

DIRECTOR'S MESSAGE...

With immense pleasure I am presenting before you this Newsletter for the period July to September 2015. The Centre has completed the preparation of Comprehensive Mobility Plan for Thiruvananthapuram and Calicut during this period. Parking has become an ever-increasing challenge in cities and towns. Parking conflict is the most common problem faced by designers, planners and engineers. Acute scarcity of land in Kerala's urban settings has worsened the situation and often cause traffic chaos coupled with hazards to pedestrians. Various planning strategies are being implemented to tackle the situation in major cities, but the situation in Kerala is yet to improve. Identification and development of off-street parking spaces including multilevel parking has to be done at the earliest. The Centre in association with Kerala Road Safety Authority has launched Phase II of the two day Teachers' Training Programme. This issue of 'Mobility' focuses on Parking Management System for major roads in Thiruvananthapuram City.



PARKING MANAGEMENT SYSTEM FOR MAJOR ROADS IN THIRUVANANTHAPURAM CITY

Mahatma Gandhi Road (MG Road) in Thiruvananthapuram city connecting LMS and Attakulangara passes through the city's central areas. High parking demand and absence of adequate off-street parking facilities along this stretch is causing traffic chaos and hazards to pedestrians. To mitigate this problem, suitable parking management plan has to be developed and implemented taking into account the various aspects of transportation problems in this area.

At the instance of Kerala Road Safety Authority (KRSA), NATPAC has prepared a parking management plan along with suitable parking policy framework that could be useful for Thiruvananthapuram city. NATPAC identified problems associated with parking in the influence area of MG road and assessed the extent of parking deficiency and suitable short-term and long-term solutions for parking problems were formulated.

Primary surveys were carried out to ascertain the road network characteristics and parking demand and supply characteristics. Opinion of road users about various aspects of parking development schemes like parking fee, distance to parking lots, etc. were sought. The data collected were systematically analyzed using appropriate scientific methods. Based on detailed assessment of

parking demand and supply characteristics, the parking deficiency was calculated.

