INDIAN INSTITUTE OF SCIENCE
BANGALORE

Notice Inviting Tender (NIT)

from domestic bidders

under Two-Cover Bid System

for

Supply and Installation of Heavy Vehicle Simulator Equipment and Software at the Center for infrastructure, Sustainable Transportation & Urban Planning (CiSTUP), IISc Bangalore

Tender No.: IISC/Purchase/CiSTUP/2022-23/01
Date: April 12, 2022

Chair, Purchase committee to Procure Driving Simulator for Heavy Vehicles,
Center for infrastructure, Sustainable Transportation & Urban Planning (CiSTUP),
Indian Institute of Science (IISc) Bangalore,
SID Complex. Bengaluru - 560012,
Karnataka, India

GSTIN: 29AAATI1501J2ZV

IISc website for tender announcements
https://iisc.ac.in/business-with-iisc/tenders/

Email ID for this tender

pcpdshv.cistup@iisc.ac.in

Notice Inviting Tender from domestic bidders for supply and installation of Heavy Vehicle Simulator equipment at the Center for infrastructure, Sustainable Transportation & Urban Planning (CiSTUP)

The Centre for infrastructure, Sustainable Transportation and Urban Planning (CiSTUP, referred henceforth as the Purchaser in this document), Indian Institute of Science (IISc), is inviting bids in two- cover format for the supply and installation of Heavy Vehicle Simulator (HVS) as per the bill of quantity (BoQ) in Annexure-II. The equipment is meant for experimental research to enhance the current understanding of heavy vehicle driver behaviors in Indian traffic conditions.

1. SCOPE OF WORK

The bid is expected to be on a turn-key basis, meeting all the stipulated requirements involving supply, installation, commissioning, the configuration of the management software, documentation, and training/handover to CiSTUP staff. Annexure-I details the technical requirements of the Heavy Vehicle Simulator. The bid is also expected to include two years of OEM support.

The Test-bed will be housed in a specified building at IISc. The bidder has to ensure that the resources (personnel) allocated for each one of the above tasks are competent and capable of meeting all the technical requirements in order to ensure that the broad objective of delivery of services as per expectations is fully met.

2. BIDDER'S ELIGIBILITY CRITERIA

1) Quotations should come only from Indian Original Equipment Manufacturer (OEM) or their authorized Indian distributor.
2) The quotations should be on FOR-IISc Bangalore basis in INR only.
3) The bidder should belong to either class-I or class-II local supplier category distinguished by their "local content" as defined in the Govt. of India's policy. They should mention clearly which class your company belongs to in the cover letter.
4) The bidder needs to submit a Manufacturer's Authorisation Form (MAF) by the OEM stating that the bidder is authorised to supply the equipment.
5) Original Invoice, Original Warranty Certificate, Original Test Reports should be produced for all imported items from OEM (Original Equipment Manufacturer) at the time of supply of the equipment
6) Bidder shall have to submit audited accounts (Balance sheet profit and loss account) of last three financial years. Audited statement must be signed and stamped by qualified chartered accounted.
7) Bidder must submit up to date sale tax and GST clearance certificate.
8) The bidder should have a track record of having previously supplied similar equipment to Central/State Government or other reputed firms. Purchase order copy of at least one previous installation is required along with customer contact details.
9) In the technical bid, the bidder should clearly demarcate the responsibilities between the OEM and the bidder. Complete details of the same have to be submitted in the technical bid. However, for complete supply, installation, and post-installation service, the bidder shall be responsible.

10) The technically qualified bidders should be in a position to demonstrate their equipment and software capabilities through technical presentation and video.

11) The bidder has to provide an undertaking on the official letter-head of the company that it has not been blacklisted by any department or undertaking of the Central or State Government department/Public Sector Undertakings (PSU)/Public Sector Enterprises (PSE)/ Banks in India.

