioration Modeling
- Roadface for Computation of International Roughness Index (IRI)
- Hawkeye Processing Tool Kit
- AutoCAD Map 3D
- Arc Editor
- PAVER

LABORATORY & FIELD TESTING FACILITIES

- Functional and Structural Evaluation of Pavements
- Automated Road Inventory and Pavement Condition Survey
- Characterization of Highway Construction Materials
- Frictional Properties of Pavement Surface
- Polished Stone Value of Road Aggregates
- Axle Load Spectrum Surveys
- Calibration of Response Type Road Roughness Measuring System

SIGNIFICANT ACHIEVEMENTS

- Pavement Performance Studies for National and State Highways
- Development of Pavement Deterioration Models for Indian Conditions
- Development of GIS Based National Highways Information System
- Development of Management System for Maintenance Planning and Budgeting of High Speed Road Corridors
- Development of Database Management for Delhi PWD Roads
- Road Inventory and Pavement Condition Survey for Road Asset Management of Odisha PWD Roads
- Development of Airfield Pavement Management System (APMS) for 10 Airports in India
- Development of Road Maintenance Management System (RMMS) for Public Works Department, Government of Kerala.

BRIDGE ENGINEERING & STRUCTURES DIVISION

The division has acquired knowledge in almost entire spectrum of bridge engineering and a number of bridges have been analyzed, designed, structurally evaluated and rehabilitated as per the requirements. New methods are developed for the Analysis and Design, Health Monitoring of Structures, and Assessment and Rehabilitation of bridges.

THRUST AREAS

- Distress Diagnostics, Performance Evaluation and Rehabilitation of Bridges
- Performance Monitoring of Bridges
- Durability and Corrosion Studies of Bridges
- Aerodynamic Studies of Cable Stayed Bridges and High Rise Structures
- Dynamic and Fatigue Response of Bridges ad Structures
- Performance Evaluation of Bridge Bearings and Appurtenances

SIGNIFICANT ACHIEVEMENTS

- Project Monitoring and Quality Assurance of Bridges
- Load Carrying Capacity Evaluation of Bridges using Non-Destructive Evaluation including Load Testing
- Health Assessment of Bridges using Instrumentation
- Rehabilitation of Bridges
- Evaluation of Corrosion Protective Coatings for Concrete and Steel
- Evaluation of Pile Integrity and Depth of Foundation
- Performance Evaluation of Bridge Bearings and Appurtenances
- Wind Tunnel Studies on Cable Stayed Bridges
- Vibration Monitoring of Bridges
- Development of Bridge Management System including Software for Remaining Life Assessment of RC Bridges

EXPERTISE

- Structural Safety Audit
- Technical Audit of Structures
- Analysis and Design of Bridges
- Distress Diagnostics using Non-Destructive Evaluation of Bridges
- Performance Evaluation of Highway and Railway Bridges
- Rehabilitation and Strengthening of Bridges
- Project Monitoring and Quality Assurance of Bridges
- Health Monitoring of Bridges using Instrumentation
- Performance Evaluation of Bridge Bearings and Appurtenances
- Durability Studies including Corrosion Assessment of Bridges
- Use of Innovative Materials for Construction and Rehabilitation of Bridges including Nano Materials, Advance Composites

R&D FACILITIES

- Mobile Bridge Inspection Unit (MBIU)
- 200 T Universal Testing Machine
- ±50 T Fatigue Testing System
- 400 T/ 100 T Bi-axial Testing Machine for Elastomeric Bearings
- Dynamic cum Heavy Testing Laboratory Wind Tunnel Laboratory
- Field Instrumentation
- Non-Destructive Testing
- Bridge Expansion Joints Testing Facilities
- Vibration Monitoring Test Facilities
- Heavy Testing Bed (20m * 9m) with Anchoring Facility and Static Loading Frame

