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that a judgment upon the arbitral award may be entered in any court having jurisdiction thereof.

(f) Fees and Expenses

The fees and expenses of the arbitrators and all other expenses of the arbitration shall be initially borne and paid equally by respective Parties subject to determination by the arbitrators. The arbitrators may provide in the arbitral award for the reimbursement to the successful party of its costs and expenses in bringing or defending the arbitration claim, including legal fees and expenses incurred by the Party.

(g) Performance during Arbitration

Pending the submission of and/or decision on a dispute, difference or claim or until the arbitral award is published, the Parties shall continue to perform all of their obligations under this Agreement without prejudice to a final adjustment in accordance with such award.

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ASSIGNMENT, CHARGES AND SUB-CONTRACTING

Article 23

23.1 The Concessionaire shall not assign in favour of any person this Agreement or the rights, benefits and obligations hereunder save and except with prior consent of DoT.

The aforesaid shall not apply to:

- (i) liens/encumbrances arising by operation of law (or by an agreement evidencing the same) in the ordinary course of business of the Concessionaire;
- (ii) Pledges/hypothecation of goods/ moveable assets, revenue and receivables as security for indebtedness, in favour of the Lenders and working capital providers for the Project;
- (iii) assignment of Concessionaire's rights and benefits under this Agreement to or in favour of the Lenders as security for financial assistance provided by them.

23.2 The Concessionaire shall not create nor permit to subsist any Encumbrance over the GNCTD Infrastructure Facilities.

23.3 Lenders of the Concessionaire may exercise the right of step in or substitute another person but the sole discretion to do so rests with DoT.

23.4 The Concessionaire shall not sub-contract all or any part of the Project without the prior written consent of DoT. For any sub-contracting activity, prior approval of DoT or IM shall be required to be obtained by the Concessionaire, which may be refused or granted subject to such conditions as DoT deems fit.

23.5 Where the Concessionaire sub-contracts, a part of the Project to any Person, the Concessionaire shall:

- (a) ensure that such Person is obliged to comply with all of the obligations and duties of the Concessionaire under this Agreement insofar as they relate to part of the Project which that sub-contractor is required to provide;
- (b) be responsible for payments to that Person; and
- (c) remain solely responsible and liable to the DoT for any breach of the Agreement or any performance, non-performance, part-performance or delay in performance of any of the services by any sub-contractor to the same extent as if such breach, performance, non-performance, part-performance or delay in performance had been carried out by the Concessionaire.

23.6 This Concession Agreement is personal to the Concessionaire who shall not assign, novate or otherwise dispose in whole or in part of its rights hereunder nor assign, sub-contract or otherwise delegate in whole or in part any of its obligations hereunder without the prior written consent of DoT. For the avoidance of doubt a disposal shall be deemed to include but not be limited to any reorganisation of the Concessionaire

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which would affect the Concessionaire's ability to perform any of its obligations under this Concession Agreement including without limitation any reorganisation which affects the resources, technical competence and/or financial standing (or the technical and financial resources available) to enable the Concessionaire to perform its obligations.

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MISCELLANEOUS

Article 24

24.1 Information

- (a) The Concessionaire acknowledges that DoT:
- (i) is subject to The Right to Information Act 2005 (“RTI Act”) and agrees to assist and cooperate with DoT to enable DoT to comply with its obligations under the RTI; and
 - (ii) may be obliged under the RTI Act to disclose information without consulting or obtaining consent from the Concessionaire.
 - (iii) Without prejudice to the generality of this Clause, the Concessionaire shall and procure that its sub-contractors (if any) shall:
 - transfer to the Concessionaire each information request relevant to the Project; and
 - in relation to information held by the Concessionaire on behalf of the DoT, provide DoT with details about and/or copies of all such information that DoT requests and such details and/or copies shall be provided within 5 Business Days of a request from DoT (or such other period as the DoT may reasonably specify), and in such form as the DoT may reasonably specify.
- (b) Subject to 24.1 (a), Each Party will keep confidential:
- (i) the terms of this Agreement; and
 - (ii) any and all Confidential Information that it may acquire in relation to the other party.
- (c) Neither Party will use the other Party's Confidential Information for any purpose other than to perform its obligations under this Agreement. Each Party will ensure that its officers and employees comply with the provisions of Clause 24.1.
- (d) The obligations on a Party set out in Clause 24.1 (b) will not apply to any Confidential Information which:
- (i) either of the Parties can demonstrate is in the public domain; or
 - (ii) a Party is required to disclose by order of a court of competent jurisdiction but then only to the extent of such required disclosure.
- (e) The provisions of this Clause 24.1 will survive any termination of this Agreement for a period of 5 years from termination.

