

CIVIL-MILITARY FUSION IN LOGISTICS INFRASTRUCTURE DEVELOPMENT

Col MB Singh*

CMF-Background and Overview

The Civil Military Fusion (CMF) aims at making full use of military and civilian resources under the unified planning and guidance, for achieving the higher state of military preparedness, leveraging **‘Whole of the Nation’** approach. United States defines Military Civil Fusion or MCF (*note the difference in terminology*), as an aggressive, national strategy of the Chinese Communist Party (CCP) with goal to enable the China to develop the most technologically advanced military in the world by eliminating the barriers between China’s civilian research and commercial sectors, and its military and defense industrial complex implementing this strategy, *“not just through its own research and development efforts, but also by acquiring and diverting the world’s cutting-edge technologies – including through theft – in order to achieve military dominance”*. Chinese scholars on other hand credit USA for implementing the concept and claiming to have learnt from it.

Irrespective of how it evolved, USA and China have advanced CMF in all facets of national defence. This fusion helps in, using commercially available off-the-shelf technology, leveraging the synergised strength of the nation for national security by streamlined processes and resource sharing to achieve interconnectivity, higher efficiency, and optimal allocation of resources. Much talked about Chinese MCF called for six System of Systems (SoS) which are formed by fusing civilian and defense ecosystems that possesses high levels of commonality but which have previously been separated into distinct silos. It aims to

gradually integrate military and civilian resources in a way that creates a strategic capability for success in a systems confrontation. Chinese MCF is a strategy whose components are well meshed into China's other national security apparatus to advance the Chinese overarching security and developmental goals. One of the SoS is '*Socialised Support and Sustainment for the PLA SoS*' which is MCF in the area of logistics.

Case for CMF in Logistics Infrastructure in India

Most of our infrastructure development has been taking place in isolated silos. It was marked by lack of coordination between different Ministries/ Departments, for example, once a road was constructed and completed, other agencies dug up the road for activities like laying of underground cables, gas pipelines etc. Piecemeal development of infrastructure took place with complex and fragmented regulatory environment which resulted in wasteful expenditure and suboptimal use of available infrastructure. Government of India (GoI) has been lately working on development of infrastructure in an integrated manner. Minister of MoRTH Shri Natin Gadkari said in Aug 2020 that, "*To take India's infrastructure to the next level it has been decided to work on it in an integrated manner as per Prime Minister Narendra Modi's vision. Plans are afoot to tap full potential while building newer highways.*"

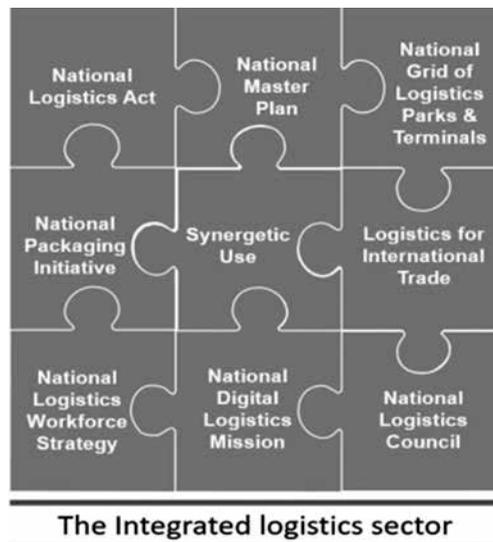


Figure 1 : Ingredients of Developing Integrated Logistics Sector

In recent past number of other path breaking initiatives have been taken by the Gol to, *“Develop a technologically enabled, integrated, cost-efficient, resilient, sustainable and trusted logistics ecosystem in the country for accelerated and inclusive growth”*.

India, 5th largest economy of the world is endeavouring to become a self-reliant USD 5 Trillion economy by 2025. Prime Minister launched National Logistics Policy on 17 Sep 2022 with desired outcome of reduction in logistics cost to 8% which is currently 13% of GDP and to be among top 25 countries by Logistics Performance Index and create data driven decision support mechanism. **While all this transformation is happening in national logistics ecosystem, there a need to dovetail and fuse military logistics infrastructure need in national logistics architecture.**

Transformation of National Logistics Infrastructure

Fastest Segment of Indian Economy. The civil logistics sector has been one of the fastest-growing segments of the Indian economy in recent years. The sector has expanded at a 15 percent compound annual growth rate (CAGR) in revenue in the past five years and is likely to grow at an even faster pace in the future.

