



ASSESSING THE COVID-19 IMPACT ON DEMAND OF FREIGHT TRANSPORT AND ROBUST RESPONSE POLICY RECOMMENDATIONS

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Abstract: In December 2019, the novel SARS coronavirus (SARS-CoV-2) was identified in humans for the first time, with the initial outbreak reported in China. This respiratory virus exhibited a high transmission rate and posed a serious threat due to the absence of any available vaccine or treatment at the time. The World Health Organization declared COVID-19 a public health emergency of international concern. As a result, governments across various regions and countries were compelled to implement strict confinement and lockdown measures to control the spread of the highly contagious virus. These lockdowns significantly impacted multiple sectors, with transportation being among the most immediately and critically affected. The restriction of population movement led to shifts in consumption patterns and disrupted the demand for various goods and materials. Since all sectors are directly or indirectly reliant on freight transportation, the freight industry was among the hardest hit. As the backbone of the global supply chain, the freight transport sector is expected to play a vital role in leading the recovery efforts in the post-COVID-19 era. In light of this, numerous researchers have begun analyzing the pandemic's impact on their respective fields. This paper specifically examines the effects of the COVID-19 pandemic on freight transport demand and proposes robust policy responses to support recovery in the post-pandemic context.

IndexTerms - COVID-19, Freight Transport Demand, Carriage, Response Policies.

I. INTRODUCTION

In December 2019, ground-breaking turbulence of pneumonia of an unknown etiology in Wuhan city, Hubei territory, China, appeared (Nicola *et al.*, 2020). These patients had notable prodromes of dry cough, dyspnea, fever, and bilateral lung infiltrate (Sohrabi *et al.*, 2020). A novel coronavirus was a responsible agent, and the World Health Organisation (WHO) termed it COVID-19. When a patient has this disease, the respiratory viruses are most dangerous; the person-to-person spread of infection can be taking place during the asymptomatic incubation period of 2-10 days (Lai *et al.*, 2020).

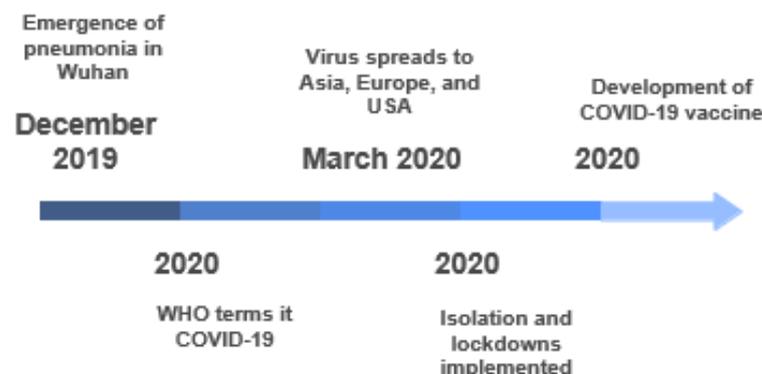


Fig.1: The Global Impact of COVID-19: A Timeline

The World Health Organisation announced the ground-breaking of COVID-19 to be a worldwide emergency health concern, presenting countries with undefended medical management at high risk. Internationally, the number of cases of COVID-19 was increasing with laboratory-confirmed cases (Nadeem, 2020). Isolation and lockdowns were the only ways to interrupt the spread of the virus until the vaccine was developed (Anjum, 2020). The virus affected Asia, Europe, and the USA early in March. The pandemic of COVID-19 has affected each sector at a higher or lower magnitude due to lockdown and border closures (Goutam Sengupta and Bose, 2020). Transportation, hospitality, and aviation are the most affected sectors amid COVID-19 (Wuest *et al.*, 2020).

