

REQUEST FOR PROPOSAL (RfP)

Transition to Electric Freight Vehicles - Trends, Technology and Techno - Economic Analysis: India

C40 Cities Climate Leadership Group, Inc. 120 Park Avenue, 23rd Floor New York, NY 10017 United States of America

November 2023

1. C40 Cities Climate Leadership Group Inc. ("C40")

C40 is a network of nearly 100 mayors of the world's leading cities, who are working to deliver the urgent action needed right now to confront the climate crisis, and create a future where everyone, everywhere can thrive. Mayors of C40 cities are committed to using a science-based and people-focused approach to help the



world limit global heating to 1.5°C and build healthy, equitable and resilient communities. Through a Global Green New Deal, mayors are working alongside a broad coalition of representatives from labour, business, the youth climate movement and civil society to go further and faster than ever before.

The strategic direction of the organisation is determined by an elected Steering Committee of C40 mayors which is chaired by the Mayor of London, Sadiq Khan. Three term Mayor of New York City Michael R. Bloomberg serves as President of the C40 Board of Directors, which is responsible for operational oversight. A nine-person management team, led by Executive Director, Mark Watts, leads the day-to-day management of C40. C40's three core strategic funders are Bloomberg Philanthropies, the Children's Investment Fund Foundation (CIFF) and Realdania.

To learn more about the work of C40 and our cities, please visit our <u>Website</u>, or follow us on <u>Twitter, Instagram</u>, <u>Facebook</u> and <u>LinkedIn</u>.

2. Summary, Purpose and Background of the Project

2.1. Laneshift Programme

C40, in partnership with The Climate Pledge, has launched a Laneshift Programme, an exciting new freight decarbonisation technical assistance project from 2023 - 2025 to accelerate the deployment of zero emission freight vehicles and set the foundation for an electric freight (e-freight) highway between Indian cities by 2030. The programme aims to test and prove the feasibility of electric highways in India for e-freight movement.

By signaling demand and fostering collaboration across the transportation and logistics sectors, Laneshift will help create a roadmap for how the freight industry and cities can collaborate to expedite the transition to e-freight. Its goals are to address concerns about freight electrification, assess routes for electric freight deployment, engage stakeholders to bridge policy gaps, analyze the market for electrification supply and demand, and establish financial models to boost investment in electric freight vehicles in India.

2.2. Context of Study

The Government of India committed to achieving net-zero emissions by 2070 and reducing carbon emissions intensity by 45% by 2030, with a focus on decarbonizing the transport sector. The road transport sector including passenger and freight accounts for almost 92% of emissions. In India, medium and heavy-duty trucks constitute 2% of the total vehicles but account for over 45% of

the road transport sector emissions. Freight transport, primarily by road, is a major energy consumer and is projected to quadruple from 4 million to 17 million trucks by 2050. India's trucking sector is also projected to emit 800 million tonnes of CO_2 by 2050 with HDTs contributing nearly 50%.



With rapid urbanization, the demand for urban freight is expected

to increase by 140% in India and e-commerce growth will be a key driver for this increase. Urban freight accounts for ~10% of India's freight related CO₂ emissions. To address this challenge, the government introduced freight smart cities in 2021, aiming to enhance efficiency in logistics. However, decarbonizing heavy-duty and medium-duty freight vehicles is a complex endeavor, primarily due to factors like upfront costs, battery capacity, payload concerns and need for support infrastructure. Despite these hurdles, electrification stands out as a promising solution, given the right financial ecosystem and charging infrastructure. This transition holds the potential to significantly reduce emissions by 2050, while also offering cost savings and creating job opportunities, stimulating economic growth.

India is planning to upgrade 5,500 kms of existing highways and expressways into e-Highway in 12 states. Charging infrastructure is also being planned along these e-highways which can support e-freight vehicles. The lack of data on the supply and demand for EV freight, operational data and case studies further hinders understanding of e-freight demand. A comprehensive assessment is essential to evaluate technical feasibility, including production capacity, battery technology, and emissions reductions, to support zero-emission freight vehicles and highway electrification. The study aims to provide valuable insights and recommendations to the stakeholders, ultimately contributing to sustainable, efficient and environmentally friendly freight vehicle adoption in the road transport sector.

