

From the Director's Desk.....



I have great pleasure in presenting the newsletter for the period April - June 2015. A remarkable effort during this period was the launching of three day 'Training Course for Drivers of Vehicles Carrying Dangerous and Hazardous Goods'. NATPAC's Road Safety Programmes are intended with a long-term vision. This issue of 'Mobility' focuses on developing a ropeway system at Ilaveezha Poonchira. Ropeways are the ideal means of transport for hillocks and summer tourism applications. They are neither weather nor climate-dependent and can be used to cross virtually any terrain. Being extremely ecological and economical in nature, they can be tailored exactly to the needs and requirements of the region and the users. Comparatively low investment along with low maintenance and operating costs makes ropeway an economically efficient alternative to conventional transport systems. Another impressive feature is its low level of emissions. The ropeway save the ecologically fragile area from vehicular pollution and also proves to be a major attraction for the tourists as visitors would get a birds eye view of the entire area.

### 1. STUDY ON THE FEASIBILITY OF ROPEWAY AT ILAVEEZHA POONCHIRA IN KOTTAYAM DISTRICT

Ilaveezha Poonchira is a tourist destination located in Melukavu village in Kottayam district near Kanjar and is surrounded by three enchanting hillocks - Mankunnu, Kudayathoomala and Thonippara. At the instance of Department of Tourism, Government of Kerala, NATPAC carried out a feasibility study for developing a ropeway system at Ilaveezha Poonchira to give a fillip to tourism activities in the region.

The study was conducted with several tasks like reconnaissance survey; preparation of base plan of the area and tentative sketch of alignment; assessment of geological, climatological and meteorological data relevant to the area; fixing of location of base station and intermediary points along with details of the span arrangement; assessment of tourists demand for the ropeway; selection of appropriate ropeway system, power requirements, electrical and telecommunication requirements,

with particulars about manufacturers/ vendors/ suppliers and major installations; indication of staffing requirements for operation and maintenance and efficient functioning of the project; assessment of the space required for support services like parking facilities; assessment of the total capital investment including Civil, Mechanical and Electrical components; estimation of cost of operation and maintenance; environmental impact assessment of the project and mitigative measures and financial analysis of the project.

#### 1.1 Ridership Forecast

The base year tourist visits at Ilaveezha Poonchira during the peak seasons was arrived at from local enquiries with jeep drivers and local residents. Daily tourist arrival to Ilaveezhapoonchira during peak season is estimated to be 250 persons. With the

development of Ilaveezha Poonchira, as a premium tourist centre, it is expected that there will be a quantum jump in the number of tourists visiting the spot. Tourist interview survey was conducted in nearby tourist destinations to know the expected tourist arrival to Ilaveezha Poonchira and their willingness to take a ride in ropeway. It is known from the tourist interview survey that, nearly 30 % of the tourists visiting Kottayam and Idukki districts are assumed to visit Ilaveezha Poonchira. To be on the conservative side, 25% of tourists visiting Kottayam and Idukki districts were taken as potential tourists to Ilaveezha Poonchira for the

year 2013 and thus the tourist demand is estimated at 253,176. The ropeway riders were obtained from the opinion survey of the tourist against different ticket charges.

Projection of ridership at ropeway system for various horizon years was carried out to assess the requirement of rope cars and to estimate the revenue accruals from operating the ropeway system. For projecting the ridership, growth rate method was applied. The projected ridership for various horizon years is shown in Table below:

**Ridership forecast of ropeway for horizon years**

Average & Peak seasonal Ridership	2013	2015	2020	2025
Average per month	15,247	17,784	26,131	36,650
Average per Day	610	711	1,045	1,466
Peak Day	1,108	1,293	1,899	2,664
Average Day Peak Hour	102	119	174	244
Peak Day Peak Hour	185	215	317	444

## 1.2 Alignment Selection

Several alignment options were considered after preliminary reconnaissance survey. Feasibility of alignment options were discussed and evaluated in detail by conducting aerial survey with the help of geo mapping software and geographical information such as Google Earth, ExpertGPS, Surfer etc.