Various researchers have been working on analyzing the impact of the outbreak on respective fields. This article reviews the effects of the pandemic on freight transport. Freight transport is the transportation of commodities and products in bulk by air, water, or land. Transporting products by road, hiring trucks, vehicle towing services, and keeping a log of the carried/delivered goods are examples of land freight services. Bulk products are transported by huge vehicles on the road. Drivers, vehicles, routes, vehicle service stations, pick-up and delivery places such as warehouses, and freight terminals are all part of the work environment (Ghaderi, Cahoon and Nguyen, 2015). In place of trucks and other loading vehicles, ships and airplanes are used in water and air freight transport. The mounting uncertainty of the COVID-19 pandemic has resulted in severe changes in people's consumption behavior and economic activity. Analyzing the effect of COVID-19 on freight transport turnover is therefore critical. Using available published literature, this paper assesses the state of freight transport during the pandemic and provides direction for future research.

II. LITERATURE REVIEW

Many experts have conducted significant research on the COVID-19 outbreak and its consequences. Several studies explore different industries affected by COVID-19. For example, the Food industry (Mishra and Rampal, 2020), Electrical industry (Fezzi and Fanghella, 2020), Travel industry (Sigala, 2020)(Lee and Chen, 2020), Trade and Market industry (Sha and Sharma, 2020), and labor industry (Yu, Xiao and Li, 2020). The Shutting of cinema halls, declining shopping from complex malls/shopping centers has influenced the retail segment and the utilization pattern of the consumer regarding essential and luxury goods. The rate of dismissal from jobs increased with the slowdown of manufacturing and service activities. It can straightforwardly affect production and transportation, causing lower production, higher prices, and what is called “stagflation” (Maital Ella Barzani, 2020). Besides that, there was a decrease in labor on the supply side due to illness, lockdowns, and quarantine rules (Mahajan and Tomar, 2020). In rising economies, a huge portion of human resources was utilized in small firms (Constantino Hevia, 2020). Fundamental for the supply networks, logistic suppliers are affected by quickly evolving guidelines, for example, mobility restriction and demand shocks (Wuest *et al.*, 2020). The immensity of the economic effect depended on the health crisis's duration and seriousness (Mahendra Dev and Sengupta, 2020). COVID-19 has disrupted the freight transport demand and hence the supply chain.

India had its first corona positive case on 30th January 2020 in the state of Kerala (Ivanov, 2020). China is one of the biggest traders for India, followed by the US and UAE. India accounts for 46% of the imports from China (Forum, 2020). Then, on the demand side, the dropping of export orders served by East Asia further stopped productive exercises, unfavorably influencing the transportation business along with its busiest Asia-Europe and Transpacific courses.

Shortage of labor, extra isolate measures, resultant deferrals in stacking, chop down of ahead rail/street administrations from ports and inland container depots (ICDs)/dry ports/stockrooms upset ordinary activities through multimodal transport systems around the globe (Saul, Dowsett and Baertlein, 2020). All around, cargo carriage by street is found to have decreased by 30-40 percent (Aditi Shah, 2020). The absence of computerized methods and documentation, lack of automated assessment frameworks, and modernized clearance forestall sub regional nations from fulfilling the demand for encouraging the development of even essential goods with decreased ability. Decrease in working hours and lack of staff have constrained the handling ability of ports (Manoj, 2020). Significant ocean ports of the country – Mundra, JNPT Mumbai, Chittagong, Colombo – report accumulating containers as they are not being cleared by the shippers and custom house operators (Suneja, 2020). The epidemic caused uncertainty and economic hardship, but it also provided great possibilities and altered the business climate throughout the outbreak. Communities relied on delivery workers for essential supplies such as food, medical treatment, and cleaning materials. People's altered purchasing habits, increasing demand for delivery services, and online shopping have increased the volume of road freight transport (Liu, Choo and Lee, 2020; Liu, Pan and Yin, 2020; Ho *et al.*, 2021). Sub regional nations rank backwardly in worldwide transport facilitation and confront various specialized, infrastructural, operational, and strategy challenges (European Environment Agency (EEA), 2019). This has called for the guaranteed response policies to the disrupted supply chain.