2.3. Objectives and Scope of Work

To expedite the transition to zero-emission freight vehicles, it's crucial to grasp current trends, technological advancements, and their economic viability for medium-duty (MDV) and heavy-duty (HDV) segments. While upfront costs pose a challenge, evaluating long-term savings and per-kilometer costs can highlight the competitiveness of zero-emission vehicles compared to traditional diesel counterparts. Additionally, exploring innovative business models and assessing infrastructure support in alignment with national, sub-national, and city-level policies and incentives is essential. C40 as part of the Laneshift - zero emission freight programme seeks a technical partner to study various zero-emission freight vehicle technologies in India, with a focus on their feasibility across different freight vehicle segments. This study aims to address barriers and concerns related freight electrification, taking into to account the techno-economic feasibility.

Through this study three major objectives has been identified for the technical support leading to move towards adoption of zero emission freight vehicles and under each of the objective there are list of actions identified which are as follows:

Objective 1 - To estimate the demand for e-freight vehicles based on the market trends.

Action Area 1 - Analyze market trends and historical data to grasp e-freight vehicle demand determinants.

Action Area 2 - Develop a demand forecasting model integrating market trends, economic factors and environmental aspects.

Action Area 3 - Assess the supply chain readiness and government policies affecting e-freight vehicle adoption.

Objective 2 - To capture the technological innovations in battery and charging infrastructure and associated risks.

Action Area 1 - Assess latest developments in battery technology and innovations in charging infrastructure

Action Area 2 - Identify potential risk associated with these innovations and review safety standards, interoperability, standardization and regulations.

Action Area 3 - Evaluate the environmental implications of identified new technologies.

Objective 3 - To develop a techno - economic analysis model for medium and heavy duty commercial vehicles and comparison of the costs and benefits over the lifetime of the vehicle.

Action Area 1 - Develop Techno-economic analysis model for e-freight vehicles and compare it to its conventional counterparts.

Action Area 2 - Conduct e-freight vehicle transition readiness assessment and current procurement/financial models considering various stakeholders

Action Area 3 - Assess the GHG emission reduction potential vehicle technology wise based on case studies and data to validate the model and enhance its accuracy.

2.4. Purpose of the RFP

The purpose of this Request for Proposal is to solicit proposals for consultancy services from firms/ consortiums (only, this assignment is not for individuals) to support the preparation of a model for transition towards electric freight vehicles by analyzing the trends, technologies and techno - economic assessment for India. The project is broken down into the following deliverables.

Deliverable A : E - Freight Vehicles Trends

This section entails stakeholder consultations with major e-freight vehicle manufacturers to understand their operational status, financial performance, and market positioning. It aims to highlight key challenges and opportunities in the e-freight industry, analyze market trends and share, and assess production capabilities for MDVs and HDVs. This package covers production trends, technology shifts, and market preferences while evaluating supply chain readiness and a brief overview of the partnerships enhancing production efficiency. Some of the key outputs will include stakeholder mapping and a

C40 CITIES comprehensive assessment at the sector level, driven by stakeholder consultations.

Deliverable B : E-freight Vehicles Technology and Support Infrastructure

This comprehensive section encompasses various interconnected activities aimed at delving into the multifaceted e- freight vehicle

ecosystem. It includes exploration of cutting edge e-freight vehicle technologies, tailored to the unique demands of the freight industry. The battery technology assessment and standardization activity aims to evaluate different battery technologies and performance, sustainability, and environmental impact; while also addressing safety standards. The battery cost drivers and forecasting phase targets an in-depth analysis of existing battery costs and related factors, cost-effective strategies, battery recycling and repurposing.

The charging infrastructure analysis and compatibility involves a thorough evaluation of the technical compatibility between charging stations and e- freight vehicles, ensuring suitability and interoperability. Gap identification, expansion strategies, and financial requirements employ geographical analysis to identify infrastructure gaps along the freight routes and recommend new locations, upgrades and standardization measures for charging stations.

Deliverable C : Policy Implementation Roadmap

This section will delve into analyzing current policies, incentives and infrastructure for zero emission freight vehicles to develop a roadmap with short, medium and long term intervention plans aligned with policy changes. It will also look into providing regulatory and incentive suggestions through stakeholder engagement and discussions to identify pilots for projects for the next phase.