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24.2 Interest and Right of Set Off

Any sum which becomes payable under any of the provisions of this Agreement by one Party to the other Party shall, if the same be not paid within the time allowed for payment thereof, shall be deemed to be a debt owed by the Party responsible for payment thereof to the Party entitled to receive the same. Such sum shall until payment thereof, carry interest at State Bank of India – Prime Lending Rate plus 2% per annum (a rate at which the bank ordinarily lends money to its best corporate customers) from the due date for payment thereof until the same is paid to or otherwise realised by the Party entitled to the same. Without prejudice to any other right or remedy that may be available under this Agreement or otherwise under law, the Party entitled to receive such amount shall also have the right of set off.

Provided the stipulation regarding interest for delayed payments contained in this clause shall neither be deemed nor construed to authorise any delay in payment of any amount due by a Party nor be deemed or construed to be a waiver of the underlying breach of payment obligations.

24.3 Governing Law and Jurisdiction

This Agreement shall be governed by the laws of India subject to Article 22, the Courts at Delhi shall have jurisdiction over all matters arising out of or relating to this Agreement.

24.4 Waiver

- (a) Waiver by either Party of any default by the other Party in the observance and performance of any provision of or obligations under this Agreement:
- (i) shall not operate or be construed as a waiver of any other or subsequent default hereof or of other provisions or obligations under this Agreement;
 - (ii) shall not be effective unless it is in writing and executed by a duly authorised representative of such Party; and
 - (iii) shall not affect the validity or enforceability of this Agreement in any manner.
- (b) Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation hereunder nor time or other indulgence granted by a Party to the other Party shall be treated or deemed as waiver/breach of any terms, conditions or provisions of this Agreement.

24.5 Survival

Termination of this Agreement:

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- (a) shall not relieve the Concessionaire or DoT of any obligations already incurred hereunder which expressly or by implication survives Termination hereof, and
- (b) except as otherwise provided in any provision of this Agreement expressly limiting the liability of either Party, shall not relieve either Party of any obligations or liabilities for loss or damage to the other Party arising out of or caused by acts or omissions of such Party prior to the effectiveness of such Termination or arising out of such Termination.

24.6 Amendments

This Agreement and the Schedules together constitute a complete and exclusive understanding of the terms of the Agreement between the Parties on the subject hereof and no amendment or modification hereto shall be valid and effective unless agreed to by all the Parties hereto and evidenced in writing.

24.7 Notices

Unless otherwise stated, notices to be given under this Agreement including but not limited to a notice of waiver of any term, breach of any term of this Agreement and termination of this Agreement, shall be in writing and shall be given by hand delivery, courier, mail or facsimile transmission and delivered or transmitted to the Parties at their respective addresses set forth below:

If to DoT

Secretary and Commissioner, Transport
Government of National Capital Territory of Delhi
 5/9, Under Hill Road
 Delhi 110054
 Fax No. 011-23933069

If to the Concessionaire

_____,
 _____,
 _____,

 Fax No. -----

Or such address or facsimile number as may be duly notified by the respective Parties from time to time, and shall be deemed to have been made or delivered (i) in the case of any communication made by letter, when delivered by hand, by courier or by mail (registered, return receipt requested) at that address and (ii) in the case of any communication made by facsimile, when transmitted properly addressed to such telex number or facsimile number.

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24.8 Severability

If for any reason whatsoever any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties shall negotiate in good faith with a view to agreeing upon one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable. Failure to agree upon any such provisions shall not be subject to dispute resolution under this Agreement or otherwise.

