Enabling Sustainable and Resilient Road Network in The Country

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Abstract- ***In any emerging economies like India, it is imperative that Country develops an efficient, well designed, maintained passenger and freight transportation infrastructure which has enough resiliencies to meet demands of growing economic activities. Such infrastructure naturally demands high degree of investment and production capacity. The developing economies have inherent issue of insufficient resources to meet these challenges. On top of that if there are no synergies between different modes of transportation coupled with poor resiliencies then returns on investment are hard to justify. Therefore, it has become essential that the various modes of transportation must complement each other rather than competing among themselves. Recently, Government of India has embarked upon various ambitious infrastructure programmes in various sectors and resolute upon that these initiatives not only compliments to each other but also help in establishing more commercial centers and act as catalyst to the new urban environment.***

Indexed Terms- ***Transportation, Bharatmala, Sagarmala, Intermodal, Multimodal***

I. INTRODUCTION

India accounts for one of the largest road network in the world. With rapid demand of higher GDP for one of the populous country in the world having population more than 1300 million, the transportation infrastructure bound to create an adverse impact on the Climate. The country need to be built on sound methods of an integrated transportation network so that a perfect synergy is established between the different modes of transport.

Transportation in general and freight transport systems in particular have an important role to play in addressing the sustainability and resilience agenda. However, for this role to materialize, relevant sustainability and resilience criteria need to be integrated and mainstreamed into freight transport planning, policies and investment decisions. Adopting a multi-stakeholder approach involving governments, transport industry, financial institutions and other relevant partners is imperative for these efforts to be successful.

II. INTEGRATIONS OF NATIONAL TRANSPORTATION PROGRAMMES

Various studies showed that the quality and robustness of road transport infrastructure networks greatly impact economic growth, reduce income inequalities and alleviate poverty. Road connectivity has improved across most parts in India, however significant further improvements are yet to be made in the country for fuelling economy growth. Enhancing road transportation infrastructure in India remains an insurmountable challenge as of now. Infrastructure connectivity deals with integration of road networks at various National Highways/Expressways, railheads, major river ports and better access to sea ports via appropriate highways. Regional road network infrastructure projects are usually more complicated and expensive than typical national road infrastructure projects, particularly in the hilly and inaccessible terrains of the country. Intermodal connectivity therefore plays a vital role in seamless movement of people, and goods from one place to another.

2.1 Intermodal And Multimodal Connectivity

Multi Modal Transportation System (MMTS) exploits coordinated and judicious use of multiple modes of transport for faster, safer, and more comfortable movement of people, especially in urban areas. It provides convenient and economical inter-connection amongst various transport modes to provide entire journey from origin to destination in a comfortable and

cost-effective manner. MMTS is traditionally characterized by high capacity, accessible and appropriately located nodes, which integrate various transport modes. This can be achieved by better synchronization amongst various transport modes and provides superior and efficient service.

In India, due to its vast diversity, the Government has been planning and implementing the various routes to achieve the target of integrated road, rail and water transportation network to meet the growing demands of the society. However, since late 1990s, more structured approach has been adopted by way of advent of National Highway Development Project (NHDP) in its various phases, rural road connectivity, dedicated freight corridors through a rail network, Waterways, etc. These networks are being further supplemented through new Industrial zones/hubs to establish a better synergy. Recently, the Bharatmala (an inclusive Road connectivity Programme) understanding of an inclusive growth on a scientific pattern. In a similar fashion, the other programmes like Sagarmala (Water port connectivity) and Dedicated Rail freight connectivity network shall better facilitate the in-built environment required to achieve a more resilient transportation network. The following section describes the various major national programmes undertaken by the Govt. of India to establish a better synergy among different modes of connectivity.

2.1.1 Bhartmala Programme (Road Connectivity Project)

The total length of National Highways in the country now stands at 135 thousand Kilometers. The success of National Highway Development Programme (NHDP) which has been developed in its seven phases has raised the expectation of transportation needs of the Country. Therefore, in order to have a better synergy and resource optimization, the Government of India launched a maiden initiative in the form of Bharatmala Pariyojana (Project) [1]. It is a centrally-sponsored and funded Road and Highways project of the Government of India. The total investment for 84,000 km committed new highways is estimated at ₹5.5 lakh crore (US$76 billion), making it the single largest budget outlay for a government road construction scheme (as of December 2017). The project will build highways from vairuos parts of the country like Gujarat, Rajasthan, Punjab, Haryana and then cover the entire string of Himalayan states - Jammu and Kashmir, Himachal Pradesh, Uttarakhand and then portions of borders of Uttar Pradesh and Bihar alongside Terai, and move to West Bengal, Sikkim, Assam, Arunachal Pradesh, and right up to the Indo-Myanmar border in Manipur and Mizoram. Special emphasis will be given on providing connectivity to far-flung border and rural areas including the tribal and backward areas. Bharatmala Project will interconnect 550 District Headquarters (from current 300) through a minimum 4-lane highway by raising the number of corridors to 50 (from current 6) and move 80% freight traffic (40% currently) to National Highways by interconnecting 24 logistics parks, 66 inter-corridors (IC) of total 8,000 km (5,000 mi), 116 feeder routes (FR) of total 7,500 km (4,700 mi) and 7 north east Multi-Modal waterway ports (Fig.1). It is both enabler and beneficiary of other key Government of India schemes, such as Sagarmala, Dedicated Freight Corridors, Industrial Corridors, UDAN-RCS, Bharat Net, Digital India and Make in India.