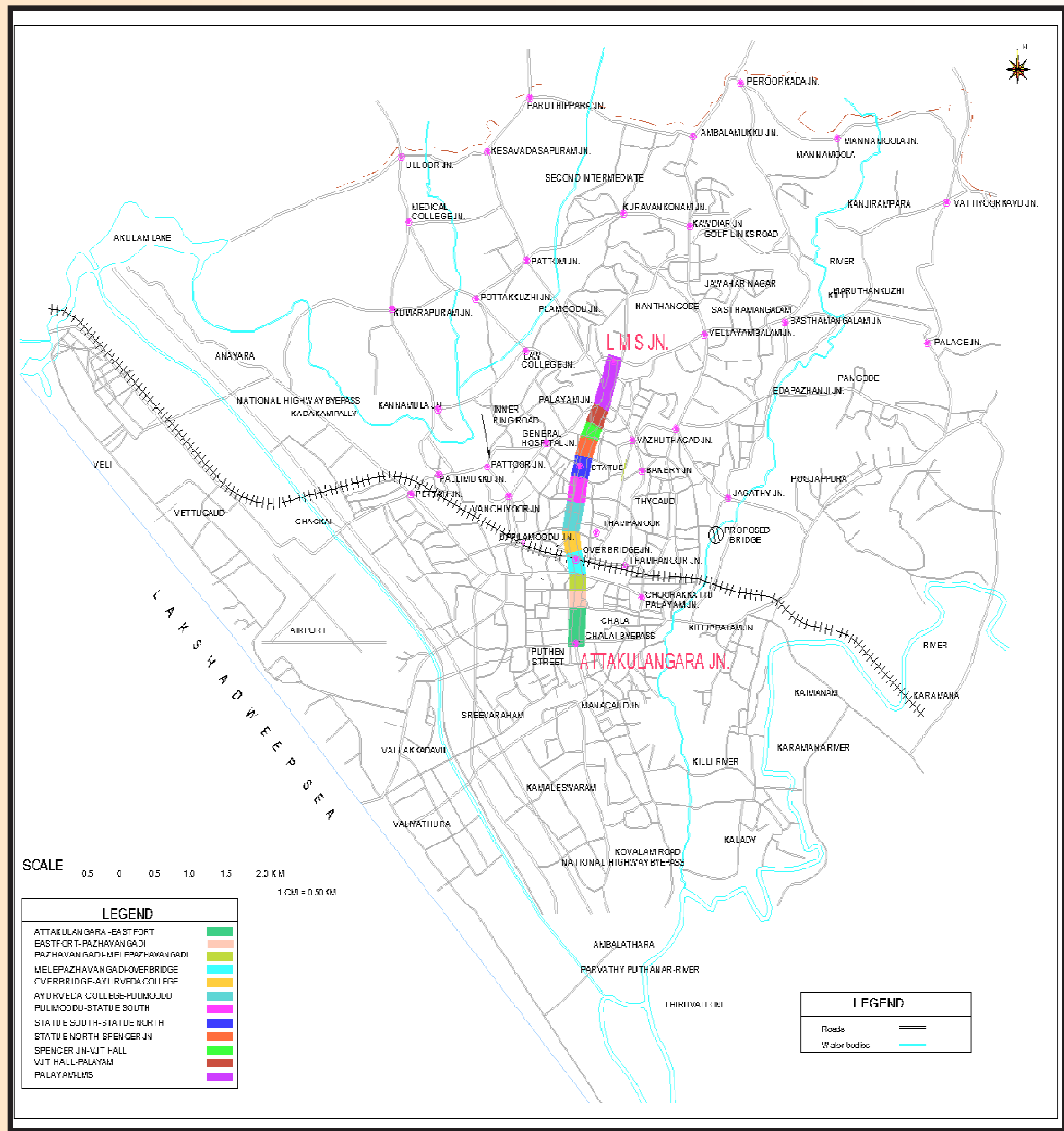
The predominant land use in the influence area of project road was found to be offices and commercial buildings accounting for more than 60% of the total floor area. It has been found that all sections in the study road are operating more than their design capacity during peak hours in the base year.

A total of around 3,400 Equivalent Car Spaces (ECS) off-street parking spaces were available under various land uses on the influence area of M.G road. Only 69 ECS of authorized on-street parking space were available for various types of vehicles in the project influence area. As per the Kerala Municipal Building Rules (1999), the parking requirements along MG road for normal day activities were estimated as 6,681 ECS. The peak on-street and off - street parking accumulation was estimated to be 1,804 ECS and 3,976 ECS respectively within the influence area of MG road. Among the vehicles parked in various sections of the road, 67% were two-wheelers followed by 24% cars. Regarding the duration of vehicles parked, 68% of the vehicles were parked for less than one hour, followed by 17% vehicles parked for 60 to 120 minutes.

Opinion survey was conducted among the private vehicle owners entering the city through major travel corridors. More than 74% of the respondents either strongly favoured or favoured the concept of “park-and-ride” and 72% of the respondents favoured the “car-pooling” concept. Nearly 95% of respondents supported the concept of off-street parking complexes. The catchments area for parking complexes has to be confined to a radius of 100 metres from major traffic generators.

Parking adequacy study was done by analysing the adequacy of effective parking supply against parking demand at both on-street and off-street locations to estimate the requirements of additional parking space. The analysis of aggregate peak parking demand and supply in the study area revealed that there was a parking deficiency of 2,536 ECS in the base year.