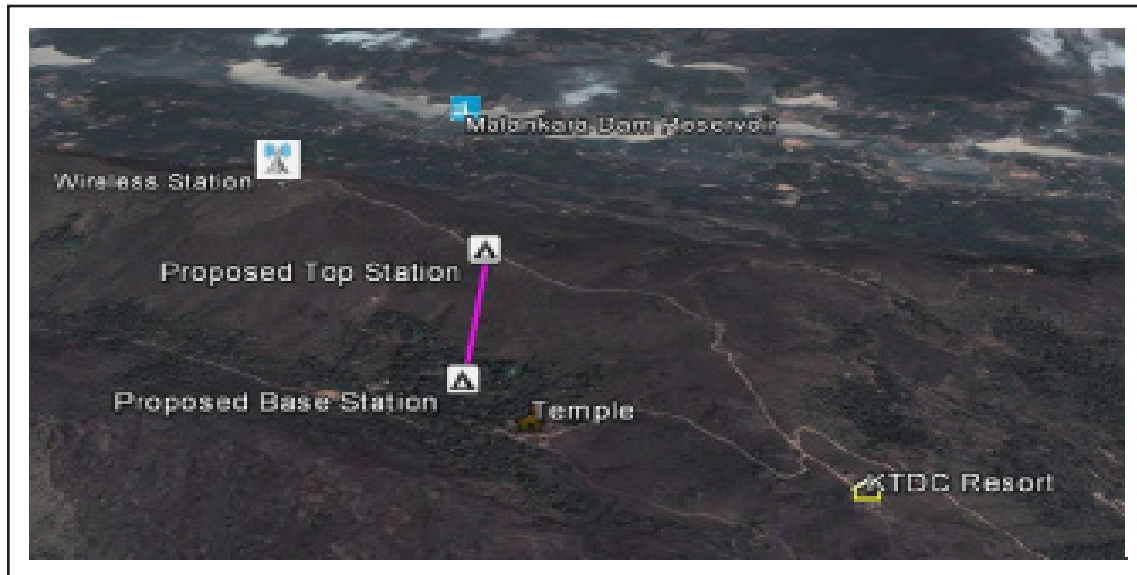
Three alternative ropeway alignments were established connecting the hill top and base camp developments at Ilaveezha Poonchira. The alternate alignments for the proposed ropeway project at Ilaveezha Poonchira are shown in Table below:

**Alternate alignments considered for ropeway system**

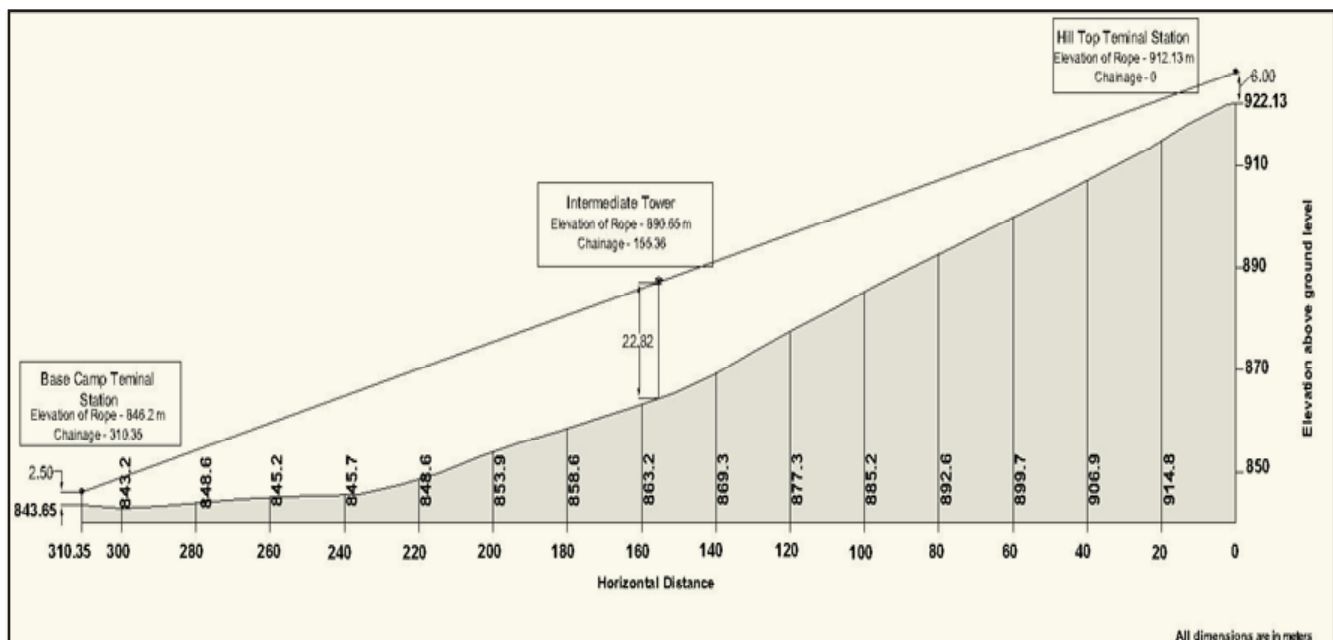
Alignment options	Cable Car terminal station	Geographical Coordinates		
		Latitude	Longitude	Elevation (m) above MSL
Alternative 1	Base camp	9.8031°	76.78249°	840.53
	Hill top	9.8053°	76.78342°	909.30
Alternative 2	Base camp	9.80316°	76.78161°	843.65
	Hill top	9.80655°	76.78128°	939.70
Alternative 3	Base camp	9.80316°	76.78161°	843.65
	Hill top	9.80596°	76.78179°	922.13

