



Development of a Truck Terminus in Kolhapur through Public Private Partnership: A Feasibility Study

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Abstract: Kolhapur, a key commercial hub in Maharashtra, has experienced rapid industrial growth and urbanization, leading to a surge in freight traffic between Maharashtra, Karnataka, and Goa. Strategically located along major highways, the city lacks a dedicated truck terminus, resulting in haphazard parking, traffic congestion, safety hazards, and environmental issues. The absence of rest areas, fuel stations, and maintenance facilities further hampers the efficiency and well-being of truck operators. To resolve these issues, developing a well-planned truck terminus is essential. A Public-Private Partnership (PPP) model offers a sustainable solution by combining private investment and operational expertise with government support for land, clearances, and basic infrastructure. This model reduces public financial burden, ensures timely execution, and maintains high service standards. Proposed facilities include organized parking bays, restrooms, dormitories, fuel stations, repair workshops, and warehousing units, strengthening the logistics ecosystem. A structured PPP approach ensures balanced public-private interests through transparent revenue-sharing and performance-based contracts. However, a detailed feasibility study is crucial to assess the project's technical, financial, legal, social, and environmental viability. This analysis will help define the optimal PPP framework and guide policy decisions. If viable, the truck terminus will enhance traffic flow, road safety, and logistics efficiency, positioning Kolhapur as a modern logistics hub and supporting long-term regional economic development through improved infrastructure and transportation services.

Index Terms - Public, Private, Partnership, Infrastructure, Project

I. INTRODUCTION

1.1. Truck terminus

A truck terminus is a dedicated facility near highways or industrial zones for truck parking, loading, refueling, maintenance, and driver rest. It improves freight efficiency, road safety, and reduces urban congestion. With amenities like restrooms, eateries, and security, it supports logistics operations and organized urban infrastructure. A truck terminus includes essential facilities to streamline logistics and support drivers. It features organized parking zones, dormitories, restrooms, and 24/7 food courts to ensure safety, hygiene, and comfort. On-site repair workshops, weigh bridges, and fuel stations minimize downtime and ensure regulatory compliance. Security is enhanced through CCTV surveillance, while ATMs and local stores support financial and daily needs. Spare parts outlets and EV charging stations cater to conventional and eco-friendly vehicles. Mechanized loading/unloading docks improve efficiency, and vehicle wash stations with water recycling promote cleanliness. These integrated services enhance operational efficiency and contribute to safer, sustainable freight transport.

1.2. Public Private Partnership

A Public-Private Partnership (PPP) is a collaborative framework between government authorities and private sector entities aimed at delivering public services or infrastructure projects efficiently. This model harnesses private sector investment, innovation, and operational expertise while ensuring that public welfare and policy goals are maintained. The government typically provides regulatory support, land, and oversight, while private entities contribute funding, construction, and management. By balancing risks and responsibilities, PPPs enhance service quality, promote economic growth, and ensure sustainable infrastructure development. Public-Private Partnerships (PPPs) are increasingly adopted as a solution not only to address limited public funding for infrastructure but also to enhance the quality and efficiency of public service delivery. Governments are turning to PPPs due to their ability to mobilize private capital, accelerate project execution, and introduce innovation and accountability into traditionally public sectors. Key benefits include faster infrastructure development, improved risk sharing, cost savings over the project lifecycle, higher service quality, and reduced fiscal pressure on governments. Moreover, PPPs allow governments to focus on regulation and planning while leveraging private sector performance through incentives and competition. However, PPPs are complex, long-term arrangements that require careful planning, transparent contracts, and strong regulatory oversight. Challenges include the high cost of private capital, risks of project failure, limited private interest in high-risk sectors, and potential lack of economic impact without

accompanying reforms. Not all projects are suitable for PPPs, and success depends heavily on selecting appropriate models, managing risks effectively, and aligning public-private objectives within a robust implementation framework.