Various parking management strategies proposed to reduce parking problems along MG road in Thiruvananthapuram city include:



Map of Thiruvananthapuram City showing project road

- (i) Promotion of public transport and non motorized transport to reduce the parking demand in M.G Road in Thiruvananthapuram city.
- (ii) Integrated parking with public transit terminals by way of park and ride structures to ensure accessibility to parking facilities from bus stops/ MRT stops, IPT modes (Three and Four wheeled autorickshaws, Taxis) has to be developed in an integrated - cost effective - efficient manner.
- (iii) Pedestrianizing important stretches of the core city area and linking them with strategic parking places to encourage people to walk in such areas.
- (iv) Efficient utilization of existing capacity by providing well designed on-street parking lots, better use of off-street space, providing parking information, improving pedestrian facilities and transportation

alternatives, sharing parking space, public parking and valet parking.

- (v) Reduction in parking demand through parking pricing, taxing parking, regulating time of parking, regulating parking of certain vehicles and car sharing.
- (vi) Parking supply management through remote parking, peripheral parking/shuttles, subsidizing off-street parking, preferential parking, zoning regulation and fine-tuning parking requirements.
- (vii) Addressing variable demand by developing overflow parking plans and responding to spill over impacts.
- (viii) Other management options through improving enforcement, safety and security, aesthetics and universal design.

Parking improvement schemes for the MG road is proposed in accordance with latest norms and policies stipulated by Municipal Building rules, IRC and MoUD. As a short-term solution to the parking problems along MG road, on-street parking along MG road was considered. Parallel parking with pricing may be permitted in certain stretches during specified durations from 7.00 pm – 8.00 am. Parking on the link roads leading to MG road were also considered based on availability of road width and traffic considerations. On-street parking supply of more than 1000 ECS could be made available by legalizing restricted duration on-street parking at selected locations on MG-road and on approach roads leading to M.G Road.

Suitable spaces for development of off-street lots were identified through land use surveys. These sites can be later considered for development of integrated parking facilities for mass transit stations along M.G road. In addition to the four locations already identified by Thiruvananthapuram Corporation / TRIDA, additional 65 sites were identified for proposing off-street parking facilities measuring a gross plot area of about 98,000 m². Parking supply equivalent to around 2000 ECS could be provided by developing off-street surface parking lots at the public and private sites identified along the MG road. The feasible off-street surface parking facilities identified can be gradually converted to multi-storied car parking systems considering the parking demand and availability of land. Off-street multi level car parking is proposed at three locations measuring total plot area of around

9,500m² along M.G Road. By providing multi level parking facilities, the parking supply could be increased by 1815 ECS. A total supply of about 400 ECS of parking space in an approximate area of 2,700m² could be provided by the development of automated parking lots at the identified sites.

Apart from development of on-street and off-street parking, parking supply could be increased through the sharing of parking facilities available at the off-street locations of both public and private buildings. This would help in the productive use of available off-street parking areas, which are under-utilized.

By developing off-street surface parking, multi level parking and automated parking systems accompanied with parking controls, the on-street parking on M.G Road can be completely eliminated. Even the enhanced parking supply through the provision of off-street parking system will not be sufficient to meet the growing parking demand. Hence additional measures need to be implemented to control car growth and usage, thereby reducing the parking demand.

The dispersement of activity centers away from the central area of Thiruvananthapuram city will result in reducing the traffic and parking demand along MG road. Adequate parking facilities shall be provided for bicycles and for persons with disabilities. ITS parking systems ensure better utility of parking space and collection of revenue.

Paid parking in the city may be implemented and in order to cater to the demand, differential parking rates for the CBD have been adopted. Pricing for on-street parking should be time based parking fees, favoring short duration parking than long duration parking. It is suggested to levy higher parking fees than normal fees for long duration on-street parking of vehicles and also for peak hours. Off street parking should be priced in such a way to favor long term parking especially daily commuters.



TRAINING PROGRAMMES CONDUCTED

A. IN-HOUSE TRAINING

'Training of Trainers Programme' to scientists organised by the Institute of Urban Transport (India), sponsored by Ministry of Urban Development, Govt. of India under Global Environment Facility (GEF) and UNDP assisted Sustainable Urban Transport Project on 14th – 16th September 2015.