The proposed alignment was finalized considering the availability of land for terminal stations, altitude above Mean Sea Level (MSL), ground clearance required, height of trestles, inclination angle of the ropeway and aerial view from the cable car. Based on the technical evaluation, third alternative alignment was considered as the most feasible alignment.

The horizontal distance between base camp terminal station and hill top terminal station will be 310.72m and vertical level difference will be 78.49m. Ropeway connecting both terminal stations will have a length of 320.48m. Height of rope at intermediate supporting tower, at a horizontal distance of 155.5mm from base camp terminal station, will have a height of 23m from ground level.



*Proposed final alignment for ropeway system*



*Profile of proposed ropeway alignment at Ilaveezha Poonchira*

## 1.3 Estimated Cost

The total estimated cost for installing the system worked out to Rs.540 lakhs which include design, electrical and mechanical components and civil works.

### *Broad break-up of cost estimate for installing ropeway system*

Sl. No.	ITEM	ESTIMATED COST (Rs)
1	Design and Engineering	61,00,000
2	Supply of Mechanicals	1,78,00,000
3	Supply of Structurals	1,22,00,000
4	Supply of Electricals	81,00,000
5	Civil Work	43,00,000
6	Erection and Commissioning	55,00,000
	<b>TOTAL</b>	<b>5,40,00,000</b>

## 1.4 Environmental Baseline Data

A study of the existing environmental conditions was carried out. Attributes of the physical environment like air and noise quality in and

around the study area were assessed primarily through field studies and by undertaking air quality monitoring and analysis of samples collected from field and mitigation measures were found out.

### *Recommended Technical Specifications of Ropeway System*

Sl. No.	Parameters	Specifications
1	Type of ropeway system	Fixed Grip type Monocable Zigback Gondola
2	Location of ropeway	Ilaveezha Poonchira
3	Length of track (inclined)	321.35m
4	Vertical rise	81.98 m
5	Alignment	Straight
6	Ropeway carrying capacity	185 Passenger Per Hour (Peak)
7	Ropeway design capacity	450 Passenger Per Hour (Peak)
8	Maximum ropeway speed	2 meter / sec.
9	Average ropeway speed	1.5 meter / sec.
10	No. of ropeway stations	2
11	No. of intermediate towers	1
12	Cabin capacity	4 (four) passengers
13	Number of cabins	6 (Six) Cabins
14	Braking System	(i) Service Brake (ii) Emergency Brake on main drive sheave (iii) Electric stop
15	Drive Station	Base camp terminal station
16	Tensioning	Hydraulic tensioning equipment driven by electricity.
17	Type of grip	Fixed
18	Type of cabins	Enclosed, fully ventilated, glazed and with automatic door opening/closing mechanism. Ventilation scheme to be approved by Engineer-in-Charge.
19	Type of towers	Galvanized, Latticed/Tubular Steel Construction
20	Tower sheaves	Aluminum casted with rubber liners
21	Ropeway stations	Galvanized and welded steel section stations housing the ropeway equipment. All the passenger amenities like waiting rooms, toilets and ticket counters to be provided separately
22	Motor rating required	90 KW
23	Power supply	415V $\pm$ 10%, 3 Phase, 50 Hz. $\pm$ 3%

