KSCSTE - NATIONAL TRANSPORTATION PLANNING AND RESEARCH CENTRE

KSCSTE-NATPAC

Mobility NEWS LETTER

Volume XIV, Issue 3 *July - September 2016*

Editorial...

Ports are human-built facilities alongside which ships can be loaded or unloaded using cranes or gantries in the case of container ports. A port consists of quays and jetties where ships are tied together with storage facilities for goods; larger ports have transport connections to roads or rail systems. Some coastal ports also have access to waterways or canal systems on which goods can be transported inland by ship, boat or barge. The Vizhinjam International Transhipment Deepwater Multipurpose Seaport is an ambitious project taken up by Government of Kerala. It is designed primarily to cater container transhipment besides multi-purpose and break bulk cargo. The port is being currently developed in landlord model with a Public Private Partnership component on a Design, Build, Finance, Operate and Transfer (DBFOT) basis. According to the project schedule, Phase-1 is expected to be operational by 2019. This project is expected to alter the developmental fortunes of Kerala. Vizhinjam's proximity to international East-West shipping route would results in the reduction of import/export cost. This issue of 'Mobility' looks into the impact caused by the port development on the transport sector in the hinterland areas of Vizhinjam.

1. IMPACT OF VIZHINJAM DEEPWATER INTERNATIONAL MULTIPURPOSE PORT ON TRAFFIC AND TRANSPORTATION SYSTEM

The Government of Kerala (GoK) through its special purpose government vehicle (SPV) - Vizhinjam International Seaport Ltd (VISL), is developing deep water Multipurpose Greenfield Port at Vizhinjam in Thiruvananthapuram, capital city of Kerala. As the port develops, the local area will also get flourished based on the economic development by means of direct and indirect employment. Also the traffic pattern in the surrounding areas will get altered due to the new trips generated as a result of port development. Therefore, a far-vision transportation planning should be done to handle the growth in the traffic movement to ensure a smooth transportation system. NATPAC studied the impact caused by the port development on the road sector in the hinterland areas of Vizhinjam to develop a long term plan for a sustainable road development in the area.

The scope of the study was limited to the proposed Vizhinjam harbour and the surrounding hinterland areas in 10km radius. The hinterland area includes the main urban centres such as Poovar, Kaliyikkavila, Parassala, Neyyattinkara, Balaramapuram and Kovalam.

The main objectives of the study were to:

- Assess the existing traffic flow and road condition in the important road networks in the hinterland areas
- Forecast the quantum of traffic generated during the construction and operational phases

- Establish a trip distribution pattern in the road network for the generated port traffic during the construction and operational phases

- Identify the improvements that are necessary to accommodate the new development and thereby to ensure safe and reasonable traffic conditions

- Develop an action plan to mitigate the impacts caused by the Vizhinjam port on the Transportation scenario.

Reconnaissance survey was conducted to study the details of existing road network on the hinterland areas. The roads that will have a likely impact due to the Vizhinjam traffic were identified. **Figure 1** shows the study area and road networks. Surveys such as volume count survey, road/bridge inventory were conducted in the identified road stretches. Secondary data regarding the projected cargo traffic and the employment activities were gathered from the Vizhinjam port authority. Data from previous studies were collected for determining the commodity distribution pattern. The data collected were analyzed to assess the existing condition of the roads with respect to relevant standards. The traffic data was forecasted by following the four step model of trip generation, trip distribution, mode choice and trip assignment. Finally, the forecasted traffic was assigned on the road networks to quantify the impact considering each phase of port operation and suitable action plans were framed.