Training in progress



NATPAC Scientists with Officials of Institute of Urban Transport (India)

B. MEETINGS

- (i) NATPAC organised the second Stakeholders meeting as part of preparing a Comprehensive Mobility Plan (CMP) for Thiruvananthapuram City on 6th July 2015 at Mascot Hotel, Thiruvananthapuram. The meeting was inaugurated by Shri V S Sivakumar, Hon'ble Minister for Health and Dewaswom, Government of Kerala.

Shri. N. Seshadri, Vice President, Urban Mass Transport Company Ltd., Bengaluru and Shri.S.Shaheem, Scientist – E1, NATPAC presented the CMP plan to stakeholders. NATPAC came up with a slew of short and long term measures to ensure a safe, secure, efficient and reliable transportation system in Thiruvananthapuram district. The CMP is prepared to plan and organise transport for the growing needs of the State Capital.

The Comprehensive Mobility Plan stressed the need for augmenting KSRTC and for adopting non-motor transportation especially cycles. The Plan also cites the need for providing more infrastructures for pedestrians.



Shri V S Sivakumar, Hon'ble Minister for Health and Dewaswom, GoK; Smt.B.G.Sreedevi, Director, NATPAC; Shri.Sheikh Pareeth IAS and Shri.P.K.Venugopal, Chairman, TRIDA at the Stakeholders meeting for CMP

AMBITIOUS DESIGN

SHORT TERM RECOMMENDATIONS

JUNCTION IMPROVEMENTS PROPOSED AT

- Pallimukku
- Jagathy
- Maruthamkuzhy
- Thirumala
- Pettah
- Vattiyoorkavu
- Vizhinjam
- Kumarapuram
- Pongumoodu

MULTI-LEVEL PARKING COMPLEXES PROPOSED AT

- Chalai KSRTC depot
- Transport Bhavan near the Fort
- Palayam Market
- Railway station
- Statue
- Medical College
- Pattom
- Ayurveda College
- Killipalam Tamil School

PEDESTRIAN INFRA PROJECTS

- 11 underpass/ over pass proposed
- Skywalk proposed at Thampanoor (Railway Station to Bus terminal), Thampanoor to East Fort (via Power House Road), East Fort to Attakulangara bus stand, Ulloor (Light rail station to Medical College),Kazhakootam bus terminal to Technopark
- Pedestrian streets - Chalai Road (Killipalam - Gandhi Park), Temple Road (RTO office - Ramachandran), Temple Road (Padmatheertham Pond road)
- Joggers Path - Kovalam - Veli - Akkulam
- Cycle Track - PMG to Sasthamangalam, Thampanoor to Vellayambalam, NH47 Bypass

LONG TERM RECOMMENDATIONS

NATPAC has recommended three inner ring roads and two outer ring roads in the CMP plan as long term measures

INNER RING ROAD CORRIDOR 1

Thampanoor - Bakery (Flyover) - Palayam (underpass) - Pattoor - Vanchiyoer - Over Bridge - Thampanoor

INNER RING ROAD CORRIDOR 2:

Choorakattupalayam - Thycaud - Vellayambalam - PMG - Thekkumoodu - Kannamoola - Nalumukku - Uplamoodu - Sreekantheswaram - Mele Pazhavangadi - Choorakattupalayam

INNER RING ROAD CORRIDOR 3:

Killipalam - Jagathy - Edapazhinji - Sasthamangalam - Pippinmoodu - Kowdiar - Pattom - Kumarapuram - Enchakkal - Attakulangara - Killipalam

INNER RING ROAD CORRIDOR 4:

Thiruvallam - Kaimanam - Pappanamcode - Thrikannapuram - Thirumala - Vattiyoorkavu - Peroorkada - Ambalamukku - Paruthipara - Kesavadasapuram - Ulloor - Pulayanarkotta - NH Bypass

OUTER RING ROAD CORRIDOR 1

Vazhamuttam - Pachalloor - Poonkulam - Pravachambalam - Kachani - Karakulam - Vattapara - Ayirurpara - Kattayikonam - Vetturoad.