II. NEED OF THE PROJECT

2.1 Consequences of the absence of a dedicated Truck terminal

Kolhapur's strategic location makes it a vital transit hub linking Maharashtra, Goa, Karnataka, and southern states, driving significant growth in trade and logistics. However, the surge in freight traffic has strained the city's transport infrastructure, leading to major logistical and urban challenges. Core commercial areas like Shivaji Road, Mahadwar Road, Tarabai Road, Shahupuri, and the market yard, located within the densely populated Gaonthan region, suffer from acute congestion due to narrow roads and high vehicle density. From 10:00 a.m. to 8:00 p.m., these zones witness severe traffic snarls caused by overlapping passenger and freight movement, disrupting business and daily life. Industrial expansion in Shirol, Gokul Shirgaon, Kagal MIDC, and Ichalkaranji has further increased truck traffic, overburdening the city's infrastructure. New developments such as IT parks, textile hubs, and corporate offices continue to add pressure. Despite this growth, Kolhapur lacks a dedicated truck terminal, resulting in unregulated roadside parking, pollution, and safety hazards. Truck operators struggle without basic amenities or emergency services. To address these issues, a well-planned logistics park with warehousing, repair facilities, and rest areas is urgently needed. Integrated urban planning and traffic management are essential to ensure safe, efficient freight movement and support Kolhapur's long-term economic and infrastructural sustainability.

2.2 Need and impact of Public Private Partnership

Kolhapur Municipal Corporation (KMC) faces significant financial constraints in funding major infrastructure projects. With a proposed 2025–2026 budget of ₹558 crores and a shortfall of ₹160 crores, compounded by revenue delays and ₹350 crores earmarked for salaries and pensions, limited funds remain for development. Additionally, KMC carries ₹700 crores in loans and liabilities, many of which lack financial transparency. This debt burden, along with bureaucratic inefficiencies such as delayed approvals and fragmented decision-making, hampers timely execution of civic projects. Completed infrastructure often suffers due to poor maintenance stemming from inadequate budgets, leading to rapid deterioration and costly repairs. Public-private partnerships (PPPs) present a strategic solution to these challenges. By attracting private investment and expertise, PPPs ease financial pressure on the government while ensuring efficient and timely project delivery. The private sector introduces advanced technology, faster construction, and better management practices, ensuring projects are completed on time, within budget, and maintained effectively. Private entities also assume operational responsibilities, promoting long-term asset sustainability. One such critical project is a dedicated truck terminus in Kolhapur. Currently lacking, this facility would reduce congestion, improve freight efficiency, and enhance safety. Through a PPP model, the public sector can provide land and regulatory support, while private players invest in infrastructure, technology, and operations. This collaboration ensures a win-win outcome boosting logistics, supporting economic growth, and improving urban quality of life while maintaining public oversight and ensuring financial sustainability for KMC.

III. DATA COLLECTION

3.1 Proposed Truck terminus in Kolhapur

1. Kolhapur Central Truck Terminus (Proposed): Proposed location at junction of NH-4 (National Pune-Bangalore highway) and the road approaching Kolhapur city.

2. Logistics Park and Truck terminal at Hatkanangle (Under discussion): In January 2023, discussions were held regarding the development of a logistics park in Hatkanangle tehsil, near Savarde village. Approximately 400 acres of state-owned land have been identified for this project.

3.2 Public Private Partnership for local Municipal body

The responsibility for approving proposals concerning the development of Small, Large, Mega, and Ultra Mega Logistics Parks, Integrated Truck Terminals, and other logistics-related facilities lies with the designated planning authority specific to the location in question. These authorities are tasked with granting approvals for project layouts, sanctioning building plans, and overseeing any modifications or enhancements to existing proposals. Special Planning Authorities such as the Maharashtra Industrial Development Corporation (MIDC), CIDCO, and MMRDA, along with local municipal bodies, are vested with the authority to plan, promote, and facilitate logistics park developments within their respective jurisdictions. These developments may be undertaken either independently or through collaborative arrangements such as Public-Private Partnership (PPP) models.

3.3 A leading organization involved in truck transport, freight logistics business in Kolhapur

The Kolhapur District Lorry Owners Operators Association (KDLOA), established in 2004 and based in Shahupuri, Kolhapur, is a key organization representing lorry owners and operators in the district. It works for the welfare of its members and the growth of the transport sector, ensuring smooth logistics for manufacturers, traders, and farmers. KDLOA addresses sector-specific issues, advocates for member interests, and promotes development in coordination with other associations. A major initiative is its push for a dedicated truck terminus at the Tawade Hotel area, supported by the Kolhapur Chamber of Commerce and Industries (KCCI). KCCI, a major regional body, represents trade, commerce, industry, banking, services, and transport. It acts as a policy advisory platform and collaborates with district-level associations such as the Kolhapur Engineering Association and Shirol Manufacturers' Association. Together, KDLOA and KCCI aim to enhance infrastructure and economic growth in Kolhapur's transport and industrial sectors.