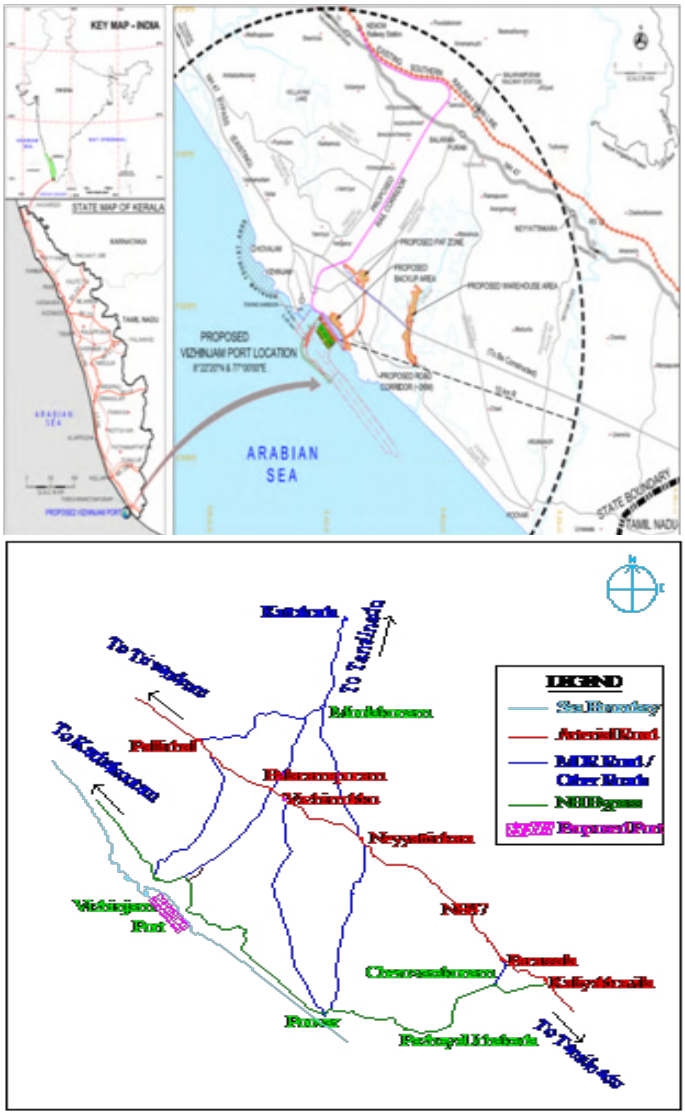


Figure 1: Study Area and Road Networks

Figure 2 shows the existing connectivity of Vizhinjam port with other modes of transport

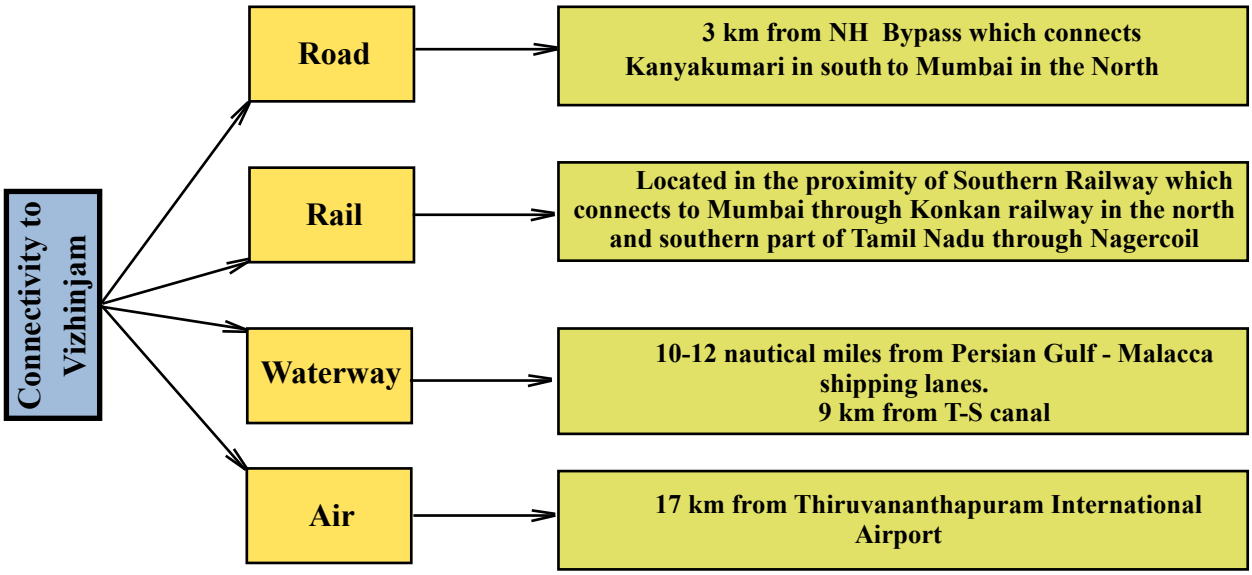


Figure 2: Connectivity to Vizhinjam Port

The VISL is proposed to be developed in three phases. As per the Vizhinjam master plan, the percentage of total container traffic through roads for various phases is as follows

1. 12% in phase I
2. 16% in phase II
3. 19% in phase III

The container Traffic along with generated traffic is assigned to various routes based on the existing commodity distribution of pattern of cargo vehicles. **Table 1** depicts the proportion of traffic assigned to various roads and directions.