Mobile Bridge Inspection Unit

200T Universal Testing Machine

400T / 100T Biaxial Bearing Testing Machine

Heavy Testing Laboratory

Instrumentation Laboratory

Pile Integrity Test Apparatus

U P V Test Apparatus

Instrumentation of Well Foundation at Ganga Bridge Varanasi

Installation of V W Strain gauges at Lok Nayak Setu, New Delhi

Installation of V W Temperature Sensor at Ganga Bridge, Varanasi

RIGID PAVEMENTS DIVISION

THRUST AREAS

- Design, Evaluation, Repair and Rehabilitation of Concrete Pavements
- Prevention of Premature Distresses in Concrete Pavements
- Concrete Road for Sustainable Development
- Technical Audit of Cement Concrete Highways
- Instrumentation for Rigid Pavements
- Utilisation of Industrial Wastes and By-Product materials in the Construction of Concrete Roads
- Use of Low and High Modulus Hybrid Fibres in the Construction of Concrete Pavements
- Use of Post-Consumer Materials such as C&D Waste Derived Aggregate in Concrete Roads
- Use of the Concept of Less is More in the Construction of Concrete Pavement

R&D FACILITIES

- Servo Control Hydraulic Testing Machines
- Walk-In-Environmental Chamber
- Dry Shrinkage Apparatus
- Abrasion Testing Machine For Concrete Surface
- Plastic Shrinkage of Concrete
- Universal Testing Machine
- Accelerated Curing of Concrete
- Testing of Impact Resistance of Concrete
- Non-Destructive Testing of Concrete Using Ultra Sonic Pulse Velocity And Lock & Capo Test
- Flexural Strength Testing Machine
- Testing of Cement and Pozzolanic Material
- Testing and Evaluation of Coarse and Fine Aggregate

EXPERTISE

- Design, Evaluation, Maintenance and Repair & Rehabilitation of Cement Concrete Pavements for Highways, Airport Runways, Street & Campus Roads
- Technical Audit of Cement Concrete Highways
- Design, Construction, Evaluation, Maintenance and Repair of White topping (Ultra thin, Thin and Conventional) including short panel Concrete Pavements
- Design of Cement Concrete Mixes with Supplementary Cementitious Materials (Fly Ash, Silica Fume, Rice Husk Ash etc.) Synthetic, Natural and Steel Fibres, Waste and Marginal Materials.
- Self Compacting Concrete, High Performance Concrete, High Volume Fly Ash Concrete.

SIGNIFICANT ACHIEVEMENTS

- Thin and Conventional White Topping for Rehabilitation of Distressed Bituminous Pavements
- Roller Compacted Concrete for Pavements
- High Volume Fly Ash Concrete for Pavements
- High Performance Concrete for Pavements
- Development of Concrete Mixes Using Wallastonatie Micro Fibre
- Synthetic Fiber Reinforced Concrete
- Use of Slags, C&D Waste and Marble Slurry Dust in Paving Concrete
- Magnesium Phosphate Cement for Quick Repair of Concrete Pavements
- Magnesium Oxy-Chloride Cement in Paving Concrete
- Utilization of RAP in DLC

SERVO CONTROL MACHINE

WALK-IN-ENVIRONMENT CHAMBER

BRITISH PENDULUM TEST APPARATUS

DRYING SHRINKAGE TEST APPARATUS

ADVANCE TEST FACILITIES

ABRASION TESTING MACHINE

IMPACT RESISTANCE TEST APPARATUS

UNIVERSAL TESTING MACHINE

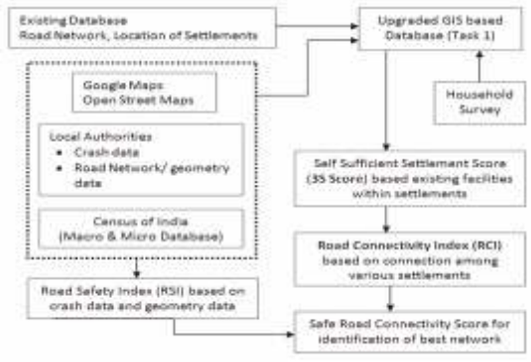
MUFFLE FURNACE, 1000^{0}C

TRANSPORTATION PLANNING & ENVIRONMENT DIVISION

The division strives to develop new tools, methods, technologies and policies by cutting edge R & D and Consultancy works in the area of Intelligent Transportation Systems (ITS) with real time traffic and weather information, Soft-computing Techniques for travel demand modelling, Freight travel demand modelling, logistics planning, Smart Parking, Facility location planning, Geographical Information Systems (GIS) & Digital Image Processing Applications, Transportation Economics & Fuel consumption, Vehicular emission, Transport Noise and Vibration, Road safety for Children, Planning for Sustainable Public Transportation and Non motorised transport, Transport policies and plan for congestion management.