PM GatiShakti & National Logistics Policy are a transformative approach for economic growth and sustainable development. The approach is driven by seven engines, which are:-,

- Roads
- Railways
- Airports
- Ports
- Mass Transport
- Waterways
- Logistics Infrastructure

**CIVIL-MILITARY FUSION IN LOGISTICS
INFRASTRUCTURE DEVELOPMENT**

PM GatiShakti. The **PM GatiShakti National Master Plan (NMP)** is aimed at breaking departmental silos and bringing in more holistic and integrated planning and execution of projects with a view to addressing the issues of multi-modal and last-mile connectivity . Launched on 13 Oct 2021, it is a giant stride in India’s ambitious goal for becoming \$ 5 trillion economy. It aims to transform the logistics efficiency and reduce logistics cost, with focus on integrating existing and proposed infrastructure of all developmental agencies, ministries and state governments. NMP will ensure first and last mile connectivity for seamless movement of people and goods. It has also been a transformative approach towards integrated planning and synchronised infrastructure project implementation. Adopting a ‘whole of the government approach’, the NMP has successfully incorporated more than 1900 GIS data layers for infrastructure mapping of different ministries and state governments. In the last one year, the NMP has effectively expedited many projects which had been previously stalled.

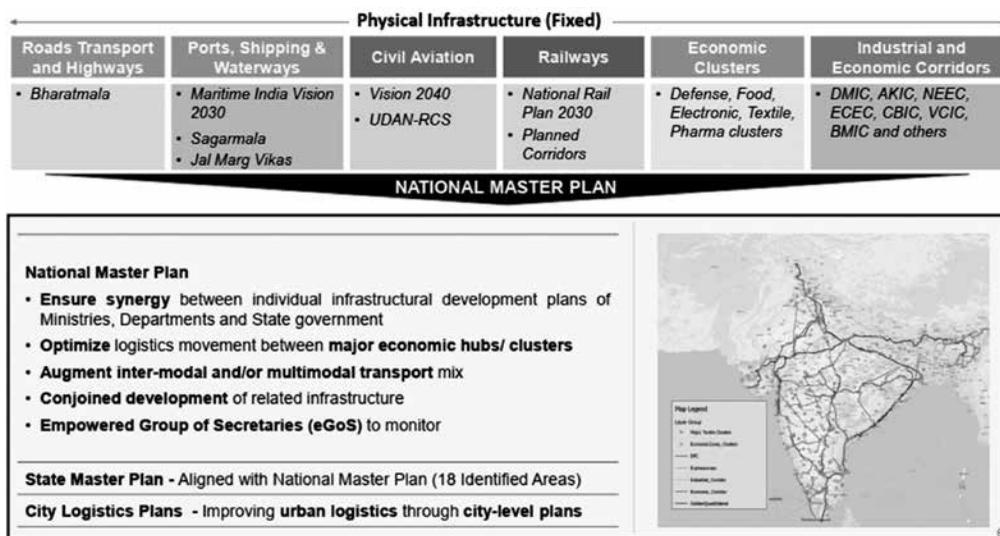


Figure 2 : National Master Plan (NMP)

For supervision and execution of PM GatiShakti, The institutional framework for formulation, implementation, monitoring and support is designed to have a three-tier system. The first tier is Empowered Group of Secretaries (EGoS), headed by Cabinet Secretary, consisting

of Secretaries of 18 Ministries as members and Head of Logistics Division, DPIIT, Ministry of Commerce & Industry as Member Convenor that oversees the formulation and execution of the NMP. Second tier is Network Planning Group (NPG) consisting of heads of Network Planning wing of respective infrastructure ministries and it will assist the EGoS in planning the infrastructure. To avoid duplication of works for holistic development of any region as well as reducing logistics costs through micro-plan detailing, the Technical Support Unit (TSU) is constituted for providing the required competencies which becomes the third tier. It brings together 18 crucial ministries such as railway, road, transport, civil aviation, telecommunications and agriculture for synergised and coordinated creation of infrastructure.