## 2. TRAINING

### **a) In-house Training**

- Training on PTV VISUM, VISSIM and VISTRO was given to scientists from 6<sup>th</sup> – 9<sup>th</sup> May 2015.

### **b) External Training / Presentations**

- Shri.P.Kalaiarasan, Scientist-C conducted a 'Demonstration on DGPS Applications' to the scientists of NCESS at their request, at NCESS, Thiruvananthapuram on 28<sup>th</sup> April 2015.
- Shri.P.Kalaiarasan, Scientist-C made a presentation on "Sustainable Urban Transport" at Sustainable Development Program organised by IMG, Thiruvananthapuram on 28<sup>th</sup>-30<sup>th</sup> May 2015.



## c) Meetings

- i) Workshop on 'Improvement of Public Transport Services in Thiruvananthapuram City' on 2<sup>nd</sup> May 2015.



*Dr.B.G.Sreedevi, Director, NATPAC welcoming the participants*

- ii) The 17<sup>th</sup> meeting of the Research Council was held on 5<sup>th</sup> – 6<sup>th</sup> June 2015 under the chairmanship of Director, NATPAC.



*Research Council Meeting in Progress*

## d) Road Safety Training for Various Target Groups

- i) 'Road Safety Education Programme for students' as part of Summer Vacation Camp organised by Sree Narayana Gurukulam, Varkala on 6<sup>th</sup> April 2015.
- ii) 'Namukke Yengane Surakshitharakam' for school children as part of Summer School - 2015 organised jointly by Kerala State Council for Science Technology and Environment (KSCSTE) and State Central Library, Thiruvananthapuram on 27<sup>th</sup> April 2015.
- iii) 'Road Safety Education Programme for students' at Mar Thoma Higher Secondary School, Chungathara, Malappuram on 15<sup>th</sup> May 2015.
- iv) 'Safe Driving Skills and Traffic Rules' for drivers at State Excise and Research Centre Academy, Thrissur on 22<sup>nd</sup> – 23<sup>rd</sup> May 2015.
- v) 'Training on Safe Driving Practices and Circulars and Guidelines issued by the Government on Safe Transportation of Educational Institution Buses and Eye Camp' for school bus drivers, conductors and attenders at Ideal International English School, Kuttippuram on 26<sup>th</sup> May 2015.
- vi) Training on Road Safety in connection with the Passing Out Ceremony of 108 Road Safety Wardens of Marthoma Higher Secondary School, Chungathara in association with NATPAC on 19<sup>th</sup> June 2015. The programme was inaugurated by Shri.P.V.Abdul Vahab, Hon'ble MP.

- vii) 'Road Safety Education Programme for students' at Govt. UPS, Poovachal, Kattakkada on 23<sup>rd</sup> June 2015.
- viii) Training on Road Safety for general public in association with Mala Police Station, at Thrissur on 26<sup>th</sup> June 2015.

## 3. EXHIBITIONS

- i) Road Safety Exhibition and audio-visual programmes at Sree Gurukulam Nursing College, Neyyattinkara, 10<sup>th</sup> – 12<sup>th</sup> April 2015.
- ii) Road Safety Exhibition and audio-visual programmes at Govt. Polytechnic College, Neyyattinkara, 12<sup>th</sup> June 2015.

