GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

CALL FOR

EXPRESSION OF INTEREST (EOI)

EOI No: ICF/SRP/EOI/2025

FOR

Car body, Bogie and Interior Design of Air Conditioned Rolling Stock for Suburban Rail Project

INTEGRAL COACH FACTORY
CHENNAI - 600 038.
Telefax:.044-26261872

Expression of Interest (EOI) for Design Services: Carbody, Bogie, and Interior Design for Rolling Stock

Issued by: Integral Coach Factory (ICF)

Date: March 14, 2025

EOI Number: ICF/SRP/EOI/2025

1. **Introduction**

Integral Coach Factory, Chennai (ICF) is a Coach Production Unit under Ministry of Railways, Government of India. Integral Coach Factory (ICF) invites Expressions of Interest (EOI) from experienced and reputable design agencies for the development of Carbody, Bogie, and Interior designs for rolling stock, specifically tailored to meet the requirements outlined in the K-RIDE Technical Specifications document. This rolling stock is intended for K-RIDE.

1.1 OBJECTIVES of ICF:

1. ICF is planning for Manufacture Rolling stock for Broad Gauge Suburban Rail Project.
2. This Document contains broad guidelines and expected outcome of the proposed work.
3. To identify Potential Bidders for issuing RFP (Request for Proposal) by ICF for development of "**Carbody, Bogie, and Interior Design for Rolling Stock**".
4. To finalize Terms of Reference and other modalities for RFP.
5. Based on the outcome of this EOI, ICF plans to carryout procurement process in a transparent manner through competitive bidding.

1.2. Benefit to the respondents

1. The prospective bidders can understand the requirements properly which can help during participation in RFP
2. Will provide opportunity to take part in detailing of the scope of work.

1.3. Interested Firms/Organizations are requested to contact on the following emails for obtaining further details and technical Specifications of KRIDE.
If the respondent is having technical expertise in any one of the Interior design, carbody design and Bogie design then the respondent can show interest for any one of the above also.

Email: cdemicf@gmail.com,
dycdeicf@gmail.com,

smedesignicf@gmail.com

1.4 Interested Firms/Organizations who have experience and capability to meet with such requirements are requested to submit technical and other details on or before 31-03-2025 to the address mentioned below. Details submitted after 31-03-2025 will not be considered as part of response of this EOI. Respondents can send their response by Email or Hard copy by Mail or else can submit physically at the below mentioned address. In case 31st March 2025 falls on a Holiday, the response can be submitted on the next working day.

Address : Chief Design Engineer/Mech.
Design & Development Centre
Integral Coach Factory Chennai - 600 038
Telefax:044-26261872 / Railway : 46800

Email: cdemicf@gmail.com,
dycdeicf@gmail.com,
smedesignicf@gmail.com

Time for submission – By Email upto 23:59 hrs of 31-03-2025; By Post or Physical handing over: Upto 17 30 Hrs of 31-03-2025

2. Instructions to the Respondents

2.1. This current document is an Expression of Interest (EOI) published by the Indian Railways (ICF) to solicit and examine the response of the firms/companies/entities that are supplying or capable of executing the supplies, Works and Services as per the details mentioned in this document before Indian Railways finalize the specification of the Supplies, work, equipment and services and associated conditions before Invitation of bids. The current document is therefore to explore the response from the prospective Respondents.

2.2. The timelines and the quantity of units mentioned in this document are subject to change and shall be firmed up while the Technical and Commercial Bids are called for by ICF/ Indian Railways at a later date.

2.3. Final specifications and conditions of contract shall be made after going through the response and comments of the respondents, in response to this document. Invitation for Bids shall be called for after the specifications are finalized by ICF, Ministry of Railways, Government of India

2.4. Some of the operational conditions of contract are briefly mentioned in this document for guidance of the respondents. These are subject to change based on the examination of response received and in

line with the Indian Railways Standard conditions of Contract.

2.5. However, it may please be noted that the decision of India Railways shall be final while addressing the issues raised by respondents in response to this document.

2.6. Indian Railways may change any or all of the terms and conditions and/or technical, commercial or operating requirements in their final document from the ones, which are specified in the current Expression of Interest. The revised set of conditions and specifications that shall then be part of final Invitation for Bid document which will be published at the time of calling for Bids.

2.7. Firms are free to respond for this project as a single entity or as a consortium of Companies one of which must own the offered technology without any encumbrances. In case of consortium, the primary responsibility of executing the project shall be of the majority stakeholder.

2.8. ICF invites response to this EOI and preliminary proposals from such firms/entities specifying basic technical details as per but not limited to the points mentioned in this EOI documents.