Deliverable D : Techno-Economic Analysis of e-freight Vehicles

This section assesses e-freight vehicle electrification in India, identifies gaps in the existing assessment models and evaluates feasible e-freight vehicle categories. It also examines the current electrification status and stakeholder readiness. The Techno-Economic Model framework, guided by stakeholder inputs will analyze low-carbon technologies, infrastructure requirements, total cost of ownership (TCO) for zero emission freight vehicles, and environmental impact, including GHG emissions reduction potential. Model testing and validation phase will involve secondary data and stakeholder inputs to develop various scenarios with policies, incentives and key influencing factors.

This section captures the e-freight vehicle transition readiness from various stakeholders and conducts a comprehensive survey to collect data on the current operational and financial aspects for both MDVs and HDVs. Also to identify the challenges and training program requirements for a smooth e- freight transition. Collectively, these activities provide a holistic exploration of the e-freight vehicle landscape.

The Viable Business Model section identifies and tests innovative business models like Fleet Operations as a Service, Battery as a Service (BaaS) and Battery Swapping, comparing their financial viability with traditional models and exploring collaborative funding. The expected output is a comprehensive



knowledge platform with best practices, use cases, assessments, and business models supporting GHG emission profiling, reduction strategies and monitoring systems.

Besides the approaches defined above we would welcome suggestions from bidders around other methods to gain stakeholders' buy-in and support for the work.



3. Key Activities and Deliverables

3.1. E-freight Vehicles Trends

<u>Activities</u>

• Work Plan and Deliverables

 Prepare a detailed work plan clearly identifying key activities, deliverables and associated timelines, identify the data requirements and list of key stakeholders.

Stakeholder Mapping

- Conduct a stakeholder mapping to establish a list of key stakeholders in the freight ecosystem.
- Map key freight service providers based on the type of service (long haul, intercity, intra city, last mile deliveries etc.)

Production Capacity Assessment and Forecast

- Develop a detailed questionnaire and conduct stakeholder consultations to collect data and identify potential risks.
- Analyze data for market demand, projected market share and supply and demand landscape
- Evaluate industry requirements for e-freight vehicle production and assess technology advancements.
- Supply Chain Readiness
 - Compile key component list for e freight vehicles assessing its reliability and capacity. Also assess supply chain challenges, international dependence and associated risk.
 - Evaluate local component production scalability, domestic supplier capacity and explore collaboration for cost - effectiveness and technology transfer.
 - Assess government initiatives promoting domestic manufacturing for investment potential and formulate strategies addressing component shortage and supply chain disruption.
- Freight Vehicle Supply and Demand Projections
 - Project electric freight vehicle production capacity for 5, 10 and 15 years considering the planned expansion, market trends and demand.
 - Conduct a demand assessment of the e-freight medium and heavy duty vehicles considering the current adoption rates.

• Investigate government incentives influencing the capital costs and potential financial aid for market accessibility.

Outputs

Workplan

- Data analysis and insights from stakeholder consultations
 - Current production trends and production capacity current and future
 - e-freight vehicle specifications and cost components
 - Policy incentives and support from National/State/Local
 - Barriers or concerns for vehicle manufacturers
 - Supply chain readiness and risks for critical components
- Supply and demand side e-freight vehicle assessment

Indicative timelines

• Week 0 - Week 8

3.2. E-freight Vehicles Technology and Support Infrastructure

Activities

Battery Technology Assessment and Standardization

- Stakeholder consultations to collect data on the technological innovations, battery specifications, risks, battery management systems and cost components.
- Evaluate battery technology for performance, durability and suitability considering factors like energy density, range, charging speed, temperature tolerance and maintenance.
- Assess the environmental impact of battery technologies and highlight the best practices for battery disposal and safety standards.
- Review of the testing and certification frameworks for battery standardization
- Identify the potential collaborations with government agencies, vehicle and battery manufacturers to promote standardization.