3.4 Role of KDLOA and other in development of truck terminus through PPP

A) KDLOA has long advocated for a dedicated truck terminus in Kolhapur to meet rising logistical demands. With the project proposed under a Public-Private Partnership (PPP) model, KDLOA's role is vital due to its deep understanding of regional transport needs. To ensure the success of the project, it is essential to conduct detailed consultations with KDLOA's directors and key

representatives. Their insights will help identify practical challenges, offer valuable recommendations, and ensure the proposed infrastructure aligns with the real-world needs of transporters and logistics operators in the region.

B) Local businesses are vital stakeholders in Kolhapur's transport sector. For a successful PPP truck terminus project, conduct thorough consultations—interviews and interactive sessions to gather input, address concerns, and ensure active engagement and support.

3.5 Case study: Khalapur Truck terminus at Raigad, Maharashtra, India

3.5.1 Location: The Khalapur Truck Terminus is strategically located along the Mumbai-Pune Expressway at Survey Nos. 46-47 in Thanenhav-Sarsan village, Khalapur Taluka, Raigad, Maharashtra, covering 10 hectares. It aims to support regional logistics and traffic management.

3.5.2 Purpose: The terminal was developed to reduce congestion on the expressway, improve truck driver welfare, and enhance freight efficiency through organized, sustainable infrastructure.

3.5.3 Key Issues Identified: Challenges leading to the project included illegal roadside truck parking, inefficient logistics flow, driver fatigue due to the lack of rest areas, inadequate amenities for truckers, increased environmental pollution from idling, and the underuse of existing truck-related infrastructure.

3.5.4 Objectives: The project sought to eliminate roadside parking, improve traffic flow and safety, streamline logistics using FASTag-based systems, provide basic amenities like restrooms and dormitories, reduce environmental impact, and generate local economic growth through associated commercial activities.

3.5.6 Development Process: Developed under a PPP-BOT model, MSRDC led initial studies, land acquisition, and approvals, while M/S Vikram Telematics handled funding, construction, and operations. Smart infrastructure like RFID and CCTV was integrated, and the private partner generates revenue through parking, fuel sales, and leases, sharing a portion with MSRDC.

3.5.7 Infrastructure: The terminus includes parking for over 500 trucks with streamlined access lanes, rest and medical facilities for drivers, FASTag-enabled entry and exit, 24/7 CCTV surveillance, commercial areas with eateries and shops, as well as fuel and repair stations.

3.5.8 PPP Framework: The project followed a Design-Build-Finance-Operate-Transfer (DBFOT) model. MSRDC provided land and oversight, while M/S Vikram Telematics financed, constructed, and manages operations for a concession period, ensuring quality service delivery.

3.5.9 Stakeholders & Roles: MSRDC ensured strategic alignment and regulatory compliance; the private developer funded and built the facility; trucking associations promoted usage and advised on needs; local communities were engaged for support and job creation; and financial institutions provided loans with repayment tied to project revenue.

3.5.10 Financials: With a total cost of ₹180 crores, the project was financed through land support from MSRDC, major capital investment from the private partner, and Viability Gap Funding (20–30%) from the central government. Revenue streams include parking, commercial rentals, fuel sales, repair services, and rest facilities, with a 30-year concession and 15–20% revenue share to MSRDC.

3.5.11 Risks & Mitigation: Financial risks were mitigated by diversifying revenue; operational risks addressed through performance-linked contracts; and community resistance reduced through local employment and engagement initiatives.

3.5.12 Challenges: The project faced delays in land acquisition, difficulties in aligning diverse stakeholders, socio-political opposition over environmental and traffic concerns, and the need for continuous performance monitoring to maintain service standards.

3.5.13 Impact: The terminal significantly reduced illegal truck parking and traffic congestion, improved safety and logistics efficiency, enhanced driver well-being, generated stable revenues, created local jobs, and contributed to environmental sustainability by cutting emissions from idling vehicles.