24.9 No Partnership

Nothing contained in this Agreement shall be construed or interpreted as constituting a partnership between the Parties.

24.10 Language

All notices required to be given under this Agreement and all communications, documentation and proceedings, which are in any way relevant to this Agreement shall be in writing and in English language. However, where-ever required, based on DoT guidelines/ instructions, necessary documentation shall be required to be prepared in Hindi, also.

24.11 Exclusion of Implied Warranties etc.

This Agreement expressly excludes any warranty, condition or other undertaking implied at law or by custom or otherwise arising out of any other agreement between the Parties or any representation by any Party not contained in a binding legal agreement executed by the Parties.

24.12 Counterparts

This Agreement may be executed in three counterparts, each of which when executed and delivered shall constitute an original of this Agreement but shall together constitute one and only the Agreement.

IN WITNESS WHEREOF THE, PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

SIGNED SEALED AND DELIVERED

For and on behalf of DoT By

SIGNED, SEALED AND DELIVERED

For and on behalf of _____
(Concessionaire) by:

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_____ (Signature)

_____ (Signature)

_____ (Name)

_____ (Name)

_____ (Designation)

_____ (Designation)

In the presence of:

1.

_____ (Signature)

_____ (Name)

_____ (Address)

2.

_____ (Signature)

_____ (Name)

_____ (Designation)

_____ (Address)

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Cluster Operations Detail	Schedule 1
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1.0 This scheduling plan refers to specific routes in each Cluster as a Unified Time Table (UTT) both for the DTC and the Concessionaire. The scheduling of bus services varies according to the days of week and the time of the day. Each trip has a starting time & location and a destination time & location.

2.0 The following are objectives of the scheduling plan:

- (a) Integration of the Bus Time Table with other modes of existing and proposed public transport
- (b) The Unified Time schedule for both DTC and the Concessionaire
- (c) Reducing service overlaps
- (d) The minimization of layover and dead running
- (e) Time sequence feasibility of trips
- (f) The provision of bus service at regular intervals.

3.0 The schedule may be reviewed after an initial period of bus operation with a view to improve service delivery and fleet utilization.

3.1 The Scheduling Plan

The schedule will require provisioning buses between DTC and the Concessionaire, generally in the ratio of 50:50. This total excludes buses held in reserve for maintenance. However, the actual deployment of DTC buses may vary due to various other factors.

Currently, the scheduling plan has been prepared on Unified Scheduling Method, i.e. buses will take equal time to complete the trip and don't provide rest time for the crew. The Concessionaire shall prepare a duty chart for employees classified as a 'Motor Transport Worker' as per the conditions of 'Motor Transport Workers Act, 1961'.

3.1.1 Differential Scheduling Method

As better vehicle mobility data becomes available, the IM will prepare the UTT using Differential Scheduling Method. The Differential Scheduling Method assumes that buses take lesser time during non-peak hours to complete their journeys compared to peak hours. This method will increase the fleet efficiency. The schedule for each route will be prepared on the same principle.

3.2 Night Services

The service is proposed to be planned in such a way that the buses will be available on each route from early morning to late at night. IM will also

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operate “Night Bus Services” on selected routes, with frequency upto 1/5th of the day frequency.

Route details and the time table will be provided to the Concessionaire by the IM.

3.3 Special Schedules

Special Schedules for specific occasions such as Holi, Diwali, Rakshabandhan etc. will be prepared from time to time with a view to meet additional traffic demand and the Concessionaire needs to comply with the notified schedules.

3.4 Effective Operational Days

UTT is prepared for weekdays, weekends and Public Holidays. The total number of weekdays is 309, and the total number of weekends and public holidays is 56 days. Weekends & Public Holidays include Sundays (52 Days) and four public holidays – Independence Day, Republic Day, Gandhi Jyanti and Holi.

Note:

- (1) IM will provide the detailed UTT to the concessionaire during the operational stage.**
- (2) Cluster Details as Set out in Part III of RFQP Document form part of this Schedule.**
- (3) DoT may undertake Route rationalization study any time during Concession Period, based on the outcome of the study routes are subject to change.**

1.0 Introduction

1.1 Stage Carriage buses shall conform to the Specifications set out in this Schedule. The minimum Technical Specifications have been set out for following types of Stage Carriages:

Low Floor Fully Built AC Pure Electric Standard Size (12Metre) Buses.