Table 1: Traffic Assignment to Various Directions

Link No.	Route	Percentage Assigned
To North Kerala- 47%		
1	Vizhinjam-Kovalam-Thirivananthapuram	36.65%
2	Vizhinjam - Pallichal - Thiruvanathapuram	10.35%
To Thenkasi Direction – 32%		
3	Vizhinjam - Balaramapuram- Moolakonam - Kattakada	32%
To Nagercoil Direction - 21%		
4	Balaramapuram - Vazhimukku - Neyyattinkara- Parasala	6.95%
5	Vizhinjam - Poovar - Cheruvarakonam - Parasala	5.9%
6	NH 66 Bypass -Tamilnadu side	8.15%

Action plans were framed based on the stage-wise port development and operation during the years of 2020, 2030 and 2040.

Immediate Action Plans

- Widening of the existing NH66 from Kaliyakkavila to Thiruvananthapuram from 2 lane carriageway to 4 lane carriageway with service road. This will reduce the v/c ratio of Vazhimukku - Balaramapuram link from 2.85 to 1.19 km and that of Kaliyakkavila to Parassala link from 1.8 to 0.75 kms.

- Vizhinjam – Balaramapuram – Moolakonam road and Parassala – Cheruvarakonam roads have intermediate lane width at present which needs to be widened to 2 lane to achieve a better level of service.

- Major junctions with high urban characteristics are found to be at Pallichal, Vazhimukku, Balaramapuram, Neyyattinkara and Kaliyakkavila. In all these locations, major arm are found to have average road width of 7.5m is observed with no/partial shoulder. Hence, as an immediate action junction improvements have to be undertaken at the road crossings listed in **Table 2** as per IRC standards.

Table 2: Junctions to be improved

Sl. No	Name of the Junction	Intersection Type
1	Pallichal	Y
2	Vazhimukku	Y
3	Balaramapuram	4 arm
4	Neyyattinkara	4 arm
5	Kaliyakkavila	Y

During Phase I Implementation (2020)

- Widening the NH66 bypass (Kaliyakkavila – Mullur – Kovalam – Thiruvananthapuram) from 2 lane to 4 lane
- Increasing the capacity of Cheruvarakonam – Parassala road from intermediate lane to 2lane

During Phase II Implementation (2030)

- Development of Ring road from Mangalapuram to Vizhinjam as proposed in the Comprehensive Mobility Plan for Thiruvananthapuram.
- Widen the 2 lane road from Vizhinjam to Kattakada to a 4 lane road

During Phase III Implementation (2040)

- Upgradation of the existing NH66 bypass to six lane road
- As the entire NH66 will be mostly urbanized, additional land a cquisition to widen this road is difficult and hence alternate way of cargo movement by increasing the rail network and frequency is a feasible solution
- Improvement of waterway network
- Development of Mass transit system along the urban corridors to encourage the use of public transport

2. TRAINING PROGRAMMES CONDUCTED

In-house Training

i) Discussion and demo presentation of Matlab Software to Scientists and Technical Officers by M/s CoreEL Technologies, Bangalore on 31st August 2016.

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

Name of Programme	Organised by	Date(s)	Venue	Participants
Workshops				
SAPCC Review Workshop	Department of Environment and Climate Change	20.08.2016	SP Grand Days, Thiruvananthapuram	V S Sanjay Kumar Wilson K C
National Workshop on 'Google Apps Framework'	Computer Society of India, Tvpm Chapter	27.08.2016	Technopark, Thiruvananthapuram	Sanjai R J Deepa Radhakrishnan
Trainings				
Recent Trends in Transportation Engineering	Dept. of Civil Engineering, NIT, Tiruchirappilli	11.07.2016 -16.07.2016	NIT, Tiruchirappilli	Shaheem S
Online course on 'Geoweb services and Geospatial applications'	Indian Institute of Remote Sensing (IIRS)	28.06.2016 – 15.07.2016		P Kalaiarasan M S Saran Ebin Sam