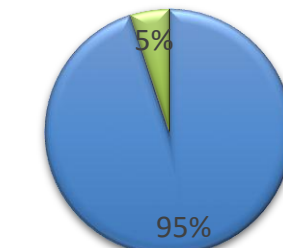
3.5.14 Key Lessons: Effective risk transfer under the DBFOT model, diversification of revenue through commercial services, early and continuous stakeholder engagement, and a focus on trucker welfare were critical to project success and long-term adoption.

3.5 Questionary Analysis

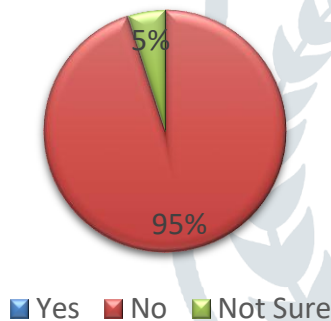
Q. Would your association support a Public-Private Partnership (PPP) model for the development of the truck terminus?



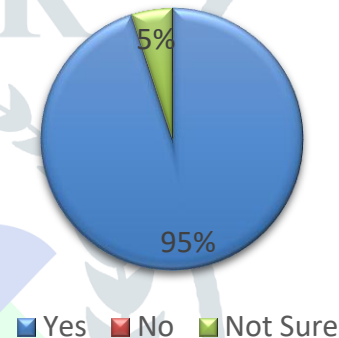
Q. Would your members be willing to pay nominal fees for using the truck terminus if it offers essential services?



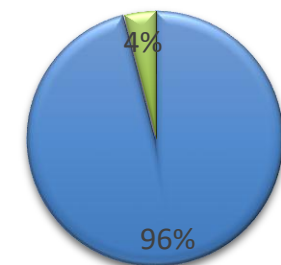
Q. Do you believe that the government is prepared to allocate the necessary funds for this project?



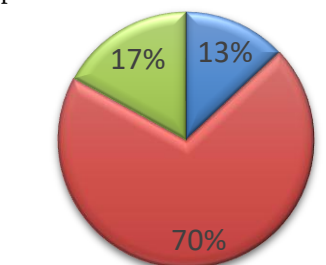
Q. Would your association be willing to participate in the operation and management of the terminus?



Q. Is your association interested in participating as a partner in the development of the project?



Q. If another private sector party is involved under the PPP arrangement, would your association support their participation?



Illustrating the responses of stakeholders KDLOA and local business owners etc. regarding development of Truck Terminus through P.P.P. at Kolhapur.

IV. DATA ANALYSIS

4.1 Technical Feasibility

4.1.1 Land Availability: The approved 2031 Development Plan for Kolhapur city, titled "मंजूर विकास योजना - कोल्हापूर (दुसरी सुधारित)," reserves specific land parcels U.R.S. No. 101 (3024), 103 (3031), and 123 (2011, 3020)—for the Kolhapur Truck Terminus under

1. **Prime Transport Corridor:** Located on NH-48 (Golden Quadrilateral), the site ensures seamless interstate connectivity and serves as a key stop for heavy freight traffic.
2. **City Edge Advantage:** Positioned outside Kolhapur, it diverts trucks from urban roads, easing congestion and reducing urban pollution.
3. **Proximity to Industries:** Close to Shirol, Kagal, and Gokul Shirgaon MIDCs, supporting efficient freight staging and logistics.
4. **Multimodal Connectivity:** Well-connected to rail, air, and regional roads, enabling smooth goods transfer across modes.
5. **Lower Environmental Impact:** Keeps heavy traffic out of city core, reducing emissions, noise, and improving urban liveability.



4.1.3 Design & Infrastructure requirements: Kolhapur's rising interstate traffic and industrial growth have caused severe congestion in its Gaonthan region. To address this, the Kolhapur Municipal Corporation has proposed a dedicated truck terminus

on a 20-acre reserved site. With a planned construction area of 9,181.81 sq.m, the project aims to decongest the city by diverting heavy vehicles from core areas, improving traffic flow and supporting urban infrastructure.