2.1.2 Sagarmala Programme (Water Connectivity Project)

The Sagarmala Programme [2] is an initiative by the government of India to enhance the performance of the country's logistics sector. The programme envisages unlocking the potential of waterways and the coastline to minimize infrastructural investments required to meet these targets. It entails investing ₹8.5 trillion (2018) to set up new mega ports, modernizing India's existing ports, developing of 14 Coastal Economic Zones (CEZs) and Coastal Employment Units, enhancing port connectivity via road, rail, multi-modal logistics parks, pipelines & waterways. The Sagarmala Programme is the flagship programme of the Ministry of Shipping to promote port-led development in the country by exploiting India’s 7,500 km long coastline, 14,500 km of potentially navigable waterways and its strategic location on key international maritime trade routes.

Fig. 1 A representative outcome of Bharatmala Project.

2.1.3 Dedicated Freight Corridors (Rail connectivity)

The Ministry of Railways [3] under the direction of the Indian Government, has taken up the dedicated freight corridor (DFC) project. The project involves the construction of six freight corridors traversing the entire country. The main purpose of the project is to facilitate a safe and efficient freight transportation system. In the beginning, the construction of two freight corridors, i.e., the Western DFC connecting the states of Haryana and Maharashtra, and Eastern DFC connecting the states Punjab and West Bengal – is being undertaken. The combined length of the Western and Eastern DFCs will be about 2,800km. The total cost of the project is expected to be estimated at $10bn (2017). The other four corridors include North-South (Delhi-Tamil Nadu), East-West (West Bengal-Maharashtra), East-South (West Bengal-Andhra Pradesh) and South-South (Tamil Nadu-Goa). These four corridors are still in the planning stage.

The DFC project is expected to reduce congestion at various terminals and junctions. It will provide the efficient and fast movement of freight along the corridor not only though the rail network but also shall be supplemented with road/water transports and complemented by dedicated commercial hubs.

III. NETWORK RESILIENCY

In order to streamline the implementation above ambitious programmes, the tailored and targeted policies, regulations, incentives and programmes will be required to promote more efficient, competitive, less energy-intensive and more environmentally friendly freight transportation systems. Various strategies could be pursued to enable sustainable and resilient freight transport systems. Potential areas of intervention include, for example: (a) Integrating transportation and land-use planning; (b) Balancing transport modes; (c) Shifting to lower carbon fuels; (d) Promoting energy-efficient transport technologies; (e) Scaling up investment in transportation infrastructure; (f) Promoting infrastructure maintenance and management; (g) Rethinking supply-chain designs including the location of production sites; (h) Collecting and sharing relevant data and using performance indicators; (i) Reshaping transport architecture and networks; (j) Improving cooperation and stakeholder networking; (k) Promoting trade facilitation measures that reduce border delays and inefficiencies; (l) Rerouting trade to ensure the most energy efficient and less carbon-emitting trajectory.

As regards the sequence required to respond to the climate-change challenge in particular and to build the climate resilience of freight transport systems, a first step would involve enhancing the understanding and technical knowledge among policymakers, transport planners and transport-infrastructure managers of climate change impacts on coastal transport infrastructure, services and operations. The next step would be to strengthen their capacity to make informed decisions and take effective and appropriate climate-policy response and adaptation measures. Conducting risk assessments for critical transport infrastructure and facilities, especially in ports, will be crucial to ensure that adaptation measures adopted are tailored to reflect the local conditions, especially in developing regions. However, to be more effective, enhancing adaptive capacity requires that actions be integrated with other policies such as disaster preparedness, land-use planning, environmental conservation, coastal planning and national plans for sustainable development.

CONCLUSION

The above discussion concludes that the transportation networks require a great deal of understanding the efficacy of each system individually and in a group as well. The reducing the carbon footprints is a paramount to develop new plan and policy.

REFERENCES

[1] Ministry of Road Transport and Highways, concept note and Web site.

[2] Vision, Ministry of Shipping, Govt. of India.

[3] DFCC Web site.