THRUST AREAS

- Techno- Economic Feasibility Studies for Transportation Systems
- Road User Cost Studies
- Traffic Impact Analysis- Office Complex, Housing, Bypass Roads
- Estimation of Traffic Loads on Urban Roads
- Transportation System Management
- Noise Mapping & Vibration Studies
- Monitoring, Measurement, Modeling & Evaluation of Noise Pollution
- Mode Choice Modeling
- Travel Demand Forecasting for Passenger and Freight
- Travel Demand Estimation using Soft-computing Techniques
- Public Transit Assignment
- Vehicle Exhaust Emission Studies
- Intelligent Transportation Systems (ITS) & Management for Smart Cities & Villages
- Fuel Consumption and Idling Emission Study and its Mitigation
- Rural Road Safety and Rural Connectivity
- Pollution Sensor Development using Nano Technology
- Digital Image and Signal Processing for Automated Vehicle Counting and Classification
- Feasibility of E-Highway, E-Vehicles and its Infrastructure
- Application Software for Transportation Solutions
- Low Cost Driver Simulator



Safe Road Connectivity

EXPERTISE

- Transportation planning and modeling
- Comprehensive traffic and transportation studies
- Techno-economic feasibility studies of roads and transportation system
- Fuel consumption and emission studies and impact of road condition on fuel consumption
- Planning for sustainable public transport, feeder IPT mode and non-motorized transport
- Freight travel demand modeling
- Intelligent transportation systems (ITS) for effective and efficient traffic management
- Smart parking technology and solutions
- Rural connectivity and safety
- Transportation noise and vibration: measurement, modeling and mitigations
- Traffic and environmental impact assessment of housing, roads and transportation projects (Metro, highway and Railway) vehicular pollution monitoring and road dust control
- Measurements, monitoring and evaluation of air and noise pollutions due to road & transportation projects
- Development of policy tool kits by integrating environment and transportation projects
- Transport related GHG emission studies
- Effect of air and noise pollution on the health of population
- Development of pollution measurement smart sensors using nano technology
- Human response to vibration

Mobile Portable Gas Analyzer (Autoplus 4-2)

SIGNIFICANT ACHIVEMENTS

- Multimodal Travel Demand Model for Evaluation of Sustainable Transport System
- Pilot Study for the Development of Surface Enhanced Raman Scattering (SERS) based Sensors for the Detection of Environmental Pollutants (Air/Water/Soil)
- Land-use Based Parking Policy: A case study of Delhi
- Microscopic Traffic Simulation Model for Inter-City Roads for Indian Conditions
- Safe Road Connectivity for Tripura State of North East Region of India
- Estimation of Fuel Losses and Assessment of Air Quality at Selected Traffic Intersections in Delhi
- Impact of Road Condition on Fuel Consumption of Vehicles
- Route Choice and Frequency Optimization under Countdown Information for Bus Passengers with Strict Capacity Constraints
- Conducting Traffic Studies and Pollution Exposure to Quantify the Health Impact
- Awareness Campaign and related Traffic Studies at 100 Signalized Intersections of Delhi
- Traffic Studies for Identified Intersection Improvement at Vadodara City
- Traffic and Transportation Study for Beneficiation Plant Expansion at Dabuna , Joda Odisha
- Quantification of the Reduction of Air Pollution Level due to Bypassing Vehicular Traffic on Eastern Peripheral Expressway (EPE)
- Assessment of Traffic Characteristics and Impact of Trilokpuri and Mayur Vihar Pocket-I Metro Stations of Line 7 of Delhi Metro on Vasundara Road