Figure 3 Propose layout of Truck terminus

The proposed truck terminus will feature comprehensive infrastructure across five key categories to enhance efficiency, safety, and comfort. Parking and operational infrastructure will include extensive parking areas, dedicated truck bays, and organized loading/unloading zones to ensure smooth vehicle movement, prevent roadside parking, reduce delays, and improve overall logistics efficiency. Administrative and commercial services such as administrative offices, transport offices, banking facilities, and security stations will help coordinate freight movement, manage documentation, and provide essential financial and security services. Driver amenities and living facilities will offer residential and lodging spaces along with clean, accessible toilet blocks, ensuring drivers have a safe and comfortable place to rest and meet hygiene needs. Supportive services and utilities like dhaba-style restaurants, warehouses, automobile shops, workshops, service stations, vulcanizing centers, and fuel stations will provide affordable meals, vehicle maintenance, and continuous fuel availability, helping minimize downtime. Finally, safety and emergency services will include a first aid center with trained staff to handle medical emergencies, respond quickly to fire incidents, and ensure overall safety at the site.

4.2 Legal and Regulatory Feasibility

4.2.1 Land ownership: The 2031 Development Plan of Kolhapur, titled "मंजूर विकास योजना - कोल्हापूर (दुसरी सुधारित)" under Sections 28(4) and 30 of the MRTD Act, 1966, designates specific land parcels for public infrastructure, including the Kolhapur Truck Terminus under the Transportation and Communication category, as per Map No. DPK 1113B/94. The land falls within Kolhapur Municipal Corporation's jurisdiction, which holds full legal and developmental rights. The site has a clear, marketable title, free of encumbrances, ensuring smooth statutory approvals. Financial institutions have expressed interest in supporting the project, enabling timely construction in line with urban planning norms.

4.2.2 Public Private Partnership framework: The Kolhapur Municipal Corporation (KMC) has a proven track record of implementing large-scale urban projects through the Public Private Partnership (PPP) model. Successful examples include the 76 MLD STP at Kasaba Bawada and the 17 MLD STP at Dudhali, both addressing pollution in the Panchganga River. These projects showcased financial sustainability via Viability Gap Funding, private sector efficiency, and timely execution. With its experience in managing complex PPP contracts and delivering impactful outcomes, KMC is well-equipped to develop the proposed Kolhapur Truck Terminus under a similar PPP framework.

4.3 Financial Feasibility

4.3.1 Capital cost estimate: As part of its City Development Plan 2031, the Kolhapur Municipal Corporation proposed a truck terminus on a 20-acre plot, with an initial estimated cost of ₹8.45 crores in 2012. Considering inflation, the cost has been revised using a 4% annual rate over 13 years, based on RBI's 2025–26 CPI projections. Using the compound interest formula, the updated cost is approximately ₹14.70 crores. This revision ensures accurate budgeting and aligns the project's financial planning with current economic conditions and construction standards.

4.3.2 Revenue streams: The Kolhapur Truck Terminus is expected to generate revenue through diverse streams across key infrastructure components. Parking and operational facilities will bring income from truck parking fees and loading/unloading charges. Administrative and commercial areas will earn through office space rentals and banking/ATM commissions. Driver amenities will generate revenue via lodging charges and pay-per-use sanitation facilities. Supportive services, including restaurants, fuel stations, and service centers, will contribute through rentals, revenue-sharing models, and service commissions. Additional income will come from leasing space to mechanics, tire and spare parts shops, as well as warehouse rentals for logistics firms. Retail space for mini shops offering daily-use items will provide further earnings. These combined revenue streams will ensure financial sustainability and effective operation of the terminus.

4.3.3 Funding source available: KDLOA has actively supported the development of a dedicated truck terminus in Kolhapur, emphasizing its importance for addressing local logistical challenges. Their involvement is essential due to their expertise in transport issues. Detailed consultations with KDLOA representatives provided valuable insights, especially on capital cost estimates, revenue streams, and the PPP structure, which are crucial for evaluating the project's feasibility and ensuring it meets practical needs.

1. The Kolhapur District Lorry Operators Association (KDLOA) is committed to leading the development of a truck terminus through a Public-Private Partnership (PPP), reflecting their dedication to improving regional logistics infrastructure. All key representatives and directors unanimously support the project, both in principle and financially, signaling a collective effort to address transportation challenges and enhance operational efficiency in Kolhapur.

2. Viability Gap Funding (VGF) can significantly aid in making truck terminus projects financially viable. These infrastructure projects, crucial for logistics and transportation, often struggle with high capital costs and low direct revenue generation. The VGF mechanism can provide up to 40% of the project cost as a capital subsidy—20% from the Central Government and 20% from the State Government—making it attractive for private developers. This funding helps bridge the financial gap, encouraging private sector involvement. By leveraging VGF, the development of modern truck terminuses can be accelerated, enhancing logistics efficiency, reducing congestion, and minimizing the financial burden on the public sector.