National Logistics Policy (NLP). On September 21, 2022, the Union Cabinet approved the National Logistics Policy (NLP). The policy complements the PM GatiShakti National Master Plan. NLP lays down an overarching interdisciplinary, cross-sectoral, multijurisdictional and comprehensive policy framework for the logistics sector. The NLP aims to develop a technologically enabled, integrated, cost-efficient, resilient, sustainable and trusted logistics ecosystem in the country for accelerated and inclusive growth to reduce logistics cost by 40% from current 13% of GDP by integration, optimisation, standardisation and modernisation of logistics space. This will provide a comprehensive agenda for development of entire logistics ecosystem. NLP is proposed to be implemented through a

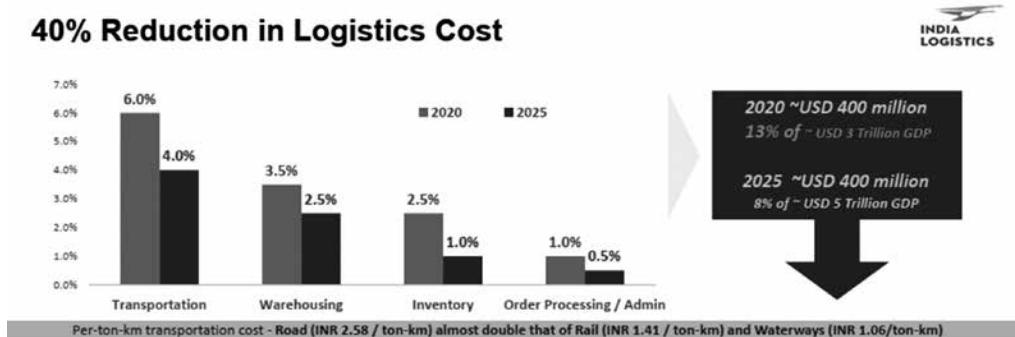


Figure 3 : Logistics Cost as Percentage of GDP in 2020 and Projection for 2025

Comprehensive Logistics Action Plan (CLAP). Action areas proposed in CLAP are:-

- **Integrated Digital Logistics Systems.** NLP proposes to develop a system of unified logistics interface linking multiple data sources and develop cross sectoral use cases for logistics professionals.
- **Standardisation of Physical Assets and Benchmarking Service Quality Standards.** NLP has undertaken to enhance interoperability, minimise handling risks, synergise processes, and improve ease of doing business, through standardisation of physical assets and benchmarking of service quality standards in logistics.
- **Logistics Human Resources Development and Capacity Building.** Develop an overarching logistics human resource strategy and under its guiding principles, stake holding ministries to develop action plans to address skill development.
- **State Engagement.** Provide support for development of state/city level logistics plans, set up institutional framework to take action at city/state level, measure and monitor action by states and rank them.
- **Service Improvement Framework.** Improving regulatory interface to enable seamlessness between sectors, promote standardisation, formalisation, and interoperability; eliminate fragmentation in documentation, formats, processes and liability regimes; and reduce gaps in regulatory architecture.
- **Sectoral Plan for Efficient Logistics.** Sectoral Plans for Efficient Logistics (SPEL) aligned with PM GatiShakti, will be developed for each sector with underlying philosophies of inter-operability, resiliency, sustainability, and innovation. Specifically, SPEL would address logistics issues pertaining to infrastructure, processes, digital improvements, policies and regulatory reforms, and capacity building for better workforce, and prioritise cross-sectoral cooperation to complement and not duplicate efforts and focus on optimisation of modal mix.



Figure 4 : Pillars of Integrated Logistics Development¹⁷

Development of Logistics Parks. Logistics parks (e.g. Multi Modal Logistics Parks, Air Freight Stations, Inland Container Depots, Container Freight Stations, cargo terminals, etc.) will be hubs for intermediary activities (storage, handling, value addition, inter-modal transfers, etc.) in the supply chain connected by a transportation network. It is envisaged to promulgate framework guidelines to facilitate development of Logistics Parks in the country with focus on encouraging private investment, create a network of logistics parks by mapping them on the PM GatiShakti NMP, for enhanced visibility, improved logistics efficiency, optimum utilisation and connectivity.

Military Logistic Infrastructure Voids

Physical Infrastructure especially roads and defence works along international border (IB) and Line of Control (LoC), are somewhat developed, however, our infrastructure along Line of Actual Control (LAC) is far from what is required state of development considering Chinese infrastructure development across LAC. After 1962 war with

China, general thought process of decision makers, political as well military, was that best way to hamper Chinese offensive on own side was by denying axis for developing operations. This was best achieved by deferred and delayed infrastructure development. Shri AK Antony, then RM, in 2010 said that, *“Earlier, the thinking was that inaccessibility in far-flung areas would be deterrence to the enemies.”*