GPS based Data Acquisition System along with
Fuel Flow Detector Meter and Engine RPM Meter

Overall saving in pollution due to EPE			
Pollutant	Total Vehicular Emission Load on Delhi@	Total Vehicular Emission Load on EPE	Emission Load Saved in Delhi due to EPE
$PM_{2.5}$*	116.2	1.0	0.9
NOx	113.4	8.0	7.1
CO	322.4	8.0	2.5
@IIT Kanpur Study for Delhi (2016) * PM2.5 = PM for emissions from vehicles			

R&D FACILITIES

- Laser Speed Gun
- Microflown Acouisticam
- Microflown Surface Impedance Meter
- Sound Level Meter
- Sound Book
- Sinus Tri-axial Hand Accelerometer
- Universal software package for noise and vibration measurements (SAMURAI)
- Tri- axial accelerometer for whole body vibration
- Climate Chamber
- Exhaust Gas Analyser for Diesel Engines
- Reflecto Meter
- Video V BOX
- Static Weight Pads
- Microaethelometer
- Auto Sampler for Collection of BTEX in Air
- CO Personal Monitor
- Davis Vantage Vue Wireless Weather Station
- Portable Gas Chromatography
- PM10 Particulate Sampler
- GPS based Data Acquisition System
- Fuel Flow Detector Meter and Engine RPM Meter
- Mobile Portable Gas Analyzer (Autoplus 4-2)
- Performance Box
- Black Magic Intensity Shuttle

Micro Flown Acoustic-Cam

GEOTECHNICAL ENGINEERING DIVISION

Pioneered in design and monitoring of ground improvement techniques for soft soil areas, remedial measures for landslide hazard and use of waste / marginal materials in road works.

Municipal solid waste for the construction of embankment

THRUST AREAS

- Ground Improvement Techniques
- Soil Stabilization
- Landslide Hazard Mitigation & Rock fall control
- Use of Waste and Marginal Materials
- Use of Municipal Solid Waste in road embankments
- Use of Soil Nailing in Underpass & Underpass Intersections

Stacking and spreading of copper slag by grader,
Madurai-Tuticorin expressway, Tamil Nadu

SIGNIFICANT ACHIEVEMENTS

- Use of waste materials like Municipal solid waste, Industrial wastes, Construction & Demolition waste and soft aggregates in Road and Embankment construction
- Solutions to problems associated with road construction in snow bound areas, coastal delta, desert areas and marine soil.
- Development of design and construction specifications by using Geosynthetic materials
- Slope stabilization by soil nailing for the construction of grade separated underpass
- Designing rock-fall and landslide mitigation measures
- Study on reinforced earth embankment behavior under cyclic loading
- Pavement performance study on road constructed by using waste materials
- Soil stabilization by mechanical and different new chemicals/stabilizers
- Stress-strain behavior of road constructed on soft soils under cyclic loading
- Failure investigation of reinforced earth walls
- Investigation and remediation of rock slope based on Rock Mechanics studies
- Box pushing technique for construction of multilevel underpass

Construction of jarofix embankment, SH-9, Chittorgarh, Rajasthan

R&D FACILITIES

- Soil and rock testing equipment
- Computerized Direct and Triaxial shear testing apparatus
- Software for geotechnical applications like Geo 5, Plaxis , Soil works for high embankment design, settlement analysis, reinforced earth wall design, soil nailing, etc.
- Large direct shear box test
- Pull out and connection strength test for Geosynthetics
- Small scale physical model tests facility
- Large scale cyclic plate load test facility
- Embankment model study by cyclic and static loading

Soil stabilization with cement at Amritsar, Punjab

Investigation, Design and Remedial Measures for protection of slopes at Bailey bridge, Pambai Valley

Remedial measures for Rock-fall at Zirakpur-Parwanoo expressway, Himachal Pradesh

Ground improvement of marine soil with band drains

Construction of Rail Underpass by Box Jacking with Soil nailing at Pragati Maidan