3. SUBMISSION OF BIDS

1) Bids should be submitted in two-cover sealed hard-copy format – i.e., in two sealed envelopes clearly marked as "Technical bid" and "Commercial bid", enclosed within a common outer envelope mentioning
"Tender for Heavy Vehicle Driving Simulator; Tender No.: IISC/Purchase/CiSTUP/2022-23/01".

The sealed envelope should be delivered to the following address on or before due date:

Chair, Purchase Committee to Procure Driving Simulator for Heavy Vehicles,
Center for infrastructure, Sustainable Transportation & Urban Planning (CiSTUP),
Indian Institute of Science (IISc) Bangalore,
SID Complex. Bengaluru - 560012,
Karnataka, India

Bid documents and all enclosures must contain the name and address of the bidder, as well as the signature and seal of the authorized representative of the bidder.

2) Late or delayed bids shall be summarily rejected.

3.1 TECHNICAL BID

The technical bid should contain the following.

1) Overall compliance statement indicating adherence to each and every clause in the terms and conditions, as per annexure-III.

2) The technical bid must clearly specify the prescribed technical specifications without including the prices (Annexure-I details the required technical specifications of the heavy vehicle simulator in two parts). Please provide in detail the specifications for each part under each subhead and bullet point. Unique characteristics may be highlighted.

3) Manufacturer's Authorisation Form (MAF) from the OEM, and authorizing the bidder to bid against this tender.

4) Terms for licensing (perpetual or linked with support contract) and service/support for each hardware/software component. Terms for software usage and update should be unambiguously stated.

5) A copy of the masked commercial bid in the BoQ format.

6) The bid has to quote for the entire solution as per BoQ, partial offers will not be accepted. The bidder is required to indicate, by filling-in Annexure-IV, whether each line item in the BoQ is quoted.

7) Permanent Account Number (PAN, issued by Income Tax authorities) and GST Identification Number (GSTIN), along-with proof.

8) Bank/RTGS detail on the letter-head of the bidder. A copy of the cancelled cheque should also be attached.

3.2 COMMERCIAL BID

1) The commercial bid should contain the unit rate (in Indian Rupees) and the quantity for each one of the line items as well as the total bid price (in Indian Rupees).

2) Price must be quoted against each line item in the prescribed BoQ format as per Annexure-V.

3) Price should include all discounts applicable to research institutions given that the equipment will be used for research purposes.

4) The commercial bid should contain, among other things, payment terms, warranty, installation, and commissioning charges. These charges will be paid only after successful supply, installation and acceptance.

5) Bid should be valid for 60 days from the date of submission.

4. INSTALLATION, TRAINING AND DOCUMENTATION, SUPPORT CONTRACT

4.1 INSTALLATION

The total solution supply, installation, and commissioning, as per the PO (purchase order), should be completed within 8 weeks after receiving firm PO from IISc.

4.2 TRAINING AND DOCUMENTATION

1) Appropriate number of training sessions for CiSTUP technical staff for effective operation and management of the HVS, and including the configuration/usage of the HVS software.

2) Documentation (manuals, SOPs, etc.) for all hardware, software, and services offered (in digital format) shall be provided to the Purchaser.

3) A technical report on the HVS and hardware/software configuration will be a prerequisite condition for granting acceptance from the Purchaser.

4.3 WARRANTY AND OEM SUPPORT CONTRACT

1) OEM support contract should be for a period of three years from the date of acceptance of the equipment for both hardware and software.

2) While the support contract is in effect, the bidder/OEM shall attend to all the hardware and/or software problems on site and shall replace the defective parts at no extra cost to the purchaser within 5 working days after reporting the issue.

3) Performance security guarantee through any nationalized bank in India for 3% of the total purchase order amount shall be given by the selected bidder to the Purchaser. Format of the performance security guarantee will be given by the purchaser at the time of issuing the purchase order.

4) OEM/bidder shall clearly specify the conditions over which the service obligations will be void. Detailed document regarding warranty conditions and applicability should be submitted along with bid with a declaration of accepting the warranty conditions of the purchaser stated at above clause 4.3.

