

A Short Course on

SUSTAINABLE ROADWAYS – DESIGN AND CONSTRUCTION

24th – 25th September 2018

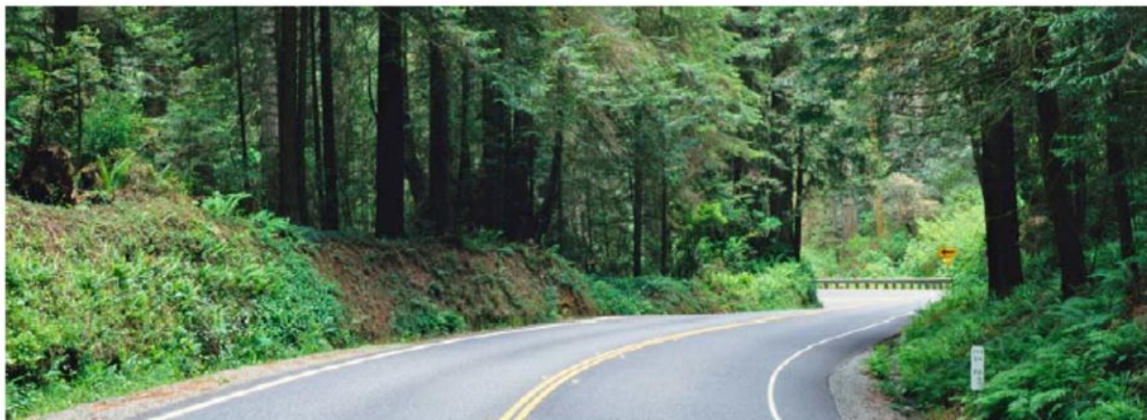
Centre for Infrastructure, Sustainable Transportation and Urban Planning (CiSTUP),
Indian Institute of Science (IISc), Bangalore, India

Background: In recent times, India has invested heavily on the development of both urban and rural roads. Road construction is a critical driver of infrastructure development, which supports industries, and a key to lifeblood of the economy. Road construction requires significant quantity of raw materials, mostly from natural resources, energy and water. Challenges are being faced by the industry in order to maintain economic and technological advances in spite of population growth and the explosive use of non-renewable natural resources. For the transportation industry, a balance needs to be attained between human needs for safety and mobility and the ability for the natural and economic environment to provide the resources necessary to achieve those goals. Therefore, constructing sustainable roadways will be an important step towards the implementation of the principles of sustainable development.

The key issues that affect sustainability in road construction include reduced construction through the achievement of longer-lasting roads, energy and natural resource consumption and greenhouse gas emissions. Life cycle analysis of materials and processes should be made to select alternatives that can improve sustainability of pavements. In the recent times, a number of assessment methods have been developed, primarily in the form of life cycle analysis (LCA) tools. Such tools contain, in addition to the cost benefit analysis (CBA), an analysis on the impact of construction on the environment, in the form of indicators. There is a critical need for dissemination of these information for capacity building in the area of sustainable road construction.

Specifically, the following topics need to be addressed: What is sustainable road construction? What are the materials, design, construction, user phase and maintenance impacts on sustainability? What are the recent developments in design, material characterization and techniques for achieving sustainability? How is life cycle assessment conducted? How can pavement projects be rated and certified for sustainability? Since one of the primary requirements of a sustainable roadway is its ability to perform adequately throughout its design life, this course will emphasize good practices for constructing long-lasting roads. The course will discuss topics such as:

- Design and construction of long lasting pavements
- White topping - sustainable solution for urban roads
- Design and Construction of Pervious Concrete Pavements
- Use of recycled materials for sustainable pavements
- Asphalt Rubber Gap Graded Mixes for Long Lasting Pavements
- Stone Matrix Asphalt for Sustainable pavements
- Maintenance and Rehabilitation Techniques for Long Lasting Pavements



Course objectives:

1. To expose the participants to the concepts of sustainable development
2. To expose participants to the impacts of road construction to the society in terms of environmental issues and cost economics
3. To build an understanding of the basic principles that tie construction to road life, performance and cost, including life cycle cost and sustainability
4. To develop an understanding of the use of principles and tools for assessing sustainability and rating of projects
5. To show and develop interest, and motivate self-learning in the various technologies of using innovative construction materials, equipment and steps for ensuring sustainable road construction
6. To develop capacity among the participants to utilize state of the art techniques, with full understanding thereof
7. To enhance the ability of the participants to identify research, development and implementation needs for specific sustainable technologies in road construction

Course Content:

Day1

1. Lecture 1: INTRODUCTION TO SUSTAINABLE PAVEMENTS
2. Lecture 2: CHALLENGES IN DESIGN AND CONSTRUCTION OF SUSTAINABLE PAVEMENTS
3. Lecture 3: USE OF INDUSTRIAL WASTES FOR SUSTAINABLE CONSTRUCTION
4. Lecture 4: LIFE CYCLE COST ANALYSIS
5. Lecture 5: USE OF GEOSYNTHETICS FOR SUSTAINABLE PAVEMENTS
6. Lecture 6: RELATING QUALITY OF CONSTRUCTION TO THE EXPECTED PERFORMANCE
7. Review, Discussion and Feedback

Day 2:

1. Lecture 7: COLD RECYCLING AND FULL DEPTH RECLAMATION – DESIGN AND CONSTRUCTION
2. Lecture 8: HOT RECYCLING FOR SUSTAINABLE PAVEMENTS
3. Lecture 9: DESIGN AND CONSTRUCTION OF SUSTAINABLE CONCRETE PAVEMENTS
4. Lecture 10: WHITE TOPPING – SUSTAINABLE SOLUTION FOR URBAN ROADS
5. Lecture 11: FORENSIC INVESTIGATION OF PRE-MATURE FAILURES AND ROAD ASSET MANAGEMENT
6. Panel Discussion

Who will benefit from the course: Government, industry and consultant engineers and students at all levels (BTech/MSc/MTech/PhD) or Faculty from academic institutions and technical institutions.

Course dates and venue:

Course Dates: **24th – 25th September 2018**

Venue: Centre for Continuing Education (CCE), Indian Institute of Science, Bangalore, India.

Registration:

Registration is necessary to attend this course and the fee is Rs. 2,500 plus 18% GST. Please register for the course online at the following link: <http://iisc.online/shortterm/home.html>

The last date for registration is **September 17, 2018**.

Number of participants for the course is limited to **40** on a first-come first-served basis.

The stakeholders of CiSTUP need not pay the registration fees, but registration is a must. Stakeholders of CiSTUP, please [register here](#).

The fee includes lunch and two snacks on all the two days. The course fee does not include accommodation. However, the participants may be provided accommodation on the payment basis (limited rooms are available, so accommodation will be provided on a first-come first-served basis, but not guaranteed).

Course Instructors: Prof. Rajib Basu Mallick, Prof. A. Veeraragavan, Prof. G L Sivakumar Babu, Industry personnel.