• Battery Cost Drivers and Forecasting

- Analyze the current battery costs, identify cost drivers and estimate potential cost reductions.
- Assess the financial impact of battery longevity enhancement and charging / discharging optimisation.
- Investigate battery recycling and repurposing options and assess economic benefit and explore the feasibility of local battery manufacturing and potential cost savings.
- Research and identify government incentives and collaboration prospects for cost reduction.

• Charging Infrastructure Analysis and Compatibility

C40

CITIES

• Analyze technical specifications of charging infrastructure to collate data on capacity, types, and other specific particulars suitable for freight vehicle requirements.



- Analyze charging station usage, power capacity and speeds, classifying stations by type, key station operators, usability and challenges associated with it.
- Identify the compatibility limitations and assess the need for station modifications or upgrades.
- Gap Identification, Expansion Strategies and Financial Requirements
 - Develop strategies to expand e-freight support infrastructure rapidly, recommendations, upgrades, and standardization.
 - Estimate financial requirements for infrastructure expansion, including procurement, installation and maintenance.
 - Identify potential funding sources, such as government grants, private investments and partnerships

Outputs

- Comprehensive battery technology assessment summarizing regulations and standards, best practices for disposal and safety standards
- Detailed cost analysis and recommendations for cost reductions along with identification of collaboration prospects.
- Technical feasibility and cost assessment of charging infrastructure detailing the suitability and interoperability.
- Strategic plan for infrastructure expansion considering the expected growth and demand.

Indicative Timelines

• Week 9 - Week 16

3.3. Policy Roadmap

Activities

- Conduct an analysis of the existing policies, incentives, and support infrastructure plans for zero emission freight vehicles in India.
- Develop a national policy roadmap based on outcomes of Deliverable A including near term (2 years), medium term (5-10 years) and long-term (10-15 years) interventions (taking into ongoing policy developments in India).
- Provide recommendations on regulatory frameworks or incentives that could support the adoption of these new business models and funding approaches.
- The policy road map to be developed through a series of stakeholder consultations with all the concerned stakeholders in the freight ecosystem and C40.

Outputs

- Framework of the policy roadmap draft for review by C40
- Stakeholder Consultations to seek inputs and feedback on the draft policy roadmap.(government, private sector and other key stakeholders) - at least 4

regional consultations and a launch event (this does not include individual consultations)

Indicative timeline

Week 10 - Week 18



3.4. Techno-Economic Analysis of e-freight Vehicles

ation of th
ation of th
ify gaps
fication f
e readine
along wi
ework f
tion.
liness fro
viders, fle
ects of t
efreight f
c
from t
a compa
ow carbo
ICO of t
at vabia
it venici
ocoortoti
isportatio
tial due
lai uue
takabald
lakenola
na naliai
han fraia

vehicle incentives and accelerated rate of adoption due to supporting policy.

• Identify key influencing factors (battery cost, cost per kwh, operational kilometers etc.) and conduct sensitivity analysis to capture the change in cost per kilometer.



- Viable Business Models for Freight Electrification.
 - Identify and test different innovative business models such as Fleet Operations as a Service (FaaS), Battery as a Service (BaaS), Battery Swapping, different ownership models etc.
 - Compare the financial viability of these innovative models with traditional ownership models for different freight vehicle segments.
 - Investigate and recommend collaborative funding mechanisms, such as public-private partnerships or consortiums, to reduce financial risk.

• Zero-Emission Freight Knowledge Platform

- Develop a zero-emission freight knowledge platform, a one stop resource center for different freight ecosystem stakeholders.
- Database of best practices and techno-economic assessment model, use cases repository and business models.
- Platform to provide information on the GHG emission profiling, emission reduction strategies and setting up monitoring systems to understand the impact of zero emission freight vehicles.

• Outreach Activities

- Conduct thematic stakeholder meetings or roundtables to discuss the model results and incorporate revisions.
- Conduct webinars to share the techno-assessment model along with viable business models to various stakeholders.
- Conduct workshops for dissemination of the model results and launch zero emission freight platform with key stakeholders in the freight ecosystem.