- 1.2 The word “bus” shall mean the Stage Carriage to be used for the Project.
- 1.3 The word “bus” shall also mean a bus powered exclusively by an **Electric Motor whose traction energy is supplied exclusively by traction battery** installed in the vehicle suitable for operations in city conditions in Delhi.
- 1.4 The Bidder shall comply with all applicable Central, State and local laws (including Acts, Rules & Regulations).
- 1.5 The word “Bus” wherever it has been used in the specification (Schedule-2) means the “**Battery Operated Bus**”. The bus in general shall meet all applicable Central Motor Vehicles Rules, 1989 as amended (hereinafter referred to as “CMVR”), norms for safety applicable on the date of manufacture and Bus Code AIS 052 and any revisions thereof [hereinafter called Bus Code] and all other norms and regulations on high voltage electric vehicles.
- 1.6 The bus design shall be energy efficient, environmentally friendly, safe and secured for transportation of passengers besides the following main attributes amongst others:
- i) Passenger comfort
 - ii) Ergonomically designed driver’s work area
 - iii) Ease of repair and maintenance
 - iv) Aesthetically designed interiors and exteriors
 - v) Ease of boarding and alighting for all passengers
 - vi) Safety, reliability & durability
 - vii) Energy Efficient
- 1.7 Where there is conflict between the requirement as per any applicable law in force and the requirement emanating from these specifications whichever of these two is of superior/ higher standard shall prevail. Also, any specifications superior to the ones set out as Minimum Technical Specifications shall meet requirements of the contract.
- 1.8 Source of Data:

BIS Standards are available from Bureau of Indian Standard, Manak Bhawan, 9-Bahadur Shah Zafar Marg, New Delhi-110 002. Web site: <http://www.bis.org.in>. Similarly, AIS Standards are available from Automotive Research Association of India, Post Box No.832, Pune-411 004. Web site: <http://www.araiindia.com>. ASRTU Specifications are available from Association of State Road Transport Undertakings, ASRTU Bhavan, Plot No 4A, PSP Block, Pocket-14, Sector-8, DWARKA, New Delhi-110 075. Web site: <http://www.asrtu.org> , E-mail address: asrtu@de12.vsnl.net.in , UBS-II Link: <http://www.indiaenvironmentportal.org.in/files/file/Urban-Bus-Specifications-II.pdf>

2.0 General Design Features

- 2.1 The full forward control pure electric city bus shall have right hand drive design and be fitted with **Electric Motor(s)**. The bus shall be designed and manufactured in accordance with the specifications & AIS-052: Code of Practice for Bus Body Design & Approval [Bus Code] amended up to date. The bus shall be designed to carry commuters including in the city area with ease of boarding and alighting especially for ladies, children & senior citizens. The bus design shall be suitable for daily operation of 16 to 20 hours in city service with peak loading of over **100 passengers** [68 Kgs + 7 Kgs=75 Kgs each], average traveling speed of about 15 Kms per hour with starts/stops after every 200 to 300 m. To take care of the peak over load of about 20% the bus has to have buffer motor capacity in terms of KW to pull this load comfortably over a gradient of 17%, for which the Tyre rating should be such that it meets the requirement of peak hour loading.
- 2.2 The bus design shall be eco-friendly, energy efficient, safe, and comfortable & further improved standard as applicable on the date of manufacture]. Bus and complete aggregates shall comply with the rules and regulation with respect to safety notified and mandated time to time by the government and applicable at the time of the delivery and the registration of the buses. To ensure compliance, type approval certificate from the approved test agency under CMVR will be necessary for the Fully-Built Bus for the applicable rules, regulation and specifications laid herein. **The procurement of only fully-built bus will be permitted.**
- 2.3 Ambient Conditions: The bus must be having proven design suitably modified to the climatic & operational conditions, infrastructure and road conditions in Delhi. Typical operating conditions could be temperatures of approximately 0° to 50°C, humidity level from 5% to 100%, and altitude up to 300 m. Concessionaire is strongly advised to ensure that buses are able to meet the severe temperature, water, humidity, height from mean sea level, rain fall conditions of Delhi during operation.
- 2.4 The bus design should be such as to meet all statutory requirements applicable for the city of Delhi in all respects. Further, the bus structure should meet the requirements of structural strength, stability, deflection, vibration, etc. amongst others for at least the following main loads:

- Static loads
- Dynamic loads
- Single wheel bump loads
- Double wheel bump loads
- Braking and acceleration loads
- Speed Breakers, road bumps & pits, induced loads

2.5 The bus design and the buses shall meet all the statutory requirements besides the one prescribed herein and type approval certificate of compliance from the approved test agency for the complete bus as per specifications laid herein/in CMVR will have to be produced. **The performance and efficiency eligible criteria for Electric Buses to comply as notified by Department of Heavy Industries vide Notification dated 21.06.2019. The maximum Electric Energy Consumption shall be less than 140 KWh/ 100 Km. The measurement shall be carried out as per FAME II Eligibility Assessment Procedure**

2.6 The material used in the construction of buses shall be as per Bureau of Indian Standards (BIS)/ Automotive Industry Standards (AIS) specifications. In absence of above specifications, Association of State Road Transport Undertakings (ASRTU) specifications could be followed. Wherever Indian standards are not available, internationally acceptable standards may be referred/ followed.

2.7 The bus shall be designed and manufactured with all applicable fire safety regulations on urban transit buses for prescribed upholstery material, fire retardant cables, connectors etc. These provisions shall include the use of fire retardant, fire detection systems, firewalls, and facilities for passenger evacuation (doors, windows and escape hatches) as per statutory requirements in addition of the Bus Code. Flammability requirements shall comply with IS 15061.

2.8 The bus design will meet all statutory requirements besides the one prescribed herein, CMVR and type approval certificate of compliance for the Fully-Built Bus from the approved test agency will have to be produced at the time of submitting the prototype. The bus shall be designed with respect to its body and different aggregates/ systems/ sub systems to operate in city service for 12 years or 10,00,000 km whichever is earlier.

2.9 **FIRE SAFETY:** The bus shall be designed and manufactured with all applicable fire safety regulations under CMVR/ Bus Code for safety for electric buses for prescribed upholstery material, fire retardant cable, connectors etc. These provisions shall also include the use of fire-retardant material, fire detection system, fire walls and facility for passenger evacuation [doors, windows and escape hatches] as per statutory requirements besides Bus Code. Flammability requirements shall comply with IS 15061 as specified in CMVR.

3.0 Electric Drive Engine(s)

- 3.1 Electric Drive Engine(s) and energy storage capable of providing sufficient horsepower to obtain desired performance in respect of defined acceleration levels. The drive engine(s) should have adequate horsepower not only to propel the bus but also to operate all other auxiliary devices fitted directly to them/it if any. The electric drive engine(s) can be designed as one central electric engine propelling the rear axle via a shaft and a differential or as two-wheel axle or hub engines. A high energy efficiency of the drive engine(s) is required. The engine shall be designed to operate for not less than 900,000 km without major failure or significant deterioration.
- 3.2 The electric drive engine(s) must have a generator function for recuperating braking energy (kinetic energy). The degree of recuperation must be adaptable by the operator.
- 3.3 The drive engine and its accessories shall be easily replaceable. The engine mounting shall be such as to minimize transmission of vibrations to the bus structure.
- 3.4 The drive engine(s) should be suitably designed to operate optimally under Delhi's peak summer heat and dust.
- 3.5 Engine noise must confirm to the Central Motor Vehicle Rules (CMVR)/AIS /any other applicable Indian standards. In case of multiple norms, the most superior of these is to be adopted and as applicable for the city of Delhi.
- 3.6 The mounting of the drive engine(s) and the drive engines themselves must be designed to avoid rain or high-pressure washing system water from entering into the drive engine(s).
- 3.7 Additional important performance requirements as per urban bus specification are as given in the table below

Table 1: Some of the salient technical requirements of AC bus

Sr. No	Parameter Description	Specification
1	Engine Power to GVW	As per AIS:153 subject to meeting design requirements on peak load
2	Acceleration	As per AIS:153 or ≥ 0.8 m/sec/sec minimum at adequate Horse Power, whichever is superior
3	Speed 0 – 30 Kmph	As per AIS:153 or ≤ 10.5 sec maximum, whichever is superior
4	Gradability (stand-start)	17% minimum
5	Maximum Speed at full load (GVW) (without Speed Limiter)	75 Kmph

- 3.8 The acceleration shall meet the requirements as stated above and shall be sufficient gradual and smooth to prevent throwing standing passengers off balance.