Pull out test apparatus for geosynthetics

Large Scale Model Study for Underpass Intersection by Box Jacking with Soil Nailing

Physical model testing (Static loading) facility for embankments and foundations

Large Scale Cyclic Plate Load Test Facility

TRAFFIC ENGINEERING & SAFETY DIVISION

Pioneer in the following:

- Traffic Management Strategies for Urban Road Network and Highways,
- Road Safety Audit,
- Design of Transport Infrastructure,
- Imparting Knowledge to practicing Engineers on Road Safety and Road Safety Audit,
- Knowledge Centre for the evaluation of skill level of Special Protection Group (SPG) Drivers
- Testing of Retro-Reflective Boards

THRUST AREAS

- Development and Evaluation of Intelligent Transport Systems (ITS) for Indian Conditions
- Road Safety Audit Studies for Expressways, National Highways, State Highways, Major District Roads and Urban Roads.
- Road User Behaviour Studies and Safety of Vulnerable Road Users
- Driver Testing & Evaluation
- Economic Evaluation of Road Safety Interventions
- Design and Evaluation of Traffic Control Devices for Urban Roads and Highways
- Corridor Improvement Studies for Urban Areas and National Highways
- Traffic Engineering and Management Studies for Metropolitan Cities
- Geometric Design of Roads and Intersections
- Development of Speed-Flow Relationship for Inter City Highways
- Accident Analysis and Remedial Measures
- Economic Evaluation of Highway Projects
- Road Safety Audit and other Road Safety Related Aspects for Road Safety Auditors/ Highway Engineers/ Traffic Engineers/ Transportation Planners and Student Interns
- Assessment and Evaluation of High Security Registration Plates (HSRP)
- Formulation and Revision of Indian Roads Congress documents related to Road Signs, Road Markings, Traffic Safety Barriers, Economic Evaluation of Highway Projects

15-day Certification Course on Road Safety Audit and other Associated Road Safety Aspects

Field Measurement of Retro-Reflectivity of Sign Boards

EXPERTISE

- Planning and Design of Transport Infrastructure
- Planning & Design of Roads, Intersections and Interchanges
- Testing and Evaluation of Traffic Control and Safety Devices
- Testing and Evaluation of Motor Vehicle Drivers
- Road Safety Audit
- Road Safety Education
- Planning and Design of Traffic Control Measures and Road Safety Measures
- Planning and Design of Safety Measures for Vulnerable Road users and People with Disabilities (PwD)
- Economic Evaluation of Road Projects and Safety Interventions
- Resource Centre for imparting 15-day Certification Course on Road Safety Audit and other Associated Road Safety Aspects" in conformity with the course curriculum requirements identified by Ministry of Road Transport and Highways (MoRTH), National Highways Authority of India (NHAI) and Indian Roads Congress (IRC).

SIGNIFICANT ACHIEVEMENTS

- Development of Maiden edition of Indo-Highway Capacity Manual
- Road Safety Audit of National & State Highways
- Development of Indigenous Car Driving Simulator
- Comprehensive Mobility Plans for Major cities (Nagpur, Surat, Ahmedabad, Ghaziabad, and many more)
- Creation of Road Safety Auditors in the country
- Revision and Formulation of IRC codes
- Evaluation of High Security Registration Plates

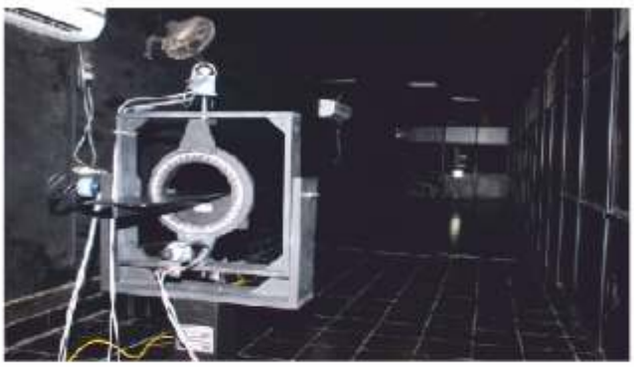
R&D FACILITIES

- Radar Guns for Speed Measurement
- TRANSYT 12.0 Software
- CUBE VOYAGER
- HEADS 14.0
- Variable Message Signs
- Equipment for Psycho-physical Evaluation of Motor Vehicle Drivers and other Road Users
- Indigenous Developed Car Driving Simulator
- State of the Art Photometry Laboratory
- Retro-reflectivity Measuring Equipment