5. ADDITIONAL GUIDELINES

1) Regarding any clarification on technical/commercial aspects or any other issue, queries may only be submitted to the email ID pcpdshv.cistup@iisc.ac.in the deadline (as per the schedule in section 7) for pre-bid queries. No queries will be entertained after this deadline.

2) Changes in the tender, if any, made after pre-bid meeting, will be published on the IISc website as corrigendum. Any kind of corrigendum/ addendum will become an integral part of this tender document.

3) IISc is eligible for 5% GST under concessional certificate for which GST exemption certificate will be provided against proforma invoice. Any other statutory levies (if applicable) and GST should be shown separately and not included in the total amount.

4) Delayed and/or incomplete bids are liable to be rejected.

5) The technical bid should not contain any price information.

6) All pages of the technical bid should be duly signed by the bidder.

7) The bidder must submit all the original documents submitted for technical bid in a hard copy, properly spiral bound in one volume only.

8) The bidders are requested to go through the terms and conditions detailed in this document. Agreeing to the terms and conditions of the tender document (by signing all pages of the copy of the document) is a mandatory requirement.

9) Award criteria: the two-cover system will be followed.

    a. Technical bids will be opened first. IISc may seek clarifications after opening of technical bids and may ask vendors to demonstrate the promised technical specifications. Vendors may be required to give presentations. After technical evaluation by a committee, vendors may be asked to re-quote in a specific format to facilitate comparison of prices.

    b. Commercial bids of only the technically qualified bids will be taken up for further processing. Decision of IISc will be final and binding.

    c. IISc will place the purchase order on the bidder whose technical bid has been determined by the Purchaser to meet technical evaluation criteria and who has offered the lowest evaluated **total** bid price (see Annexure V).

10) IISc reserves the right to accept or reject any bid, and to cancel the bidding process and reject all bids, at any time prior to the award of contract, without thereby incurring any liability to the affected bidder(s) or any obligation to inform the affected bidder(s) of the grounds for the IISc's action.

11) The Director, IISc Bangalore reserves the right to modify the technical specifications or the required quantity at any time.

12) Courts of Bengaluru shall have exclusive jurisdiction over matters covered in this tender.

13) The bid must be addressed to "Chair, Purchase Committee to Procure Driving Simulator for Heavy Vehicles"

14) Contact: any queries or requests for clarification must be directed (through email only) to pcpdshv.cistup@iisc.ac.in

6. PAYMENT TERMS

100% payment as per PO will be released after complete supply, installation, and commissioning of the items followed by submission of invoice and performance security guarantee as per clause 4.3(3).

7. IMPORTANT DATES

Release of the tender document on IISc website	April 12, 2022
Submission of queries (for pre-bid clarification) by email to pcpdshv.cistup@iisc.ac.in	April 19, 2022, 5.00 pm IST
Pre-bid clarification meeting online over MS Teams (exact date/time and meeting invite to be intimated by email to potential bidders submitting pre-bid queries)	April 26, 2022, 5.00 pm IST
Release of corrigendum (if needed)	April 29, 2022, 5.00 pm IST
Deadline for submission of bids	May 2, 2022, 5.00 pm IST
Opening of technical bids	May 9, 2022, 5.00 pm IST
Technical presentations	To be declared later
Opening of price bids (price bids of only those bidders, whose technical bid is shortlisted, will be opened)	Exact date and time will be communicated to technically qualified bidders by email.

ANNEXURE-I: TECHNICAL SPECIFICATIONS OF THE HEAVY VEHICLE SIMULATOR

Definitions of the terms used:

Subject vehicle: The vehicle driven by the participant/trainee/driver. This vehicle will be represented in the driving scene as a heavy vehicle, and its dynamics/behavior is controlled by the participant/trainee/driver using the hardware.

Abstract traffic (abstract vehicles and abstract pedestrians): The traffic present in the driving scene includes vehicles (motorized and non-motorized) and pedestrians controlled via computer program/code. These are also called animated objects, AI objects, simulated traffic, etc.