3.9 **Speed Limiting Device**

Maximum speed of bus will be limited to 40kmph or as prescribed in the city of Delhi through engine management system at the time of manufacturing stage itself. Any amendment thereto should only be possible by the vehicle manufacturer at the written instructions of the Transport Department of the state concerned. Type approval certificate from ICAT/ARAI / or any other test agency specified in CMV Rule 126 will be necessary for proper functioning of the speed limiting device as per AIS 018/2001 or latest. An audio-visual signal shall be provided for on dashboard/instrument panel when the system performs speed limiting function. The malfunctioning of the system shall also be signaled suitably at dashboard instrumentation.

4.0 **High voltage system**

- 4.1 The high voltage system consists of
- the traction energy storage,
 - the electric drive engine,
 - power electronic components like inverters or converters,
 - cabling, and
 - additional equipment like fuses, switches etc.
- 4.2 The high voltage system must conform to all applicable norms, standards and regulations for electric vehicles. The manufacturer must provide a list of norms, standards and regulations to which the buses conform.
- 4.3 The high voltage must be separable from the traction energy storage by a suitable installation.
- 4.4 Two emergency circuit breakers must be installed at each bus, one next to the driver's seat and one at an easily accessible compartment that can be accessed from outside the bus. The emergency breakers must switch off the high voltage system completely and must be secured against unintentional switching on.
- 4.5 The bus must be equipped with measurement points where the actual voltage at the high voltage system can be measured.
- 4.6 Each bus must be equipped with a safety card, which explains the high voltage system and provides information on safety aspects for rescue workers.
- 4.7 Any critical failure in the high voltage system including the electric drive engine(s) and the traction energy storage must be displayed at the dashboard in a suitable way.

5.0 Traction energy storage and charging infrastructure

- 5.1 The buses must be equipped with suitable traction energy storage with advance battery viz. Lithium Ion Battery that meets the requirements regarding acceleration.
- 5.2 The traction energy storage must be placed in one or several compartments which protects it against heat, water and dust. The compartments should not be located at damage prone areas of the bus.
- 5.3 The traction energy storage must provide at least 80 % of its original energy content over a distance of 500,000 km or five years, taking the ambient conditions as described above into consideration.
- 5.4 The traction energy storage must be suitable to meet the ambient conditions and the operational conditions as described in Para 2.0 of Schedule 2. The traction energy storage must be equipped with a suitable cooling system that takes the climate conditions in Delhi into consideration.
- 5.5 The state of charge (SOC) must be displayed on the driver dashboard in a suitable way. Optionally, an estimation of the remaining range is to be displayed in addition.
- 5.6 The traction energy storage must be sufficient for a minimum autonomy of 120 kms/ bus/ day to meet the operational conditions as described in Para 2 of Schedule 2 for a daily driving range of minimum 240 kms excluding dead kms for recharging. The Concessionaires shall get the specifications including the range of the bus certified from the approved agencies under the CMVR at the time of prototype approval of the bus. The testing agency should also certify that the bus model which is being certified meets the range of 120 kms autonomy (distance that can be driven with a usable energy content of a battery without recharging). The minimum range of the battery at the time of induction should take into account the degradation profile of the battery as per technical documentation of the battery and the traffic conditions in Delhi.

The bus shall have a minimum range of 120kms on a single charge (i.e. minimum autonomy) throughout its lifecycle which shall be verified by testing specifications. In case such proof tests cannot be undertaken by the testing agency acceptable to DoT, closest feasible safeguard shall be identified in consultation with the testing agency to ensure the range of 120km per charge is achieved throughout the lifecycle of the bus.