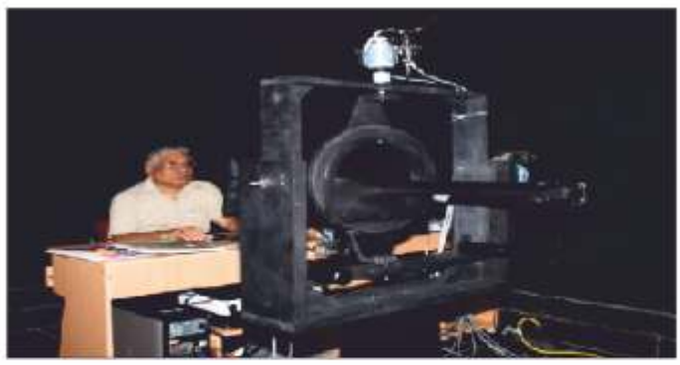
Typical Illustration of Testing of Nighttime Illumination

Driver Testing Facilities and related Projects

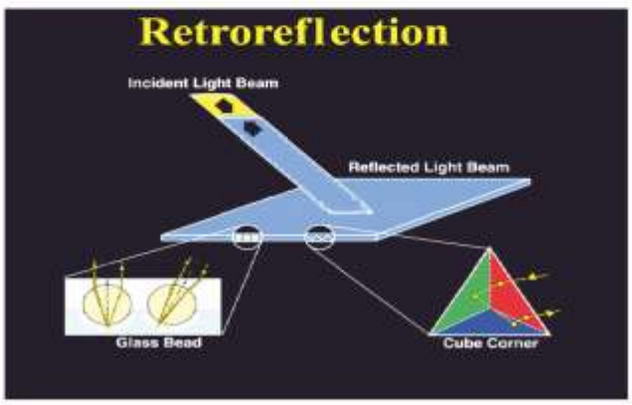
Retro Reflective Testing Laboratory



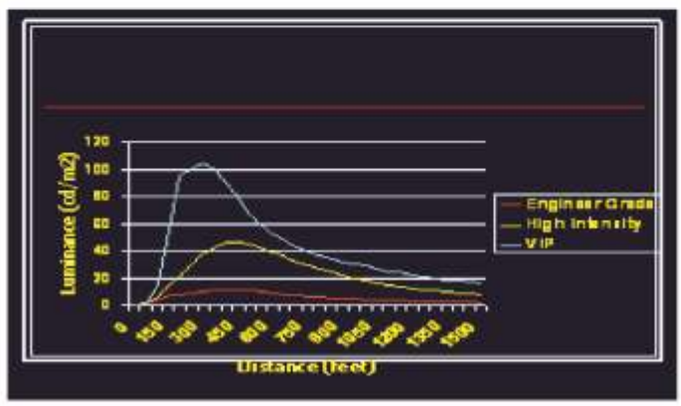
View of Computerised Retro-Reflectometer



Testing of Reflective Sheets, Road Studs and Road Marking Plant



Two Systems of Retroreflection



Luminances for Different Sheeting Materials for a Right Shoulder Sign Viewed from a Car

FLEXIBLE PAVEMENTS DIVISION

Continual effort for development of numerous high performance and environment friendly materials and techniques through innovative research that help the road infrastructure development agencies in construction of better quality roads and their upkeep/maintenance to add to economical growth of the country. The focus lies in achieving the economy, environmental protection, waste utilization, saving of materials and energy in order to have sustainable pavements.