III. MATERIALS AND METHODS

For this Review research, peer-reviewed papers and articles are thoroughly referred to analyze the disruption in freight transport supply-demand chain due to COVID-19 and to suggest robust response policies.

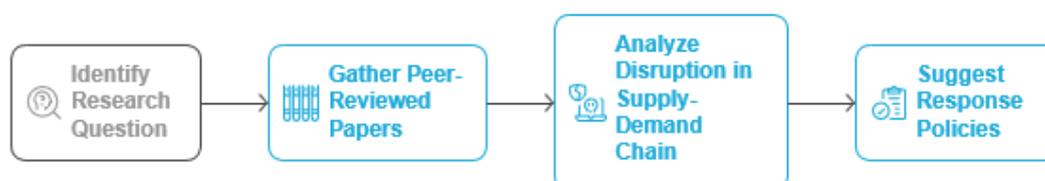


Fig. 2: Research Process for COVID-19 Impact on Freight Transport

IV. POLICY SUGGESTIONS

To minimize adverse outcomes, governments should offer funds to transportation service providers so that they can sustain transportation supply while also observing social distancing measures in vehicles to avoid crowding. There is a need to assess the pandemic risk, prioritize the actions to be performed, and identify the gaps in pandemic preparedness in the transportation business. By analyzing the findings of recent surveys, we conclude that the current status of the country's transportation industry is unlikely to improve even in the post-covid-19 phase without adequate government involvement.

A blend of financial and fiscal upgrades is required. Later on, automation and Artificial Intelligence can reduce the difficulties and be resilient to the transport supply chain (Wuest *et al.*, 2020). A comprehensive package consisting of the extensions such as partial payment of goods and service tax and access credit should be provided to small and medium enterprises. There is a need to identify and secure logistic capacity (Agrawal, Jamwal and Gupta, 2020). It helps to estimate the capacity and accelerate whenever

possible, also resulting in flexible transportation whenever required. There is a need to develop demand forecast strategies that define the time horizon for the demand forecast, which will help in the risk-informed decision for the industries (Agrawal, Jamwal and Gupta, 2020). Existing rail joins along borders for freight development are underutilized in South Asia. Studies on South Asian halls along the Trans-Asian Rail show massive focal points, with certain sub-regional fragments permitting cost-saving up to 80 percent (Gupta, Ayush and George, 2019). The beginning of transporting essential products by rail from India to Bangladesh by the start of May 2020 gives a positive message, underscoring the extremity for scaling up provincial rail transport (*India begins transporting essential commodities to Bangladesh by railways / The Daily Star, 2020*).