OUTER RING ROAD CORRIDOR 2:

Vizhinjam - Balaramapuram - Uruttambalam - Vellanad - Nedumangad - Kanyakulangara - Pothencode - Mangalapuram

FLYOVERS RECOMMENDED AT

- Kazhakootam
- Sreekaryam
- Ulloor
- Pattom
- Kesavadasapuram
- Thampanoor
- Peroorkada
- Balaramapuram
- Elevated Corridor - Kazhakootam to Enchakkal

NEW BUS TERMINALS

- Kazhakootam
- Vattapara
- Medical College
- Vattiyoorkavu
- Malayinkeezhu
- Balaramapuram

- (ii) As part of preparing a Comprehensive Mobility Plan (CMP) for Kozhikode City NATPAC organised Stakeholders meeting on 10th August 2015 at Alakapuri Hotel, Kozhikode. The meeting was chaired by Dr.B.G.Sreedevi, Director, NATPAC. Shri. S.Shaheem, Scientist – E1, NATPAC presented the final draft report of CMP. Shri.N.Seshadri, Vice President, Urban Mass Transport Company Ltd., Bengaluru presented the short and medium term proposals.

A planned Urban Transport System for Kozhikode was discussed during the meeting. The vision, goal and strategies of CMP were elaborated and the long term traffic improvement schemes proposed for Kozhikode City were discussed. Nearly ₹ 1000 crore has been estimated for the implementation of short, medium and long term projects under CMP.

Short term solutions proposed for the city included development of a parking management strategy, introduction of progressive parking fee for on-street parking, installation of no parking sign boards, segregation of off-parking facilities for auto and taxi, pedestrian facilities like proper maintenance of existing foot path etc.

The medium term proposals included multi-level car parking at Palayam bus stand, pedestrian-cum-cyclist path along the bank of Kallai river from Chakkumkadavu to Mankavu, cycle path of 2.5m on all major roads, foot over bridge and implementation of Intelligent transportation Systems like surveillance cameras, variable message signs, parking guidance system and passenger information system. NATPAC also identified major mobility corridors, suggested mass transit systems like Bus Rapid Transit System and Light Rail Transit System based on the National Urban Transport Policy guidelines.



Meeting in progress



Shri Pradeep, MLA sharing his views

- (iii) NATPAC organised the third Stakeholders meeting as part of preparing a Comprehensive Mobility Plan (CMP) for Thiruvananthapuram City on 9th September 2015 at Sasthra Bhavan, Pattom. Officials representing various Departments/Agencies including Kerala Rapid Transit Corporation Ltd, Thiruvananthapuram Development Authority, Thiruvananthapuram Corporation, Regional Town Planning Office, PWD (NH), TRDCL, Kerala State Urban Development Project, Vizhinjam Port, KINFRA, Southern Railways, KSRTC etc. participated.

Dr.B.G.Sreedevi, Director, NATPAC briefed the major features of the Draft Final Report prepared by NATPAC which was followed by feed backs from the participants. The session was moderated by Shri.P.K.Venugopal, Chairman, TRIDA.



Dr.B.G.Sreedevi, Director, NATPAC presenting the major features of the Draft Final Report



Meeting in progress

PARTICIPATION IN WORKSHOPS, SEMINARS/CONFERENCES AND OTHER TRAINING PROGRAMMES

Name of Programme	Organised by	Date	Venue	Participants
Seminars/Conferences				
Role of Taxation		21.07.2015	Mascot Hotel, Thiruvananthapuram	Dr.B.G.Sreedevi
Meeting on Coastal Vulnerability Assessment & Climate Change Financial Framework Interim Review – State Action Plan on Climate Change Kerala	Dept.of Environment and Climate Change	11.08.2015	Taj Vivanta, Thiruvananthapuram	Dr.B.G.Sreedevi P.Kalaiarasan
Technical Committee meeting on Fixation of DGPS and ETS Technical Specifications	Dept. of Survey and Land Records	17.08.2015	Survey Bhavan	P.Kalaiarasan
Interim Review – State Action Plan on Climate Change Kerala	Dept.of Environment and Climate Change	08.09.2015	Taj Vivanta, Thiruvananthapuram	P.Kalaiarasan
Workshops				
Two Day Workshop on ‘ITS for Road Safety – ITS – Applications, Challenges and Way Forward’		16.07.2015 – 17.07.2015	Regional Institute of Technology, Kottayam	Ebin Sam Anish Kini