Thought process started changing with formation of China Study Group (CSG) in 1970s; however, the intent of improvement of infrastructure along LAC didn't translate on ground. Though, 73 roads, which are known as India-China Border Roads (ICBR) were conceived in 1997 and approved by CCS in 1999 and were to be completed by 2006. These roads have witnessed many extension of deadline and are yet to be fully completed, reason for which was informed by the BRO to standing committee on Defence in 2018-19. It is beyond doubt that these roads are critical for many purposes in addition to military requirements. Same Standing Committee on Defence noted in its report that border areas, *“which are generally underpopulated, be populated with sympathetic indigenous population. This policy requires a good road network, firstly for motivating migrated population to return to their areas and secondly, for their logistics sustenance.”*

ICBR Phase-2 for construction of additional 104 roads along LAC of approximately 6700 kms, approved in 2020-21 continues to face multiple challenges. Same is the case of Border Airports, ALG projects, Border Bridge Projects, Border Railway Projects, Border Tunnel Projects and Sea Ports & Water Ways Projects of strategic nature. Though completion of LAC projects such as Leh to DBO road in Ladakh, Lipulekh road in Uttarakhand along Nepal border, Damping to Yangtze road in Arunachal Pradesh, Atal Tunnel on Manali to Leh axis, Bogibeel and Sadiya bridges in Assam, Forward ALGs do offer some hope.

General Manoj Pande, the Chief of Army Staff while speaking at **Army Logistics Seminar** on 12 Sep 2022 said that one of the important lessons from Russia-Ukraine war is that **the pace, intensity and reach of military operations ride on strength, agility and capacity of logistics support.** *“While military infrastructure will continue to*

meet the immediate and specific demands of the armed forces, it is the civil-military fusion with the support of Indian industry that shall provide the bulwark for execution and sustenance of future operations,” COAS further added.

Raksha Mantri Shri Rajnath Singh, while delivering key note address at the same seminar **called for Civil-Military Fusion**. He said that, *“The government is taking steps to create a robust, secure, speedy and self-reliant logistics system, with the requisite civil-military fusion, to effectively deal with future security challenges”*.

RECOMMENDATION ON CIVIL-MILITARY FUSION FOR INFRASTRUCTURE DEVELOPMENT

PM GatiShakti Infrastructure Plan targets set by the Indian government till 2024-25 for major infrastructure creation are as follows:-

- **Expanding National Highways.** Extend national highways to 0.2 million kilometres, powered by **Bharatmala**, completing four or six-lane national highways of 5,590 kms along coastal areas and connecting all state capitals in the northeast.
- **Increasing Cargo Capacity.** Railways has a target to handle 1,600 million tonnes of cargo, decongest 51% of the rail network by completing additional lines and implement two Dedicated Freight Corridors (DFCs).
- **Shipping.** Powered by **Sagarmala**, shipping sector to see an increase cargo capacity at the ports to 1,759 million tonne per annum.
- **Doubling the Existing Aviation Footprint.** Powered by **Regional Connectivity Scheme – UDAN**, the Ministry of Civil Aviation, has a target to increase the existing aviation footprint and have a total of 220 new airports, heliports and water aerodromes by 2025 including the development of an additional 109 facilities.
- **Construction of the Pipeline Network.** Doubling the gas pipeline network to 34,500 kms by building an additional 17,000 km long trunk pipeline.

- **Extending the Transmission Network.** The total power transmission network is targeted to be ~0.5 million circuit km and the renewable energy capacity to be increased to 225 GW.

Institutional/Functional Mechanism for Military Infrastructure Requirement Projection. Infrastructure mentioned above are critical, as well for the military and it is imperative that **military requirements are included in the PM GatiShakti NMP ab-initio**. It needs to be done by the **way of inclusion of defence forces representation in the formal consultative mechanism of GatiShakti and NLP**. However, in case creation of institutional mechanism is getting delayed for some reason, **defence forces can formulate its requirements and project to Department for Promotion of Industry and Internal Trade**, Ministry of Commerce and Industry which is nodal department, through MoD/DMA or IDS for functional ease and speed.

Provision for Military Infrastructure in NLP. Similarly, National Logistics Policy is silent on requirement and modalities of construction of logistics infrastructure along border areas. One of the plausible reasons could be its financial viability and return on the investment. It is imminently desirable to formulate defence logistics infrastructure requirements and reach out to Logistics Division, Department of Promotion of Industry and Internal Trade for inclusion of defence forces need in National Logistics Policy. These requirements must be comprehensive, riding on proposed multimodal connectivity infrastructure to various economic zones. Military should also aim to:-

- **Integrate** existing military infrastructure with proposed multimodal infrastructure.
- **Optimise** logistics infrastructure of defence forces with synergistic usage of civil infrastructure.
- **Standardise** our physical assets, seek to update civil standards to suit military requirements and enforce standardisation of processes, taxonomy and service quality standards as being adopted in civil.
- **Formalise** to reduce fragmentation within the Services and with civil logistics sector, up skill and reskill the logistics workforce.