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## റോഡ് മുറിച്ചുകടക്കുമ്പോൾ



### ബാധിക്കുക

- പാതക്കു ചെലുത്തുന്ന വാഹനങ്ങളുടെ ഇടയിലൂടെ റോഡ് മുറിച്ചുകടക്കരുത്.
- നിർത്തിയിട്ടില്ലാത്ത വാഹനങ്ങളുടെ പിന്നിലൂടെ അതിവേഗം റോഡ് മുറിച്ചുകടക്കരുത് റോഡിലേയ്ക്കു അതിവേഗം ഓടിക്കരുത്.
- വളവുതിരുവുകളിൽ റോഡ് മുറിച്ചുകടക്കരുത്.
- നീങ്ങിക്കൊണ്ടിരിക്കുന്ന വാഹനങ്ങളുടെ ഇടയിലൂടെ ഒരിക്കലും റോഡ് മുറിച്ചു കടക്കരുത്.



## സുരക്ഷിതമായി ബസ്സിൽ യാത്ര ചെയ്യുന്നതിന് ചില നിർദ്ദേശങ്ങൾ

- ബസ്സ് പൂർണ്ണമായും നിർത്തിയതിനുശേഷം മാത്രം കയറുക
- നിങ്ങളുടെ ബാഗുകൾ സീറ്റിനടിയിലോ മുകളിലത്തെ റാക്കിലോ സൂക്ഷിക്കുക



### ഓർമ്മിക്കുക

- നിങ്ങളുടെ ഉയരത്തിന് അനുയോജ്യമായ സൈക്കിൾ ഉപയോഗിക്കുക
- തീരെ ചെറുതും വളരെ വലുതും ഉപയോഗിക്കരുത്



## റോഡ് മുറിച്ചുകടക്കുമ്പോൾ



### സിഗ്നൽ ഉള്ള സ്ഥലങ്ങളിൽ

- കാൽനടക്കാർക്ക് പോകാനുള്ള പ്രത്യേക സിഗ്നലിൽ പച്ചവെളിച്ചം തെളിയുന്നതുവരെ കാത്തുനിൽക്കുക.
- പ്രത്യേക സിഗ്നൽ ഇല്ലെങ്കിൽ നിങ്ങൾക്ക് പോകേണ്ട ദിശയിലേയ്ക്ക് വാഹനങ്ങൾ നീങ്ങുമ്പോൾ കരുതലോടെ റോഡ് മുറിച്ചു കടക്കുക.
- എന്നാൽ, നിങ്ങളുടെ പിന്നിൽ നിന്നു നിങ്ങൾ നടക്കുന്ന റോഡിലേക്കു തിരിയുന്ന വാഹനങ്ങളെ ശ്രദ്ധിക്കുക.

പ്രാദേശിക



സംസ്ഥാന

നാലാ

റോഡ് യാത്രയ്ക്കു അനുയോജ്യമായ വാഹനങ്ങളെക്കുറിച്ച്

## 4. TRAINING COURSE FOR DRIVERS OF VEHICLES CARRYING DANGEROUS AND HAZARDOUS GOODS



Dr.B.G.Sreedevi, Director, NATPAC welcoming the participants

Due to unprecedented growth of chemical Industries, the proportion of hazardous chemicals in total freight traffic is increasing at a rapid rate. Of the carriers that carry hazardous goods, approximately two-third of them carry flammable petroleum products including Kerosene, Petrol, LPG, Naphtha etc.





**Inauguration of Training on Safe Transportation of Hazardous Goods to Drivers by Shri. Thiruvanchoor Radhakrishnan, Hon'ble Minister for Transport and Forest, Govt. of Kerala**

The movement of such substances is more prone to accident than the movement of other goods. When involved in a road accident, this may cause disastrous consequences like fire, explosion, injuries etc. in addition to property loss and environmental pollution. Government of Kerala accorded sanction to NATPAC for conducting three day 'Training Course for Drivers of Vehicles Carrying Dangerous and Hazardous Goods' vide G.O.(Rt) No.138/2015/Tran., dated 17<sup>th</sup> March 2015.