4. STUDENTS' TRAINING/PROJECT WORK AND THESIS

Name of the Institution	Course	Guide	No.of Students	Topic
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	B Anish Kini	1	Impact of flyover at Kanjikuzhi Junction, Kottayam
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	Chandra prathap R	1	Cost Variation Analysis of Flexible Pavements subjected to Overloaded Trucks
Cochin University of Science and Technology	M.Tech (Transportn. Engineering)	Ebin Sam	1	Blackspot identification in Ernakulam district
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	Salini U	1	Laboratory investigation on zycho-therm modified bituminous mixes
Rajiv Gandhi Institute of Technology (RIT), Kottayam	M.Tech (Transportn. Engineering)	Salini U	1	Characterization of RAP for use of flexible pavement construction

Name of the Institution	Course	Guide	No.of Students	Topic
National Institute of Technology, Kurukshethra	M.Tech (Geotechnical Engineering)	Salini U	1	Numerical modeling of highway embankment constructed with soil-jarofix mixture
National Institute of Technology Calicut, Kozhikode	M Plan (Urban)	Shaheem S	2	Design and Implementation of Traffic Management and Road Safety Measures to Gurgaon City
Cochin University of Science and Technology7	M.Tech (transportation Engineering)	Ebin Sam	1	Blackspot identification in Ernakulam District
Amal Jyothi College of Eng. & Technology, Kanjirappally	B.Tech (Civil)	Shaheem S T Ramakrishnan	3	Traffic and Transportation study for Kattappana Town
Musaliar College of Eng. & Technology, Pathanamthita	B.Tech (Civil)	Salini P N	1	Transportation studies for Harippad Town
LBS college of Engineering, Kasaragode	B Tech (Civil)	Wilson K C	6	Ongoing Activities at NATPAC
Cochin University of Science and Technology	MBA	Sanjai R J	6	Ongoing activities of NATPAC

5. INVITED TALKS/MEDIA INTERACTIONS

Dr. B.G. Sreedevi, Director

Media Interactions

1. Two Wheeler Accidents. All India Radio, Thrissur on 17th August 2016.
2. 'Programme on Road Safety' in Varthatharangini. All India Radio, Thrissur on 22nd August 2016.

Invited Talk

1. 'Safe Road Infrastructure for Zero Mortality', Talk at National Seminar on Trauma Care organized by Indian Medical Association, Thiruvananthapuram, 4th August 2016.
2. Talk on 'Road Safety', organized by Citizen Initiative Trust, Thiruvananthapuram on 7th August 2016.
3. Convocation Address at Vidya Academy of Science and Technology, Thrissur on 27th August 2016.
4. Felicitation Address at the inauguration of the 'SOFT'- Save our Fellow Traveler – an initiative of Kerala Police at Ananthapuri Hospital, Thiruvananthapuram on 3rd September 2016.

Salini P N, Scientist

Invited Talk

1. 'Demand Modelling, Bus Terminal Design and Pavement Design'. Talk delivered at Rajadhani Institute of Engineering and Technology, Attingal, 18th July 2016.
2. Attended as Chief Guest and delivered a Talk on 'Transportation Planning and Management' at the inauguration of Civil Engineering Association at Viswajyothi College of Engineering and Technology, Vazhakulam, 31st August 2016.

Do You Know?

"The Port of Shanghai is the busiest port in the world in terms of cargo tonnage and comprises a deep-sea port and a river port. Located in Shanghai, China, the port covers an area of 3,619 km^2 at the mouth of the Yangtze River. The port is considered the world's fastest-growing economy."

Shanghai Port China

Kandla Port (Gujarat) located on the Gulf of Kutch is the largest port of India by volume of cargo handled.

Jawaharlal Nehru port is the largest container port in India and is also known by Nhava Sheva. It is situated in Maharashtra (Mumbai)

Some Facts About Vizhinjam Seaport...