NOMINATIONS TO TECHNICAL COMMITTEES/ADVISORY BODIES

P Kalaiarasan, Scientist-C

- ▲ **‘Nodal Officer’** for preparation of Climate Change Report in Kerala to Dept. of Environment and Climate Change (DoECC), Government of Kerala.
- ▲ **‘Technical Expert’** of DGPS and ETS for Dept. of Survey and Land Records, Government of Kerala

PRESENTATION OF PAPERS IN SEMINARS/WORKSHOPS

Dr.B.G.Sreedevi, Seminar on “*Compilation and Formulation of Implementable concepts for developing Trivandrum as green and heritage city*”. Hilton Garden Inn, Trivandrum, 30th July 2015.

GUIDANCE TO STUDENTS' PROJECT WORK AND THESIS

The list of guidance provided by the Scientific Divisions to students from various National Institutes and reputed Professional Colleges during this period is given below:

Name of the Institution	Course	Guide	No. of Students	Topic
National Institute of Technology, Karnataka, Surathkal	M.Tech (Transportn. Engineering)	Dr.B.G.Sreedevi	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)	Dr.B.G.Sreedevi	1	Utilization of Jarofix and other waste material for road construction
Cochin University of Science and Technology	M.Tech (Transportn. Engineering)	Dr.B.G.Sreedevi	1	Study on the influence of subgrade soil on the strength of inservice flexible pavements
Dayanand Sagar College of Engineering, Bangalore	B.Tech (Civil)	Shaheem S	2	Study on the upgradation of bus routes in Thiruvananthapuram
Dayanand Sagar College of Engineering, Bangalore	B.Tech (Civil)	Shaheem S	2	Traffic analysis report for NH-47 in Tamil Nadu
Mar Athenesius College of Engineering, Kothamangalam	B.Tech (Civil)	Salini P N	6	Mode choice for Last Mile Connectivity in Infopark
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	Wilson K C	1	Performance Modeling of Flexible Pavements
Amritha Engineering College, Coimbatore	M.Tech (Transportn. Engineering)	Salini U	1	Study on Recycled Asphalt Pavements
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	V S Sanjay Kumar	1	Modelling the relationships between Highway Geometrics and Accidents
National Institute of Technology, Kurukshethra	M.Tech (Transportn. Engineering)	Salini U	1	Numerical modeling of highway embankment constructed with soil-jarofix mixture

INVITED TALKS/MEDIA INTERACTIONS

Dr.B.G.Sreedevi, Director

Media Interactions

1. 'Road Safety Initiatives'. Kozhikode All India Radio on 26th July 2015.
2. 'Road Safety'. F.M.Radio on 6th August 2015.
3. 'Comprehensive Mobility Plan'. All India Radio on 11th August 2015.
4. 'Comprehensive Mobility Plan'. Asianet, Kozhikode on 11th August 2015.

Invited Talk

'Felicitation Speech'. 'Inauguration of 'Sastra Pratibha Matsaram', organised by Swadeshi Science Movement at Carmel Girls Higher Secondary School, Thiruvananthapuram, 2nd July 2015

Sanjay Kumar V S, Scientist-E1

'Collaborative Research Opportunities'. Government Engineering College, Barton Hill, Thiruvananthapuram, 10th September 2015.