3. Project Scope

The selected design agency will be responsible for the complete design and engineering of the following:

- **Carbody:** Design, structural analysis (including FEA), and optimization of the carbody structure, considering factors such as passenger capacity, safety, weight optimization, aerodynamics, and aesthetics. The carbody design must comply with K-RIDE specifications for:
    - **Material:** Austenitic Stainless steel (including underframe). Alternatively Underframe can be of Corten Steel.
    - **Dimensions:** Length: 21.74m (including end fairings) & 21.6 m (Over buffers) , Width: 3.2 m, Height: 3.85m
    - **Crashworthiness:** Compliance with EN 15227
    - **Fire safety:** Compliance with DIN 5510, BS 6853, and NFPA 130
    - **Car Body strength -** Carbody shall meet the requirements of EN 12663, category P3/ UIC 566
    - **Weight compliance:** Carbody weight should be in line with the overall weight of the coach and Electrics

- **Bogie:** Design, development, and analysis (including MBD simulations and Kinematic gauging simulations) of the bogie system, ensuring ride comfort, stability, safety, and compatibility with the track gauge and other interface requirements. The bogie design must meet K-RIDE specifications for:
    - **Track gauge:** 1636 mm (Broad Gauge)
    - **Maximum speed:** safe speed 95 KMPH and operational speed 85 Kmph
    - **Axle load:** 17 tonnes
    - **Suspension system:** Air suspension with secondary suspension

- MBD simulations of Bogie for both new and worn out wheels as per EN 14363 for ride characteristics, Derailment characteristics, Critical speed (hunting) analysis, sway characteristics, Yaw resistance curve, roll, pitch and bounce frequency analysis, vertical wheel load forces analysis.
- Kinematic gauging simulations as per EN 15273 and UIC 505 for both new and worn out wheels as per attached Technical specification of KRIDE.
- The bogies shall be of the two axles bolster less type incorporating a proven primary suspension system such as metal bonded rubber springs or proven helical coil steel springs
- The bogie shall pass the X factor test (Rotational resistance test) at AW0

- **Interiors:**
- The interior design of the coach including the design of -
    - Interior Paneling of side wall, roof and endwall
    - Partitions coming inside the coach
    - Interfacing with electrical fittings and mechanical items
    - Luggage rack design
    - Design of Seating
    - Diffuser Grills
    - Air Conditioning Ducting
- Design of passenger and driver compartments, including seating arrangements, lighting, ventilation, information systems, accessibility features, and aesthetics, in compliance with relevant standards and passenger comfort guidelines.
- Human factors and ergonomics (HF&E) duly considering comfort design, functional design, and systems, should be part of the interior designing to take proper account of the interaction between amenities and the passengers
- Sitting surface may be metal / non-metal. In case of metal surface, seat shall be made of anti-slip bucket type stainless steel.
- With regard to fittings and attaching hardware (nuts, bolts, washers, brackets and special fixing arrangements) only non-corroding materials are acceptable. The use of self-tapping screws shall not be acceptable.
- All interior surfaces must be finished with good blending and good slow ageing properties to provide a pleasant, high-quality interior and for ease of cleaning and maintenance
- The interior design should consider K-RIDE requirements for:

    - **Passenger capacity (Approx):**

Car	Seating	Standing		Total (Seating + Standing)	
		Fully Loaded/ Dense Crush loaded (AW4)	Crush Loading (AW3)	Fully Loaded/Dense Crush loaded (AW4)	Crush Loading (AW3)
DM Car	66(Approx)	270	200	336	266
T/M Car	72 (each T car)	308	230	380	302
DM Car	66(Approx)	270	200	336	266
Total (for 6car train)	204	848	630	1052	834

- **Accessibility:** Provision for wheelchair spaces, handrails, and priority seating as per guidelines.
- **HVAC system:** The Heating, Ventilation and Air-conditioning (HVAC) System shall be installed on each car to provide full control of interior temperatures automatically, over the full range of heat loads associated with passengers, miscellaneous electrical equipment, lighting, heat transmission and solar gain.
- **CFD analysis of HVAC system considering all the heat loads, passenger capacity and RMPU design.**
  HVAC unit shall be designed to achieve internal condition as follows:

Weather Conditions	External Conditions	Internal Conditions
Summer	35.2°C Dry Bulb, 19.6°C Wet bulb	25°C Dry Bulb, 60% RH
Monsoon	27.3°C Dry Bulb, 23.0°C Wet bulb	25°C Dry Bulb, 60% RH

- **Lighting:**The lighting system shall generally conform to EN13272. . All LED modules shall comply to IEC 62717, IEC 62031, EN 50155, IEC 61373.