**Presidential Address by Dr. Suresh Das, Executive Vice President, KSCSTE**



**Key Note Address by Smt. R. Sreelekha IPS, Transport Commissioner**

The State level inauguration of the programme 'Training on Safe Transportation of Hazardous Goods to Drivers' was done by Shri. Thiruvanchoor Radhakrishnan, Hon'ble Minister for Transport and Forest, Govt. of Kerala on 16<sup>th</sup> April 2015 at Sasthra Bhavan, Pattom, Thiruvananthapuram. The inaugural session was attended by Smt. R. Sreelekha IPS, Transport Commissioner; Dr. Suresh Das, Executive Vice President, KSCSTE; Dr. B. G. Sreedevi, Director, NATPAC and Dr. G. Ravikumar, Scientist - F, NATPAC.

In the technical sessions that followed, presentations in the areas of Accident Scenario, Defensive Driving Techniques, Advanced Driving Skills, Fire Fighting, Class Label, Hazchem Code, Product Information, Emergency Procedure, Driver Fitness and Vehicle Fitness and Driving Emergencies were made. Fire demonstration and Tanker Truck demonstration were also arranged for the participants. 60 drivers participated in the training programme.



**Fire Fighting Demonstration**



**Tanker Truck demonstration**

**Three Programmes were completed during this period.**

- K Karunakaran Transpark, Aakkulam – 21<sup>st</sup> – 23<sup>rd</sup> May 2015.  
48 drivers participated.
- K Karunakaran Transpark, Aakkulam – 16<sup>th</sup> - 18<sup>th</sup> June 2015.  
32 drivers participated.

## 5. ROAD SAFETY YOUTH LEADERSHIP PROGRAMME

NATPAC in association with Kerala State Youth Welfare Board organised a one day Road Safety Youth Leadership Programme for the Public and Youth Associations at Azhoor Grama Panchayath Hall, Kollam on 29<sup>th</sup> April 2015. The programme was inaugurated by Smt.Vijayakumari, Vice President, Azhoor Panchayath. 75 youth co-ordinators including ladies attended the training.

## 6. SAFE ROAD TO SCHOOL

NATPAC in association with Kerala Road Safety Authority organised one day programme on 'Safe Road to School' (SRS) at selected schools. They are:

- i) Govt. U. P. School, Poovachal – 23.06.2015
- ii) Meladoor Govt. Samithy Higher Secondary School for selected Mala Police Circle, Thrissur in connection with the inauguration of School Protection Group – a Kerala Police initiative – 25.06.2015



**SRS Programme at Meladoor Govt. Samithy HSS**



**Road Crossing Wardens at Govt. UP School, Poovachal**

## 7. PARTICIPATION IN WORKSHOPS, SEMINARS / CONFERENCES AND OTHER TRAINING PROGRAMMES

Name of Programme	Organised by	Date	Venue	Participants
<b>Seminars/Conferences</b>				
Society for Automotive Fitness and Environment (SAFE) Annual Convention 2015: Leapfrogging Road Safety: Way Forward	Taj, Kovalam	21.04.2015 – 22.04.2015	Taj Vivanta, Thiruvananthapuram	B.G.Sreedevi
Expert Committee Meeting on 'Preparation of Status of Environment 2015 report'	KSCSTE	23.06.2015	Sasthra Bhavan	P.Kalaiarasan
<b>Workshops</b>				
Financing of State Action Plan on Climate Change in Kerala	UK Dept. of International Development (DFID)	10.06.2015	Taj Vivanta, Thiruvananthapuram	P.Kalaiarasan