ROAD SAFETY ACTIVITIES CONDUCTED DURING THIS PERIOD

Name of Programme	Venue	Date
Road Safety Education Through Schools In Kerala – Launching of Phase II	Loyola College Campus, Sreekariyam, Thiruvananthapuram.	28 th – 29 th September 2015
Road Safety Youth Leadership Programme	MES Arts College, Valanchery, Malappuram	19.09.2015
	Kerala Law Academy, Thiruvananthapuram	15.07.2015
Safe Community Programme For Panchayaths	Chathannoor Panchayath (Kollam District)	18 th – 20 th August 2015
	Valanchery Panchayath (Malappuram District) at Panchayath Community Hall, Valanchery.	15.09.2015
	Mathilakom Panchayath(Thrissur District) at Block Panchayath Hall, Mathilakom.	28.09.2015
Safe Road To School	Training on Road Safety and Basic First Aid at Town Hall, Thrissur.	22.07.2015
	Government Vocational Higher Secondary School, Ezhuthachan Hall, Chathannoor	19.08.2015
	MES College Auditorium, Valanchery, Malappuram	17.09.2015
	Block Panchayath Auditorium, Mathilakom, Thrissur	29.09.2015
Driving School Instructors Training Programme	Panchayath Community Hall, Valanchery, Malappuram	16.09.2015
International Car Free Day	Ramanilayam road in Thrissur	04.09.2015
Training Course For Drivers Of Vehicles Carrying Dangerous And Hazardous Goods	K Karunakaran Transpark, Aakkulam	14 th – 16 th July 2015
	K Karunakaran Transpark, Aakkulam	4 th – 6 th August 2015
Training On Identification Of Dangerous And Hazardous Goods And Dealing With Emergencies	Sasthrabhavan, Pattom	01.07.2015
	Kochi Range at Central Police Station Conference Hall, Ernakulam	04.07.2015
	Kannur Range at Police Club Conference Hall, Kozhikode	07.07.2015
	Thrissur Range at Police Commissioner Office Conference Hall, Thrissur	10.07.2015
	Kasargod Range at AR Camp Conference Hall, Kasargod	22.07.2015
	Thiruvananthapuram Range at Conference Hall, CPO, Thiruvananthapuram	17.08.2015
	Kannur Range at Police Co-operative Society Auditorium, Kannur	20.08.2015
	Wayanad Range at Mananthavady Police Station Conference Hall	22.08.2015
	Wayanad Range at PWD Rest House, Vadakara	24.08.2015
	Kozhikode Range at Police Club Conference Hall, Kozhikode	25.08.2015

STAFF RETIREMENTS



1. S Ramachandran, Technical Officer Grade – 5 retired from service on 31st August 2015.



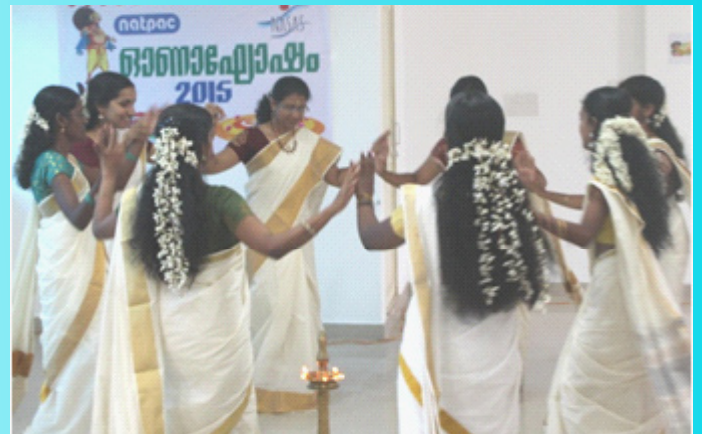
2. Dr. G. Ravikumar, Scientist – F retired from service on 30th September 2015.

OTHER NEWS

- ★ Self help, behaviour, environment, disaster management, spirituality and scientific perspectives on various related topics – Talk delivered by Shri. B K Vedavyas, Member of Prajapita Brahma Kumaris Ishwariya Vishwa Vidyalaya at Sasthra Bhavan, Pattom on 11th August 2015.