5.7 Charging Specifications and Standards:

- charging standard: CCS in its latest version
- grid connection: 400 VAC
- availability of charging devices: 97 %
- availability of charging stations: 99 %
- maximum time to recover: 24 hours (stations) / 72 h (devices)
- length of cables for gun charging: max. 10 m, to be customised
- maximum base area of charging devices: 800 x 800 mm for 50 kW charging power
1,000 x 900 mm for 75 kW charging power
1,000 x 1,200 mm for up to 150 kW charging power
- maximum base area of charging stations: 2,000 x 2,000 mm for up to 250 kW charging power
- maximum noise emissions: 72 dB(A)
- degree of efficiency: > 90 % (between input and output)
- ventilation at terminals: in the direction of the buses
- parking tolerance required by automated contact systems: ± 400 mm in driving direction
± 150 mm in lateral direction
2° angular deviation
- IP level: IP 67 preferred
min. IP 54

The necessary charging infrastructure must comply with all norms, standards and regulations applicable and must be described by the supplier in detail. **The charging standard shall be as per the standards notified by BIS or any other Indian agency tasked with the said responsibility.** In case there is no BIS charging standard for buses is available by the time of supply of buses, the aforesaid minimum requirements of charging specifications alongwith compliance to any international charging standard like CCS, GB/T shall have to be followed.

6.0 Suspension

- 6.1 The bus shall be fitted with air bellow suspension at front and rear. The suspension system shall be fitted with shock absorbers, suitable for trouble free operation and jerk free comfortable ride in existing road conditions of Delhi. The air suspension should be adequately protected from engine/ exhaust pipe heat etc for minimizing ageing effect on the air bellows.
- 6.2 The full air suspension system both at front & rear shall be with stabilizer bar and kneeling arrangement of minimum 60 mm at front & rear left side severally and/ or simultaneously. The reference point of measurement of kneeling shall be the centre line of exit & entrance at bus floor level under unladen conditions.
- 6.3 If the traction energy storage is put on the roof, the suspension system must take the additional weight into consideration.

7.0 Steering

Hydraulic power assisted recirculating ball type steering shall be provided.

8.0 Braking System

- 8.1 The braking system must consist of the generator function of the electric drive engine(s) (electric brake) and a full pneumatic braking system with dual circuit having four-way protection valve, auto slack adjuster, with non-asbestos brake lining (Disc at front and drum at rear).
- 8.2 Most of the braking must be done by the electric brake for energy recuperation. The recuperation function (degree of recuperation) must be adaptable.
- 8.3 At low speed and in case of high braking force, the electric and the pneumatic braking systems must blend into each other to provide a smooth braking.
- 8.4 The permanent braking function is provided by the electric brake. Excess electric energy recuperated during braking which cannot be stored into the energy storage or consumed by auxiliaries must be “destroyed” at a braking resistor or similar device for excess energy intake.
- 8.5 The friction material shall be non-asbestos type having temperature and wear characteristics suitable for intensive city operation. The buses shall also be provided with hand operated pneumatic flick valve type parking brakes at rear wheels. The air pressure line shall be treated for corrosion resistance.
- 8.6 In the event of failure of the drive engine(s) and or loss of air in the system, adequate provision should be there for obtaining effectiveness of service brake system and or for deactivating the spring actuated brakes.

8.7 The bus shall be fitted with Anti-Lock Braking System conforming to IS:11852:2003 as per G.S.R. 389(E) dated 9.06.2014 as per latest requirement under CMVR.

8.8 An additional provision for parking brakes is also to be provided to prevent auto application of parking brakes due to loss of pressure in the main service line.

9.0 Wheels and Tyres

9.1 Low floor Bus shall be fitted with tyres of size 11R22.5 or equivalent size, 16 PR steel radial tubeless tyres conforming to AIS-044 Part I with wheel rims of corresponding size conforming to AIS/ BIS: 10694 (part 3)-1991 or latest.

9.2 Suitable guards conforming to the relevant AIS standard as prescribed in CMVR shall be provided as spray suppressors as well as for protection against small stones hurled from tyres.