## 8. GUIDANCE TO STUDENTS' PROJECT WORK AND THESIS

Name of the Institution	Course	No.of Students	Topic
<b>Director's Office</b>			
National Institute of Technology, Karnataka, Surathkal	M.Tech (Transportn. Engineering)	1	Study on the effect of Geometric Parameters on Road Safety – A Case Study on newly upgraded Highways in Kerala
National Institute of Technology, Kurukshethra	M.Tech (Transportn. Engineering)	1	Utilization of Jarofix and other waste material for road construction
Cochin University of Science and Technology	M.Tech (Transportn. Engineering)	1	Study on the influence of subgrade soil on the strength of inservice flexible pavements
<b>Traffic and Transportation Division</b>			
National Institute of Technology, Kurukshethra	M.Tech (Transportn. Engineering)	1	Quick Response Travel Demand Estimation Techniques for small and medium size towns
National Institute of Technology, Kurukshethra	M.Tech (Transport Engineering)	1	Impact of weather on traffic flow and travel behaviour of commuters in selected corridors in Kerala
National Institute of Technology, Karnataka, Surathkal	M.Tech (Trpt.System Engineering)	1	Parking demand management for Transit Corridors in Trivandrum
National Institute of Technology, Karnataka, Surathkal	M.Tech (Trpt.System Engineering)	1	Assessment of safety of roads in Kerala using iRAP Model
National Institute of Technology, Karnataka, Surathkal	M.Tech (Transportn. Engineering)	1	Parking demand assessment for LRT Stations in Thiruvananthapuram
National Institute of Technology, Karnataka, Surathkal	M.Tech (Transportn. Engineering)	2	Pre-feasibility of Volvo bus operating centre at Chala in Thiruvananthapuram City
Mar Baselios College of Engineering	B.Tech (Civil)	6	Sustainable Transit System for Last Mile Connectivity in an activity centre – Technopark a Case Study
National Institute of Technology, Karnataka, Surathkal and Warangal	M.Tech (Transportn. Engineering)	14	Study of rationalization of bus routes in Thiruvananthapuram City
<b>Traffic Safety and Extension Services Division</b>			
College of Engineering, Kidangoor, Kottayam	B.Tech (Civil)	6	Accident Analysis in Kottayam District using GIS
Pankaj Kasthuri College of Engineering & Technology, Thiruvananthapuram	B.Tech (Civil)	5	Capacity Analysis of SH – 1
St.Joseph's College of Engineering & Technology, Pala	B.Tech (Civil)	4	Parking management system for MG road in Thiruvananthapuram city
St.Joseph's College of Engineering & Technology, Pala	B.Tech (Civil)	4	Intermodal split of goods transportation in Kerala
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	1	Pedestrian accident prediction modeling of selected road stretch in Kerala
Indian Institute of Information Technology and Management- Kerala (IIITM-K)	MSc Geoinformatics	1	Mapping and Temporal Change Analysis of Land Use/ Land Cover and Vegetation Using Remote Sensing and GIS
<b>Highway Engineering Division</b>			
Marian Engineering College, Thiruvananthapuram	B.Tech (Civil)	6	Performance of glass fibre reinforced SMA
SCMS School of Engineering and Technology, Kochi	B.Tech (Civil)	4	Mix design for coir fibre reinforced bituminous concrete

Name of the Institution	Course	No.of Students	Topic
<b>Regional Transportation Division</b>			
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	1	Effect of queuing of buses at signalized intersection
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	1	Planning of lanes exclusive bus on existing carriage way
<b>Water Transportation Division</b>			
St.Joseph's College of Engineering & Technology, Pala	B.Tech (Civil)	4	Estimation of Carbon Credit for Inland Water Transportation of NW3
Muslim Association College of Engineering, Venjaramoodu	B.Tech (Civil)	6	Life Cycle Assessment of Dairy Products, Milma Dairy Plant – A case study
CEPT, Ahmedabad	P.G In Urban and Regional Planning	1	Inland Waterways and its sustainable development

## 9. SPONSORED PROJECTS IN PROGRESS

Sl.No.	Project	Sponsored by
1	Preparation of Comprehensive Mobility Plan for Thiruvananthapuram and Kozhikode cities in Kerala	Public Works Department (PWD)
2	Traffic Survey on NH 966A between Kalamasserry and Vallarpadam in Kerala	National Highways Authority of India (NHAI)
3	Traffic Calming measures for KINFRA park in Palakkad in Kerala	Kerala Industrial Infrastructure Development Corporation (KINFRA)
4	Cautionary signage scheme for NH 66 between Kollam and Alappuzha in Kerala State	Kerala Road Safety Authority
5	Safe Community Programme at Panchayath Level	Kerala Road Safety Authority (KRSA)
6	Safe Road to School Programme	
7	Accident Surveys and Analysis	
8	Impact of Speed Governors on the safety of heavy vehicles and fuel efficiency	
9	Level of compliance of seat belt usage in selected cities of Kerala	
10	Development of GIS based Road Safety Data Base Management System	
11	Application of Intelligent Transport Systems (ITS) for enhancing Road Safety in Kerala	
12	Accident Reconstruction Studies of Selected fatal Accidents	
13	Pedestrian crossing and vehicle conflicts – A case study of selected road stretches in Malabar Region	
14	Road Safety Workshop, Seminars and Training Programmes for Drivers, Public, Traffic Police, Driver Training Colleges etc.	
15	Production and Free distribution of Road Safety Education/Awareness Materials	