- ★ NATPAC Staff Arts and Sports Club (NASAS) organised Onam celebration on 25th August 2015 at K Karunakaran Transpark. Dr.Suresh Das, Executive Vice President, KSCSTE inaugurated the celebration.



- ★ NATPAC took part in Onam pageantry organised by Tourism Department, Government of Kerala on 31st August 2015. The theme of the float was 'Green and Safe Transport'. Street Drama on Road Safety, 'Yathraykkappuram' was also demonstrated for general public.



Float displayed by NATPAC at Onam pageantry



View from Street Drama on Road Safety – 'Yathraykkappuram'

- ★ Recommendation of NATPAC for inclusion of Alappuzha canals sent through the State Government in the 101 National waterway proposal has been accepted by Government of India and the same is included in the waterway Bill.

RECOMMENDATIONS ON THE PROVISION OF PARKING SPACES FOR URBAN AREAS

IRC Standards for Parking Areas for Development (1988)

The following table provides the IRC recommendations on the Provision of Parking Spaces for Urban Areas. The IRC standards may still be used for smaller sized cities/towns in India:

Residential	
Detached, semi-detached and row houses	
Plot Area up to 100 sq.m	No private or community parking space is required
Plot Area 101–200 sq.m	Only community parking space is required
Plot Area 201–300 sq.m	Only community parking space is required
Plot Area 301–500 sq.m	Minimum one-third of the open area should be earmarked for parking
Plot Area 501–1000 sq.m	Minimum one-fourth of the open area should be earmarked for parking
Plot Area 1001+sq.m	Minimum one-sixth of the open area should be earmarked for parking

Flats

One space for every two flats of 50 to 99 sq.m

One space for every flat having 100 sq.m or more floor area

Special, Costly Developed Area

One space for every flat of 50 to 100 sq.m of floor area

One and a half spaces for every flat of 100–150 sq.m of floor area

Two spaces for every flat of above 150 sq.m of floor area

Multi-storeyed, group housing schemes

One space for every four dwellings, except in cities like Calcutta and Bombay where demand may be more.

Offices

One space for every 70 sq.m of floor area

Industrial Premises

One space for upto 200 sq.m of initial floor area. Additional spaces at the rate of one for every subsequent 200 sq.m or fraction thereof.

Shops and Markets

One space for every 80 sq.m of floor area

Restaurants

One space for every 10 seats

Theatres and Cinemas

One space for every 20 seats

Hotels and Motels

Five and Four-star Hotels	One space for every 4 guest rooms
Three Star Hotels	One space for every 8 guest rooms
Two-Star Hotels	One space for every 10 guest rooms
Motels	One space for each guest room

Hospitals

One space for every 10 beds

Source: Special Publication "Tentative Recommendations on the Provision of Parking Spaces For Urban Areas", Indian Roads Congress, New Delhi 1988.

ദേശീയ ഗതാഗത ആസൂത്രണ ഗവേഷണ കേന്ദ്രം

National Transportation Planning and Research Centre
(An Institution of Kerala State Council for Science, Technology and Environment)
Sasthra Bhavan, Pattom -695004, Thiruvananthapuram
Phone:0471-2548200, Director: 2548300, Registrar: 2548310,Fax: 0471-2543677
E-mail: contactus.natpac@kerala.gov.in, Web: www.natpac.kerala.gov.in



NATPAC CAMPUS

K.KARUNAKARAN TRANSPARK, Aakulam,
Thuruvikkal P.O, Thiruvananthapuram.Pincode: 695031
PHONE: 0471 - 2551282 / 2554467 /2553701

REGIONAL OFFICE (KOZHIKODE)

No.19/1429,Chand Nivas, Kottakkal Road,Bajana Koil
Junction,Chalappuram P.O, Kozhikode.Pincode: 673002
PHONE: 0495 - 2305505

Published by

Dr.B.G.Sreedevi,
Director, NATPAC



Edited by

D.Robinson,
Scientist-F, NATPAC