1. Vizhinjam is an all-weather port located on Southern tip of Indian Peninsula, just 10 nautical miles from the International Shipping Lane, making it capable of tapping the lion's share of Indian transshipment cargo, now being largely handled by Colombo. So once the port is up, Indian exporters will not have to rely on foreign ports for trans-shipment of cargo. It is expected to save at least 1000 crores in expenditure annually

2. Vizhinjam port is endowed with a natural seawater depth of up to 24 m as close as one nautical mile from the seacoast. Due to this natural depth, Vizhinjam can attract the largest container vessels currently in operation and also the future mega container carriers.

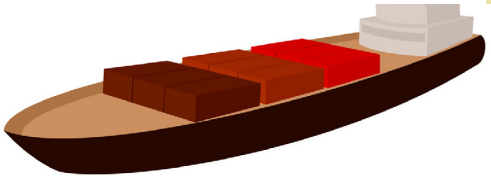
3. Vizhinjam lies Central to the eastern and western coast lines of India and thus can cater to the needs of both west and east coast.

Krishnapatnam Port is now out on its own as the deepest draft port in India, with the port now capable of accepting vessels with a maximum permissible draft of 18 meters.

Ancient Ports...

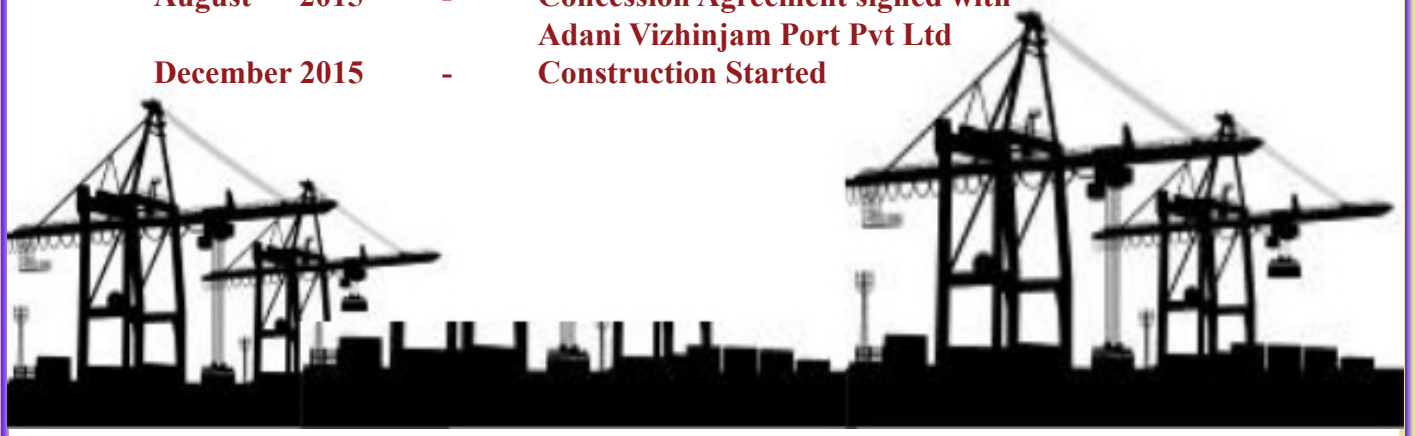
Whenever ancient civilizations engaged in maritime trade, they tended to develop sea ports. One of the world's oldest known artificial harbors is at Wadi al-Jarf on the Red Sea. Along with the finding of harbor structures, ancient anchors have also been found.

Other ancient ports include Guangzhou during Qin Dynasty China and Canopus, the principal Egyptian port for Greek trade before the foundation of Alexandria. In ancient Greece, Athens' port of Piraeus was the base for the Athenian fleet which played a crucial role in the Battle of Salamis against the Persians in 480 BCE. In ancient India, from 3700 BCE, Lothal was a prominent city of the Indus valley civilisation, located in the Bhal region of the modern state of Gujarat. Ostia Antica was the port of ancient Rome with Portus established by Claudius and enlarged by Trajan to supplement the nearby port of Ostia. In Japan, during the Edo period, the island of Dejima was the only port open for trade with Europe and received only a single Dutch ship per year, whereas Osaka was the largest domestic port and the main trade hub for rice.



Vizhinjam, A 200 year old dream

December 2004	-	VISL was formed
August 2015	-	Concession Agreement signed with Adani Vizhinjam Port Pvt Ltd
December 2015	-	Construction Started



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