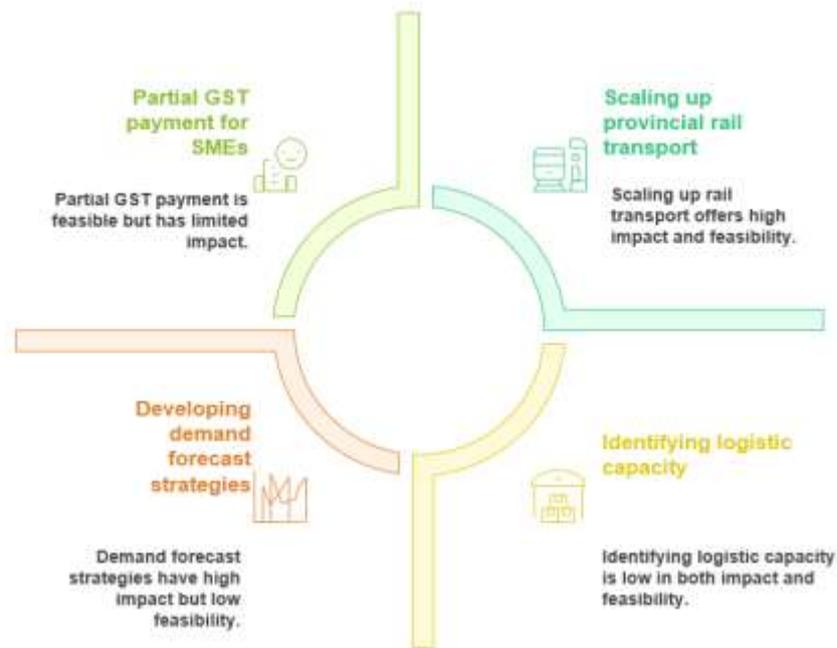


Fig.3: Policy Suggestions: Part I

Further steps should be taken for a regular run of container trains between India and Bangladesh (COVID-19, 2020). The COVID-19 pandemic also has illustrated the complementarity of the transportation and public health systems. Transportation helped spread the virus but also ensured that essential supplies were available. It is evident that transportation engineers must plan for a broader range of potential interruptions than previously anticipated. They must comprehend the several potential consequences on the transportation system. The epidemic will undoubtedly extend concepts of what defines a robust, dependable, and sustainable transportation infrastructure.

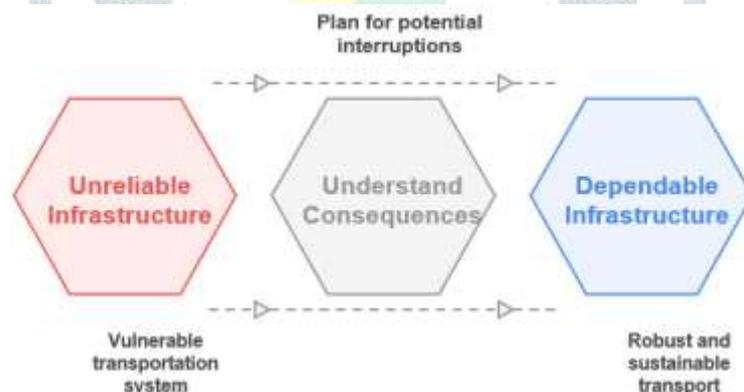


Fig.4: Policy Suggestions: Part II

Following are the steps that other Regions have taken on:

Table 4.1: Measures Adopted by Other Regions

Regions	Measure/s Taken
America	Border policies allow commercial vehicles or others with essential needs to cross the border.
China	<ul style="list-style-type: none"> Financial support to companies influenced by the COVID-19, primarily which are related to daily goods. Encouraged insurance agencies to increase the period of insurance.
Kazakhstan	A law does not require drivers to alter their vehicles while arriving at the border's crossing point.

Russia	<ul style="list-style-type: none"> Decreased insurance premiums for small and medium-sized enterprises. Drivers of international road transport are not required to get isolated if no signs of the disease are detected—no yearly spring limitations on regional roads. Transport companies are not bound to pay the transport tax.
Europe	<ul style="list-style-type: none"> They have to make sure that transport workers can have easy access between their home and workplace. More flexibility to drivers in driving and rest times. Lifting of traffic bans on heavy goods vehicles. Policies have been implied that make sure that sanitary and catering facilities remain available for drivers.

V. CONCLUSION

This paper examines the impact of the COVID-19 pandemic on the supply-demand chain of freight transport and proposes strategic policy responses to enhance recovery and resilience in the sector. The recommended measures include rapid response strategies to restore regular freight operations following pandemic-induced disruptions, encouraging modal shifts through optimal utilization of cross-border rail links, and investing in modern infrastructure to support real-time cargo tracking, streamlined inspection processes, and expedited customs clearance. Additionally, the paper emphasizes the importance of regional cooperation to develop a coordinated approach toward the planning and integration of transport corridors. While the immediate effects of the pandemic on freight transport are evident, the long-term implications for travel behavior remain uncertain. Key questions include whether telecommuting and stay-at-home practices will reduce personal travel in the long run, whether the development of connected and automated vehicles will accelerate, and whether the increased reliance on e-commerce will permanently reshape logistics and delivery systems. These evolving dynamics present important research opportunities for transportation engineering professionals to understand and adapt to the post-pandemic mobility landscape.

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