THRUST AREAS

- Development of Improved Organic Binders
- Sustainable Pavement Designs
- Better Performing Specifications for Bituminous Mixes
- Solutions for Distressed Pavements
- Development and Application of Cold Mix Technology
- Development of Warm Mix and Low Energy Asphalt
- Optimized use of Reclaimed Asphalt Pavement
- Innovative Materials and Design for Reduced Pavement Thickness
- Use of Waste Materials in Bituminous Layers
- Recycling of Pavement Layers
- Utilization of Steel Slag in Roads and Railways
- Roads for Rural Areas using Local & Waste/Marginal Materials

TECHNICAL CAPABILITIES

- Special Pavements for Ports, Industries, Mining areas, Refineries and Airports
- Analysis of Pavement Performance Parameters
- Development and Evaluation of New Materials
- Characterization of Bituminous Materials and Mixes
- Characterization and Evaluation of Rejuvenator for Recycling of Pavement
- Thin preventive treatments like Slurry Seal and Micro Surfacing
- Recycling of Bituminous Pavement
- Application of Waste Plastic in Road Construction
- Formulation of Guidelines, Standards and Specification for Road Works
- Setting up of Laboratories and Plants
- Training on Design, Construction and Maintenance of Flexible Pavements

EXPERTISE

- Characterization and Evaluation of Pavement Materials
- Pilot scale production of modified Bituminous Binders and Emulsions
- Superior performing Mix Designs for SMA, BC and DBM
- Design of Cold and Warm Mixes
- Design of Mix for Thin surfacing like Micro surfacing and Slurry Seal
- Methods for Waste Utilization in roads
- Foaming of Bitumen for Stabilization and Structural Improvement of Pavements
- Design of Flexible and Composite Pavements
- Pavement Failure Investigation and Remedial Measures
- Solutions for Distressed Pavements
- Engineering Solutions for Airfield Pavements
- Design of Cement Grouted Bituminous Mix for Surfacing of Flexible Pavements

SIGNIFICANT ACHIEVEMENTS

- Specifications and Guidelines for Use of Waste Plastic in Bituminous Surfacing
- Design and Construction of Bituminous Surfacing with Plastic Waste
- Design of Flexible Pavements for LPG Bottling Plants
- Design of Haul Roads in Open Cast Projects of Various Coal Fields
- Investigations of Distressed Pavement Sections on Several Major Corridors
- Development of Multigrade High Performance Modified Binders for Roads and Airfields
- Design of Flexible Pavement for Heavy Axle Load Vehicle & Crane Movements at Nuclear Power Plants, Port Trusts and Refineries
- Patching Mixes for Repair of Potholes
- Development of Cold Mix Technology for New Layers and Pothole and Patch Repair
- Additive Based Warm Mix Asphalt Technology
- Studies on Design, Construction and Performance of Micro-surfacing for Roads and Bridges
- Developed Pothole Repair Machine
- Developed VG-40 Binders
- Design Guidelines for Construction of Roads in High Altitude Areas using Locally Available Materials and Geosynthetics
- Utilization of Ferrochrome Slag in Road Construction
- Development of Composite Wearing Course such as Cement Grouted Bituminous Mixes
- Development of Specifications of Warm Mix Asphalt (WMA) for Indian Conditions
- Field Performance Evaluation of WMA Sections laid in India using Evotherm WMA Technology
- Rehabilitation of National Highways using Cold-in-Place Recycling
- Hot-in-Place Recycling (HIPR) Mix Design for Ranchi Ring Road

R&D FACILITIES

- Pressure Aging Vessel
- Brookfield Viscometer
- Rolling Thin Film Oven
- Dynamic Shear Rheometer
- Gyratory Compactor
- Flexure Fatigue Testing Equipment
- Indirect tensile and Creep Testing Equipment
- Accelerated Pavement Testing Facility (APTF)
- Equipment for Testing of Soil, Aggregate, Bitumen, Pavement and Bituminous Mixes
- Pilot Plant for PMB and Emulsion Preparation
- Equipment for Preparation & Evaluation of Bituminous Mixes
- UTM for Resilient Modulus Testing
- Large Size Wheel Tracker
- Hamburg Wheel Tracking Equipment
- Cannon Manning Glass Viscometer