User-defined signals: These signals are created by the user via mathematical operations on the default signals (already available signals).

For example, UserDefinedSignal1 = (DefaultSignal1 + DefaulSignal2)/(DefaultSignal3)

The table below provides the detailed technical specifications:

NOTE: We have divided the technical specification into two parts. Part I: refers to the technical specification for the driving simulator's basic features and Part II: refers to the driving simulator's additional features.

PART I: Basic Features

Hardware	
Driving station	Heavy vehicle platform with activated and realistic typical controls including but not limited to the steering wheel (motorized), gear shifting lever, accelerator, brake, and clutch pedals, hand brake, adjustable seat, seat belt, indicator controls, side and rear-view mirrors capable of displaying the simulated traffic. In addition, it shall be equipped with a synchronized audio feedback system. High-fidelity force feedback brake system that can emulate realistic force cues depending on steering angle and vehicle speed shall be placed.
Control station	A control station/instructor station/software program to start, stop, run the simulation/simulation scenario, and save data files, and record driving sessions. **Desirable**: Desktop-based control station with the configuration fully compatible with simulator hardware and software requirements and equipped with the latest versions of all softwares required.
Motion platform	Static platform with flexibility for upgrading to 3 degrees of freedom (majority of the hardware components from the static platform and driving station shall seamlessly be integrated/used when upgrading to 3 degrees of freedom). The integrated driving station and motion platform shall provide a realistic driving feeling.
Emergency features	The simulator shall be equipped with emergency safety features, including but not limited to emergency stop buttons at driving and control stations to stop the driving session immediately.
Display with all the required ports and cable connections	Single screen LED display (screen size at least 45 inches) Important: The Bus driver's point of view shall be realistic. Because of the size of the bus, the bus driver's line of sight is at a greater height as compared to car drivers. Therefore, the combination of hardware and display shall provide similar experience i.e., driving a large size vehicle.
Software	
Driving scene developing tool/package	An easy-to-use graphical user interface that allows developing realistic Indian traffic scenarios in the simulator. Scenario control should include ambient traffic simulation, scriptable events, relational behaviors, and environmental controls. More specifically, the following objects shall be available in default libraries: a) Different types of roads: expressways, state and national highways, rural roads

	b) Road geometry: number of lanes, road-width, lane width, horizontal and vertical curves, road gradient, provision for including and excluding road medians, shoulders (paved and unpaved) c) Road terrain: plain and mountainous/hilly d) Unsignalized and signalized intersections with specific features e) Road objects such as speed breakers, traffic cones, barriers, roads under construction, street lights, traffic signboards, direction boards, pedestrian crossing and traffic signals, road tunnels, bridges, etc. f) Road markings with a provision for NOT demarcating the lanes g) Traffic signals with a controller to control the cycle length and its elements (red time, amber time, green time) h) Buildings such as commercial and residential, and vegetation including trees, grass, farmland, etc. i) Toll-plaza and its elements such as number of counters and number of lanes j) Different vehicle types (motorized and non-motorized) are available in the Indian market, including cars, vans, motorcycles, buses, mini-buses, trucks, tractors, tractor-trailer combinations, auto-rickshaws, non-motorized three-wheelers, bicycles, etc. k) Pedestrians: children, adults (young and old) l) Provisions to set the speed limit m) Provisions to control traffic density and composition/mix n) Provision to import images and objects Note: the tool/package shall be capable of developing objects (vehicles, pedestrian crossing, road sections, buildings, etc.) with user-defined features for new objects OR if some of the above objects are not available in the libraries or to develop new objects