Outputs

- Stakeholder consultations
- Report on e-freight vehicle transition readiness
- Techno-Economic assessment model
- Innovative business model and recommendations
- Model documentation report/manual
- Draft final report trends, technology and techno-economic model
- Final policy roadmap
- Zero Emission freight knowledge platform
- Events (webinars (2), workshop (1)

Indicative Timelines

• Week 10 to Week 38

The final outputs including data must be submitted to C40 in editable formats (PPTx, Word doc files).

C4O CITIES

4. Proposal Guidelines

4.1. Submission Details

This Request for Proposal represents the requirements for an open and competitive process. This Request for Proposal is specifically for firms/consortiums to apply and not individual consultants. Proposals will be accepted until **5 pm Indian Standard Time on 11 December 2023.** Any proposals received after this date and time will not be accepted. All proposals should include clear timetables, how you will work with C40, clear costs and detail on experience in this area.

The proposal should give C40 evaluators all the information they need to assess your bid. Please clearly indicate:

- Relevant information about the service provider and contact details; location of the registered office and location of the proposed team.
- How the proposal and services will meet the project objectives, in reference and alignment with the project scope and deliverables, and in line with <u>C40's Strategic Recommendations</u>.
- A timeline, indicating the different stages, milestones, proposed work plan to deliver the outline objectives and with adequate C40 review periods and stakeholder consultations should be included.
- An overview of expertise and experience on the topic of e-freight vehicles including references to previous work carried on Transition to e-freight vehicles in India is preferable. Please also highlight any global examples.
- The firm/consortium will require an onground team/office in India, with key staff leading the project to be based out of India and should have a technical team with the required expertise to execute the work.
- Details of the organization and proposed project team please include relevant experience and expertise and limit CVs to two pages per person; clearly indicate the project lead, the role of each team member and whether the person will be stationed in any of the working cities. The project team must ideally include:
 - 1. 1 Team Leader with 15 years of experience
 - 2. 1 Project Manager with 10-12 years of experience
 - 3. 3 Technical / Sector Experts with 7-8 years of experience.
 - 4. 2 Research Associates with 2-5 years of experience
- Work approach and coordination with C40, specifying required input and resources
- The proposed fee includes all professional fees, logistics, stakeholder consultation (survey/interview) costs, venue, publishing costs, design costs, translation costs, overheads and any misc costs involved. Clear cost break-down structure and explanation of expenses please see Section 7 "Project budget" for more details.

- Any risks and assumptions made in planning this work where risks are identified, appropriate alternatives and mitigation strategies should be outlined.
- The proposal should include contact details for at least two recent references.
- Confirmation of adherence to C40's terms and conditions.
- Any additional deliverables and/ or information relevant to this tender.

<u>Please note</u>: Proposals should be written in English, saved in pdf format and should not exceed 15 pages of text. Reference material may be placed in annexes. CVs should not exceed 2 pages.

Contract terms and conditions will be negotiated upon the selection of the winning bidder for this RfP. All contractual terms and conditions will be subject to review by C40's legal department and will include scope, budget, schedule and other necessary items pertaining to the project.

You must include adequate information about how your costs were calculated to enable evaluation of cost reasonableness. The costs must be provided in USD.

4.2. Supplier Diversity

C40 is committed to supplier diversity and inclusive procurement through promoting equity, diversity and inclusivity in our supplier base. We believe that by procuring a diverse range of suppliers, we get a wider range of experiences and thoughts from suppliers and thus are best able to deliver to the whole range of our diverse cities and the contexts that they operate within.

We strongly encourage suppliers (individuals and corporations) that are diverse in terms of size, age, nationality, gender identity, sexual orientation, majority owned and controlled by a minority group, physical or mental ability, ethnicity and perspective to put forward a proposal to work with us.

Feel welcome to refer to <u>C40's Equity</u>, <u>Diversity and Inclusion Statement</u> as supplier diversity and inclusive procurement is one element of applying equity, diversity and inclusion to help the world limit global heating to 1.5°C and build healthy, equitable and resilient communities.

4.3. Contract

Please note this is a contract for professional services and not a grant opportunity. Organizations unable to accept contracts for professional services should not submit bids. The work will be completed on the <u>C40 Standard Service Provider Agreement</u>.

These terms and conditions are non-negotiable. Organizations unable to accept them as drafted should not submit bids in connection with this opportunity.