## 10. PRESENTATION OF PAPERS IN SEMINARS/WORKSHOPS

**Dr. B.G.Sreedevi,**

***"Infrastructure Development for Capita Region".*** Seminar organised by Builders Association of India, 23<sup>rd</sup> April 2015.



## PAPERS PUBLISHED IN REFERRED JOURNALS

Nija Bind T A, B. G. Sreedevi, Benny Mathews Abraham.

*"Prediction of Structural Performance of State Highway - 1"*, International Journal of Engineering Research and Technology, Vol.4, (5), May 2015.

## 11. INVITED TALKS / MEDIA INTERACTIONS

**Dr. B.G.Sreedevi, Director**  
**Media Interactions**

**Invited Talk**

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. <b>'Road safety'</b>.All India Radio on 30<sup>th</sup> April 2015.</li> <li>2. <b>'Nalla Samariyakkar Ini Pedikkenda'</b>. All India Radio on June 2015.</li> </ol> | <ol style="list-style-type: none"> <li>1. Talk delivered at <b>'Laurie Baker Memorial Lecture'</b>,organised by Swadeshi Science Movement, Kerala at Institution of Engineers Hall, Vellayambalam, Trivandrum, 1<sup>st</sup> April 2015.</li> </ol> |
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## 12. STAFF RETIREMENTS



1. **Shri.Satheish B Nair**, Scientist-F retired from service on 30<sup>th</sup> April 2015



2. **Shri.V.Jayawardhanan**, Technical Officer - IV retired from service on 29<sup>th</sup> May 2015

## DO YOU KNOW

### ● Recycling of Pavement

Recycling of pavement is the process in which the existing pavement materials are reclaimed and re-used after reprocessing for either resurfacing, or repaving, or reconstruction of pavement depending upon the condition of the existing pavement, the nature of the reclaimed materials, the method of reprocessing and the treatment that the pavement requires.

### ● Managing the Reclaimed Bituminous Materials (RBM)

RBM may be obtained from several sources. The most common method is through cold milling operations. Two other sources of RBM are full depth pavement demolition and bituminous plant waste. RBM materials from multiple sources that have different compositions must be processed to create a uniform material suitable for use in new bituminous mixture.

### ● Advantages and Disadvantages of Different RBM Processing Options

Process	Possible Advantages	Possible Disadvantages
Use of Millings without Further Processing	<ul style="list-style-type: none"> <li>● Avoids Further crushing of aggregate particles in RAP, which may allow higher RAP contents in mixes</li> <li>● Lowest cost of RAP processing options</li> <li>● Milling from large projects are likely to have a consistent gradation and asphalt content</li> </ul>	<ul style="list-style-type: none"> <li>● Requires multiple RAP Stockpiles at the plant</li> <li>● Millings from individual projects are different; therefore, when a particular millings stockpile is depleted, new mix designs must be developed with other RAP</li> </ul>
Screening RAP Before Crushing	<ul style="list-style-type: none"> <li>● Limits crushing of aggregate particles in RAP, which reduces dust generation</li> </ul>	<ul style="list-style-type: none"> <li>● Few RAP crushing and screening units are set up to pre-screen RAP</li> </ul>
Crushing all RAP to a Single Size	<ul style="list-style-type: none"> <li>● Allows the processed RAP to be used in many different mix types</li> <li>● Generally provides good uniformity from RAP materials obtained from multiple sources</li> <li>● Large RAP stockpiles can be generated for annual production</li> </ul>	<ul style="list-style-type: none"> <li>● Tends to increase the dust content of RAP stockpiles, which may be used in mix designs</li> </ul>

Source: IRC:120-2015(Recommended Practice for Recycling of Bituminous Pavement)

RAP - Reclaimed Asphalt Pavement

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