Vehicle dynamics	a) The dynamics (features) of all abstract traffic (vehicles and pedestrians) shall be user-controlled b) Provisions to control/set the complete route c) Abstract vehicles (motorized and non-motorized) features: top speed, acceleration/deceleration characteristics, lateral and longitudinal maneuvers, other typical vehicle parameters, non-lane based maneuver (e.g., vehicle cut-in), overtaking behavior, right turn, left turn, gap (time-based and distance-based) to the lead and side vehicles, offset to the road and lane edges, set lane d) Abstract pedestrians: set-top speed, acceleration/deceleration characteristics, lateral and longitudinal maneuvers e) Abstract vehicles and pedestrians shall by default follow traffic rules such as stopping at the stop line, maintaining the speed limit, obeying the traffic signs and signals. f) Provisions to set triggers (time-based/position based/subject vehicle position based/other) for controlling abstract traffic at a microscopic level. Trigger examples: the abstract car changes lane as soon as the subject vehicle is 10 m behind the abstract car, or an abstract pedestrian starts crossing the road as soon as the subject vehicle is 20 m away from the pedestrian crossing **g) Desirable for abstract vehicles:** 1) Flexibility to amend/override the predefined set of rules for abstract vehicle dynamics 2) Flexibility to replace the predefined set of rules for abstract vehicle dynamics with other vehicle dynamics models
Data collection	
Subject vehicle	The following signals shall be recorded with a frequency of at least 10 Hz (i.e., 10 data points in 1 second). The desirable frequency is 100 Hz. a) Timestamp b) Position (X, Y, and Z) c) Speed (X, Y, and Z) d) Bearing angle

	e) Steering angle f) Brake pedal pressure/other measuring units to measure brake pedal press g) Accelerator pedal pressure/other measuring units to measure brake pedal press h) Clutch pedal pressure/other measuring units to measure brake pedal press i) Lane number Other signals as and when the event happens: j) Gear shift k) Seat belt l) Indicator on/off m) Traffic rule violations n) Collision information Provisions to create and record user-defined signals. Note: Timestamp of all signals shall be in sync **Desirable:** a) Offsets from road and lane edges
Abstract vehicles	The following signals shall be recorded with a frequency of at least 10 Hz (i.e., 10 data points in 1 second). The desirable frequency is 100 Hz. a) Timestamp b) Position (X, Y, and Z) c) Speed (X, Y, and Z) d) Bearing angle e) Vehicle type f) Vehicle dimension (length, width, height) g) Offsets from road and lane edges Other signals as and when the event happens: h) Indicator on/off i) Traffic rule violations j) Collision information Provisions to create and record user-defined signals. Note: Timestamp of all signals shall be in sync **Desirable:** a) Offsets from road and lane edges
Abstract pedestrians	The following signals shall be recorded with a frequency of at least 10 Hz (i.e., 10 data points in 1 second). The desirable frequency is 100 Hz. a) Timestamp b) Position (X, Y, and Z) c) Speed (X, Y, and Z) d) Bearing angle e) Pedestrian type Other signals as and when the event happens: f) Traffic rule violations g) Collision information Provisions to create and record user-defined signals. Note: Timestamp of all signals shall be in sync
Other requirements	a) Software shall support exporting data files in at least one of the following formats: CSV and XLS/XLSX and downloading the recorded driving sessions in standard video formats e.g., MV4, WMV, MOV

	b) Software shall be compatible with the latest version of MS Windows operating system c) Scene transition shall be smooth with minimum lag d) Simulator shall be compatible for any future connections with other simulators where the drivers can drive and interact with one another in a connected environment e) **Important:** limitations in terms of the maximum number of abstract vehicles and pedestrians can be accommodated in one scenario, the maximum length of roads, the maximum number of legs in an intersection, maximum time duration a scenario can run without lags, and other software limitations shall be stated unambiguously. **Desirable:** Flexibility to import traffic from other simulation software packages such as AIMSUN, VISSIM, etc.

PART II: Additional Features

Hardware	
Motion platform	Three degrees of freedom. The integrated driving station and motion platform shall provide a realistic driving feeling.
Display with all the required ports and cable connections	180 degrees field of view with a curved screen including all required projectors providing a seamless display
Software	
Specific software requirements (Driving scene)	Provisions shall be there to collect local coordinates of roads, road edges, buildings, vehicles, and other objects from the origin. Such information will be useful to calculate other variables such as the offset of vehicles from the road edges (using coordinates of road edges and vehicles).