If C40 are unable to execute a contract with the winner of this competitive process, we reserve the right to award the contract to the second highest Potential Supplier.

4.4. Subcontracting



If the organization submitting a proposal needs to subcontract any

work to meet the requirements of the proposal, this must be clearly stated. All costs included in proposals must be all-inclusive of any outsourced or contracted work. Any proposals which call for outsourcing or contracting work must include a name and description of the organizations being contracted in the proposal submission stage, any changes to this during the project will require prior approval from C40.

5. RFP and Project Timeline

RFP Timeline	Due Date
Request for Proposals published by C40	09 November 2023
Questions submitted to C40	17 November 2023
C40 responds to questions	30 November 2023
Deadline for Proposal submission	11 December 2023
Evaluation of Proposal	18 December 2023
All Potential Suppliers notified of outcome	21 December 2023

RFP Timelines

Project delivery timelines

Project Timeline	Due Date
The project initiation phase must be completed by	27 December 2023
Project planning phase must be completed by	10 January 2024
The project is due to run until	30 September 2024

The assignment will kick off in January 2024 and needs to be completed in 9 months. The bidders should suggest their initial proposal for the scope of work, timeline and key deliverables based on the Project Scope of Work described as following. This response will constitute the standard for what C40 can expect to find in the detailed project plan in terms of resources, breadth of scope and timeline.

6. Proposal Evaluation Criteria

Submissions will be evaluated against the following criteria:



Criteria	Weighting
Relevant expertise and understanding of topics outlined in the proposal; including references to previous projects, methods used, discussion of how this knowledge will be applied, and possibly expanded upon in this project	40%
Project delivery approach proposed, including project management approach (ability to deliver outputs on time and with quality)	30%
 Value for money Economy: Assessment of the cost efficiency & budget consciousness of the proposals - Consideration of whether the proposal costs aligns with the expected outcomes & deliverables Efficiency: Examination of proposed project management approach, resource allocation and timelines. Effectiveness: Assessment of appropriateness and viability of chosen methods and tools to achieve the objectives. 	20%
 Equity and ethical alignment considerations: C40 is looking to appoint an organization that shares our values and is grounded in the context of the local community. Consideration will focus on: Location of organization (preference will be given to locally based organization) Women and youth 	10%

7. Project Budget

The proposal should indicate a cost break-down structure, outlining the costs for each component of the analysis (based on the break-down of deliverables in **Section 3**). All costs included in the proposal must be all-inclusive, including any VAT, copyright or bank fees, transportation, venue charges, translation etc. Costs should be stated as one-time or recurring costs. C40 does not pay contractors more frequently than once per month.

A budget of **USD 100,000** is available including all taxes and other 'hidden' costs. Bids must not exceed this value.

All proposals must include proposed costs to complete the tasks described in the project scope, including all VAT and taxes. Costs should be stated as one-time or

non-recurring costs or monthly recurring costs. All costs incurred in connection with the submission of this RfP are non-refundable by C40.



8. C40 Policies

C40 expects third parties to able to abide by these C40 policies

- Non-Staff Code of Conduct Policy <u>here</u>
- Equity , Diversity and Inclusion Policy <u>here</u>

9. Submissions

Each Potential Supplier must submit 1 copy of their proposal to the email addresses below by **5:00 PM IST on 11 December 2023**:

- Anantha Paladugula, Head of Mobility, India, <u>apaladugula@c40.org</u>
- Santhosh Lognathan, Senior Manager Mobility, India, sloganaathan@c40.org
- Urvi Bhatt, Projects and Events Officer, India, ubhatt@c40.org

Any pre-bid queries need to be submitted to the above emails addresses by **5:00 PM IST on 17 November 2023.**

Anonymised responses to questions will be provided at this <u>link</u> on **30 November 2023**.

Disclaimer

C40 will not accept any liability or be responsible for any costs incurred by Potential Suppliers in preparing a response for this RFP.

Neither the issue of the RFP, nor any of the information presented in it, should be regarded as a commitment or representation on the part of C40 (or any of its partners) to enter into a contractual arrangement. Nothing in this RFP should be interpreted as a commitment by C40 to award a contract to a Potential Supplier as a result of this procurement, nor to accept the lowest price or any tender.