Suggested Inclusion in NLP. Some suggestions for immediate inclusion in logistics infrastructure creation as part of NLP are:-

- **Dedicated zones in proposed logistics parks** for use by military to be catered wherever these are required; or a separate military logistics park, land for which must be acquired along with civil Logistics Park Land, to be created adjacent to civil Logistics Parks.
- **Last mile connectivity to be extended either to border areas** where needed or to an existing road. If last mile connectivity is economically unviable, it should be given capital subsidy.
- **Capital subsidy** to be also provided to logistics companies **for construction of warehouses in remote areas** or an arrangement of clubbing these with profitable location may be resorted to.
- Inclusion of **military logistics infrastructure development parameters** to be included in **LEADS (Logistics Ease Across Different States) Survey** for focus on creation of military infrastructure.

Airfields. More number of Airfield and ALGs are required to be developed in border areas **under UDAN** scheme which can **induce the reverse migration** and also act as dual use infrastructure. For example, ALG proposed to come up in **Tangtse** may be developed as part of UDAN.

Military NPG and TSU for Integrated Infrastructure Development. The concept of NPG and TSU enshrined in NLP and discussed earlier need to be replicated in Border Areas **comprising of civilian and military representatives**, having powers of making decisions pertaining to infrastructure development. This may include the **local formation commanders, engineers from the GREF/ BRO detachment (if stationed), representatives from Navy or Air Force where required** from the military domain and the **representatives of civil administration**.

Dual Purpose Projects. Any project being undertaken in forward location should be considered for feasibility of dual-purpose utilisation, at the planning stage itself.

Use of Tunnels in Border Area for Dual Purpose. Tunnelling is the **only viable point defence** in face of **increasing precision and lethality of warheads**. The **PLA** has built **tunnels** for aircrafts at Lhasa and **underground storage facilities** to store nuclear missile submarines in Hainan Islands in South China Sea . In our case, tunnel based **billeting** and **defences** are required to be constructed, in mountainous areas along LAC. **Provisions of Tunnels for defence works and for storage facility** to be planned **ab-initio**. The same to be provided with **requisite arrangements** for troops during **winters** and also provide security in **CBRN environment**.

Cavern Ammunition Storage Facility. **Conventional ammunition storage** infrastructure in forward areas is prone to enemy **surveillance** and observation during peace and precision strikes during war. We need **underground ammunition storage facilities**, keeping in view the terrain and climate considerations in forward areas. Construction of these will strengthen **defence capability and reduce logistical vulnerabilities**. These facilities must be planned in conjunction with NLP.

Pipeline Network for Fuel. The Indian Oil Corporation Limited is in process of laying pipe lines for supply of fuel to important hubs as part of NLP from where, based on the **Hub and Spoke Concept**, **lines should be laid ahead** to supply **fuel to remote locations**. **This is required to be extended to forward border areas to economise on transportation requirement and create ease and redundancy in supply of Fuel & Oil.**

Critical Pre-requisites. Though not as part of physical infrastructure, however; as critical enablers, military has to upgrade its digital interface and logistics organisation.

- **Logistics Vertical at IDS.** Logistics have achieved fair degree of jointness among the services. In absence of Defence Logistics Agency type of central organisation in India, **logistics vertical at IDS is required to lead the way**. Going forward, **size of logistics vertical at HQ IDS does not complement the role it plays and potential it has**. Logistics vertical at IDS, suitably augmented, to be responsible for centralised policy formulation and coordination of

logistics aspects at tri-services. While the Services can continue to be responsible for their own logistics function, the logistics vertical at IDS to be responsible for:-

- **Coordination with other organs and ministries** of government for factoring in military logistics requirement in creation of logistics infrastructure and ecosystem.
- **Policy intervention** to encourage the civil logistics initiatives in addressing military logistics needs and encourage creation of military logistics ecosystem.
- Optimisation of resources by eliminating duplication in logistic functions, achieving economy of scale and reduce wastage by catering centralised reserves.
- **Digital Interface.** Integrated Material Management On-Line System (IMMOLS) of Air Force, Integrated Logistics Management System (ILMS) of Navy and Computerised Inventory Control Project (CICP) of Army need to be **fully integrated with tri-services seamless interoperability and inventory visibility.** **Digital architecture** to take advantage of **United Logistics Interface Platform (ULIP)**, proposed as part of NLP, has to be developed by the military.