ANNEXURE-II: BILL OF QUANTITIES (BOQ)

The bidders are required to submit their bids as per the following BoQ:

Heavy Vehicle Simulator Part	Description	Quantity
Part-I		
Driving station with static motion platform with all the required ports and cable connections	Refer to Annexure-I (**Part-I**)	1
Display with all the required ports and cable connections	Refer to Annexure-I (**Part-I**)	1
Software package with the capability to record data	Refer to Annexure-I (**Part-I**)	1
Other components (hardware parts, power cables, connection cables, adapters, etc.) are required for the smooth functioning of the simulator		As required
Part-II		
Motion platform with three degrees of freedom	Refer to Annexure-I (**Part-II**)	1
Display with all the required ports and cable connections	Refer to Annexure-I (**Part-II**)	1
Specific software requirements (Driving scene)	Refer to Annexure-I (**Part-II**)	As per the description

ANNEXURE-III: TECHNICAL BID COMPLIANCE CHECKLIST

(to be submitted along with technical bid)

Sr. No.	Criterion	Yes/No	Page No. of attachment
1	Manufacturer's Authorisation Form (MAF) from the OEM, and authorising the bidder to bid for the tender		
2	Whether the bidder has supplied similar equipment to Govt institutes or reputed firms and whether documentary proof attached		
3	Declaration that the bidder is not blacklisted by any Govt entities in India		
4	Detailed technical specifications and datasheets for all line items		
5	BoQ compliance sheet (Annexure-IV) filled in and a copy of masked commercial bid attached (as per Annexure-V)		

ANNEXURE-IV: BOQ COMPLIANCE SHEET

(to be submitted along with technical bid)

Heavy Vehicle Simulator Part	**Description**	**Quantity**	**Quoted Yes/No**
Part-I			
Driving station with static motion platform with all the required ports and cable connections	Refer to Annexure-I (**Part-I**)	1	
Display with all the required ports and cable connections	Refer to Annexure-I (**Part-I**)	1	
Software package with the capability to record data	Refer to Annexure-I (**Part-I**)	1	
Other components (hardware parts, power cables, connection cables, adapters, etc.) are required for the smooth functioning of the simulator		As required	
Part-II			
Motion platform with three degrees of freedom	Refer to Annexure-I (**Part-II**)	1	
Display with all the required ports and cable connections including projectors	Refer to Annexure-I (**Part-II**)	1	
Specific software requirements (Driving scene)	Refer to Annexure-I (**Part-II**)		

ANNEXURE-V: COMMERCIAL BID FORMAT

Bidders are required to fill-in priced bid in the following BoQ format only.

Note: The 'unit price' and 'amount' should be quoted without GST; GST amount (at a concessional rate of 5%) should be filled in the last column.

Heavy Vehicle Simulator Part	**Description**	**Quantity**	**Unit price (₹)**	**Amount (₹)**	**GST (@ 5%)**
Part-I					
Driving station with static motion platform with all the required ports and cable connections	Refer to Annexure-I (**Part-I**)	1			
Display with all the required ports and cable connections	Refer to Annexure-I (**Part-I**)	1			
Software package with the capability to record data	Refer to Annexure-I (**Part-I**)	1			
Other components (hardware parts, power cables, connection cables, adapters, etc.) are required for the smooth functioning of the simulator		As required			
Part-II					
Motion platform with three degrees of freedom	Refer to Annexure-I (**Part-II**)	1			
Display with all the required ports and cable connections including projectors	Refer to Annexure-I (**Part-II**)	1			
Specific software requirements (Driving scene)	Refer to Annexure-I (**Part-II**)				
Total bid price (Part-I)					
Total bid price (Part-II)					
Total bid price (Part-I + Part-II)					

ANNEXURE-VI: DETAILS OF PAN / GSTN OF IISC BANGALORE

PAN/GST No.:

PAN – AAATI1501J

GST No. – 29AAATI1501J2ZV