- The colour of the LEDs shall be warm white (temperature 4000K-5000K) and CRI shall not be less than 80

- Luminaire efficiency inclusive of LEDs/control gears & optics etc. shall not be it may be desirable to adjust the lux level to 250/200 in the saloon.

- Provision shall be made for adjustment of the lux level within saloon. At least three levels of adjustments i.e. 200 lux / 250 lux / 300 lux shall be provided in the saloon illumination less than 100 lm/W at the working junction temperature

- **Fire safety:** Materials used in the construction of each train shall be selected to reduce to the maximum extent practical, the heat load, rate of heat release, propensity to ignite, rate of flame spread, smoke emission and toxicity of combustion gases.

  The vehicle floor shall provide a fire barrier of thirty minutes duration tested in accordance with EN 45545: 2013 Part 1 to 7(Category 4- A, Hazard level HL3) or equivalent standard.

  Fire load shall not exceed 28000 MJ above and below floor level each.

4. Required Expertise and Experience

Interested design agencies must demonstrate the following:

- Proven experience in the design and engineering of rolling stock (metro cars, regional trains, or similar). Specific experience with stainless steel carbody construction is required.

- Firms shall submit details of Design activities carried out in various Rolling stock projects in the format enclosed at Annexure –A.
- Strong capabilities in:
  - Finite Element Analysis (FEA) for structural analysis and optimization.
  - Multi-Body Dynamics (MBD) simulations for bogie and vehicle dynamics.
  - Computational Fluid Dynamics (CFD) for aerodynamic analysis (if required).
  - 3D modeling and design using industry-standard software.
  - Comprehensive understanding of relevant railway standards and regulations (e.g., UIC, EN, etc.).
  - Ability to deliver complete and detailed design documentation, including drawings, specifications, analysis reports, and manufacturing instructions.
  - Experience in designing for manufacturability and maintainability.
  - A strong team of qualified engineers and designers with expertise in the relevant disciplines.

5. Deliverables

- Detailed design and Manufacturing drawings of Carbody, Interiors and Bogies.
- The design shall be interfaced with Propulsion system, Doors, Brake system etc.
- Manufacturing drawings and process flow charts.
- Any new Machinery and Plant to be suggested for better fit and finish of the rolling stock.
- Design of Jigs and Fixtures along with all manufacturing drawings.
- The design developed shall meet the requirements of Technical Specifications.

- The weight of the Designed rolling stock shall be within the limits specified in the specification.
- Design validation reports as per the requirements of the Specifications.
- Probable suppliers (duly meeting the requirement of make in India)

6. Expected timelines for execution : 4 months

7. Inputs from ICF

- ICF will be engaging a team of its own Design engineers to co-develop and expedite the project.
- ICF will share existing designs of Bogies, Carbody for evaluation as guidance to the successful bidder for reference.
- ICF will be arranging the inputs of other bought out items like Propulsion, Doors, Brake system, Gangways etc.

8. EOI Submission Requirements

Interested agencies are requested to submit the following information:

- Company profile, including experience in rolling stock design, organizational structure, and key personnel.
- Detailed description of relevant projects undertaken, highlighting their contributions and achievements.
- Technical capabilities and resources, including software, hardware, and testing facilities.
- Approach to design and project management, including quality assurance processes.
- Proposed team structure and expertise.
- References from previous clients.
- Estimated budgetary cost.
- Suggestions or modifications for the scope of work.

9. Evaluation Criteria

EOIs will be evaluated based on the following criteria:

- Relevance and extent of experience in rolling stock design.
- Technical expertise and capabilities.
- Quality of past project performance.
- Proposed approach to design and project management.
- Financial stability and resources.

10. Meetings with ICF

- ICF can discuss with the respondents regarding technical and commercial aspects of the planned consultancy.

- Either physical meeting or Video Conference can be organized with respondents. Date and Time can be fixed in consultation with ICF. For Date and Time Please contact smedesignicf@gmail.com
- ICF will be participating in discussion with such respondents having sufficient credentials as brought out above.

11. RFP

Detailed RFP will be floated by ICF detailing all requirements based on the outcome of EOI.

Payment structure and all the tender conditions will be part of the Tender document (RFP) which will be floated by ICF based on the inputs received in the tender.

Public Procurement (Preference to Make in India), Order 2017 norms will be applicable for the RFP.

12. Submission Deadline

The deadline for submission of EOIs is 31st March,2025.

This EOI is not a commitment to award a contract.

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Annexure-A

Rolling Stock Project	Car Builder (Manufacturer)	Operating Speed	Design Scope carried out (Like Carbody Design, Interiors, Bogie etc.)*	Customer	Year of Execution	Status (Completed / In progress/ Expected)

*Details to be submitted separately
Performance certificates from Car Builders/Customers to be submitted.