ULIP will help logistic stakeholders in multiple ways. It is in line with the overall objective of PM GatiShakti which aims at breaking individual silos, promote integration among various Ministries/Departments and create a single window thus bringing efficiency and transparency in the logistics industry and thus making India cost competitive and 'Atmanirbhar' in the logistics sector.

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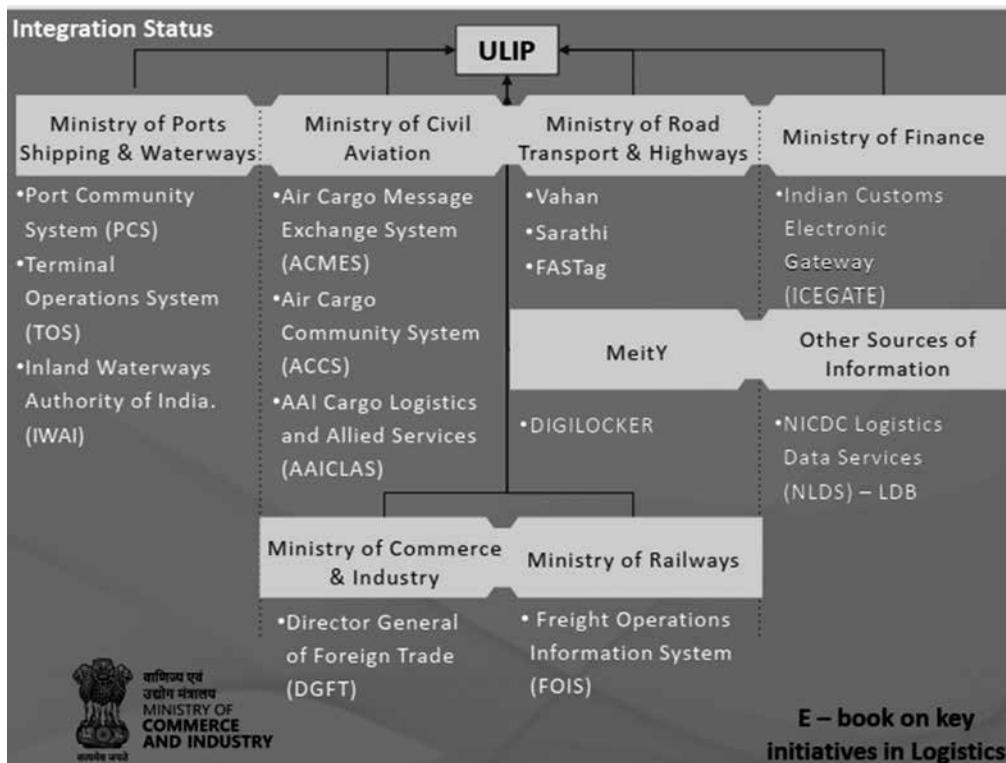


Figure 5 : ULIP Integration Architecture

- Integrated Logistics Organisation.** Some measures like **setting up of Joint Logistics Nodes (JLNs)** at Mumbai, Guwahati and Port Blair have materialised, however, **logistics continues to be planned virtually in Services silos.** Need of the hour is to **evolve an integrated logistics organisation** suitable for **forward linking to Service** while having capability of **being able to fully take advantage of PM GatiShakti and NLP** by **seamless backward integration.**

Conclusion

Logistics efficiency is function of infrastructure, services which includes digital, processes & regulatory services; and Human Resource. The government has been proactively working to bring quantum improvement in logistics infrastructure. For us in military, the need of the hour is

to be innovative which when backed by integrated organisation & effort will become a 'Force for Modernisation'. Proactively reaching out and fusing our requirement with GatiShakti & NLP will plug the military infrastructure gaps in this highly complex and fragmented environment at optimal cost and least burden to defence expenditure.

*Col MB Singh has served along LAC as well as LoC. An alumnus of OTA Chennai, DSSC Wellington and CDM Secunderabad; he was Col GS (Operations) of a Command along Northern Borders. The officer is currently posted as Deputy Commander of a Rashtriya Rifles Sector in North Kashmir. Views expressed are personal.

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