4.4 Economic and Social Feasibility

4.4.1 Employment opportunities and economic impact:

1. Parking and operational infrastructure: Creates jobs in logistics, improving efficiency, reducing costs, and boosting trade and economic growth.
2. Administrative and commercial services: Generates roles in administration and security, formalizing businesses, increasing tax revenue, and enhancing Kolhapur's logistics hub status.
3. Driver amenities and living facilities: Jobs in hospitality and sanitation improve driver rest, safety, retention, and stimulate local businesses.
4. Supportive services and utilities: Creates jobs in vehicle maintenance, food, and fuel services, supporting MSMEs, reducing downtime, and boosting productivity.

4.4.2 Social impact:

1. Decongestion of inner-city roads: A truck terminus outside the city would divert heavy vehicles, reducing congestion, improving mobility, and enhancing road safety.
2. Improved safety for citizens: Reducing truck traffic in the city would lower accident risks, especially for pedestrians and two-wheelers, improving overall road safety.
3. Better living conditions for drivers: A dedicated terminus would provide essential amenities like clean toilets, rest areas, and medical aid, improving driver well-being and efficiency.
4. Cleaner urban environment: Relocating truck operations outside the city would reduce noise, air pollution, and littering, leading to a cleaner, healthier urban environment.
5. Promotes public order and discipline: A formalized truck terminus would address illegal parking and encroachments, improving urban order and ensuring smoother movement for all road users.

4.5 Operational Feasibility

1. Facility operations management: Efficient parking, vehicle flow, and scheduling are essential for smooth logistics, reducing congestion and delays.
2. Infrastructure and building maintenance: Regular upkeep of roads, buildings, and facilities ensures long-term durability, safety, and functionality.
3. Sanitation and housekeeping: Routine cleaning, waste disposal, and pest control are crucial for maintaining hygiene and a healthy environment.
4. Utility services management: Ongoing maintenance of water, power, and fuel systems ensures uninterrupted operations and safety.
5. Driver welfare and residential facilities management: Regular upkeep of dormitories, sanitation, and services ensures driver comfort and well-being.
6. Security and surveillance: 24/7 monitoring, proper entry/exit controls, and regular security checks ensure safety and order.
7. Health and emergency services: First aid facilities, stocked supplies, and fire safety systems support health and emergency preparedness.
8. Commercial vendor and lease management: Monitoring vendors for compliance, hygiene, and service quality ensures a functional and profitable commercial environment.

V. RESULT AND DISCUSSION

The Kolhapur Truck Terminus, developed under the Public-Private Partnership (PPP) model, is a highly feasible initiative with strong justification across various dimensions. The site, within the Kolhapur Municipal Corporation (KMC) limits and under the approved City Development Plan 2031, offers strategic connectivity on NH-48, linking key industrial hubs. Despite past waterlogging, engineering solutions like landfilling and drainage improvements will ensure suitability for development. Legally, the land is owned by KMC, free from encumbrances, facilitating smooth statutory clearance. KMC's success in PPP projects like the Kasaba Bawada and Dudhali STPs highlights its capability to manage complex infrastructure. Financially, the revised project

cost of ₹14.70 crores, adjusted for inflation, supports realistic budgeting, while multiple revenue streams (truck parking fees, office space rentals, food courts, fuel stations, and driver amenities) ensure financial sustainability. The Kolhapur District Lorry Operators Association (KDLOA) has committed financial and operational support, further backed by Viability Gap Funding (VGF), which subsidizes up to 40% of the capital cost. Economically, the terminus will improve logistics efficiency, reduce congestion, and position Kolhapur as a key logistics hub. It supports MSMEs, generates employment, and improves urban mobility and safety. Social benefits include enhanced living conditions for drivers, reduced traffic in urban areas, and a cleaner environment. Operationally, the project includes a comprehensive management framework for infrastructure, utilities, sanitation, security, and driver welfare, ensuring a functional and user-friendly terminus. Overall, this PPP-driven initiative will address logistical needs and contribute to Kolhapur's infrastructure growth.

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