10.0 Axles

The bus shall be driven by heavy duty axle at the rear with adequate capacity to take care of maximum GVW & crush loading expected during life span of the bus. Transfer of drive engine(s) noise and noise from the differential to the bus interior shall be minimized. The drive shaft shall be guarded to prevent it striking the floor of the coach or the ground in the event of a tube or universal joint failure.

11.0 Protection Against Fire Risk

11.1 A fire detection system must be installed at the traction energy storage compartment(s). In case of fire, the system must inform the driver in a suitable way.

11.2 All legal requirements regarding the fire protection of buses including the use of high voltage batteries must be fulfilled.

12.0 Under frame & Structure

12.1 The under frame and super structure shall be suitably designed to carry dense crush load of over 100 passengers (assuming an average weight of $68+7=75$ kgs. per passenger) including sitting and standees, traction batteries, bus tare weight, etc. Moreover, the structure shall be designed to withstand the transit service condition of operation in Delhi during its life span.

12.2 The bus shall be of integral construction as defined in Bus Code with the super structure fabricated using steel tubing (ERW– Rectangular / Square Sections) conforming to BIS 4923-1985 or latest, of grade Yst –240.

- 12.3 The comprehensive multi-stage anti-rust treatment by way of hot phosphating/ galvanizing shall be provided to bus flooring, sides, roof, under-structure, as per BIS 3618 Class-A2/ Galvanizing of MS Structural Members as per IS:277-2003 120 GSM coating for resistance to corrosion or deterioration from atmospheric conditions & road salts so as to enable them & frame to last for at least 12 years or 10,00,000 km whichever is earlier. The samples of all materials & connections shall withstand two weeks (336 hours) Salt Spray test in accordance with ASTM procedure B117 with no structural detrimental effect to normally visible surfaces & no weight loss of over 1%. The details of treatment along with certificate shall be provided with relevant specification to meet the service life of minimum 12 years or 10,00,000 km whichever is earlier. The system of corrosion prevention of the internal surfaces of structural tubing shall be provided and details of the same be given in the offered documents.
- 12.4 After anti corrosive treatment, structural members shall be coated with red oxide/ Zinc Chromate primer & superior quality black paint.
- 12.5 Sufficient clearance & air circulation shall be provided around the tyres, wheels & brakes to preclude over-heating when the bus is operating
- 12.6 Under floor to sidewalls shall be sealed to prevent dust ingress.

13.0 Panelling

- 13.1 The bus exterior side panels shall be fitted with stretched GI sheet at waist level. The exterior front-end panelling shall be of steel sheet or FRP. Roof shall be of Al sheet. Rear shall be of GI sheet or FRP. Skirt panelling shall be of Aluminium sheet having thickness of minimum 1.5 mm. Adequate treatment be also provided to avoid any incidence of galvanic corrosion between dissimilar metals. Panels shall not have any waviness & shall be so mounted as to present smart aesthetic exteriors. The exterior front-end paneling and Rear paneling of Fibre Re-inforced Polymer (FRP), 3 layer, 450gsm, with equivalent performance will also be acceptable.”
- 13.2 Anti-drumming compound or High Pressure Laminate (HPS) shall be applied on inner side (enclosed surfaces) of entire paneling.
- 13.3 Roof structure shall be thermally insulated with flame retardant Polyurethane or glass wool of minimum 40 kgs/m³ density. The bidder shall provide specifications/ BIS standards for the aforesaid insulating material.
- 13.4 Rain gutters shall be provided to prevent water flowing from the roof onto the passenger doors, driver’s side window, and exterior mirrors. When the bus is decelerated, the gutters shall not drain onto the windshield, or driver’s side window, or into the door boarding area. Cross sections of the gutters shall be adequate for proper operation.
- 13.5 Interior paneling (sides and roof) shall be PVC coated GI Sheet. Panels & fasteners shall not be easily removable by passengers.

- 13.6 The skirt panel shall be openable fitted with stainless steel piano type hinges (heavy duty), to be fitted at the rub rail for the ease of maintenance purpose. However, the fixed skirt panel may not be in openable position like at wheel arches. The openable skirt panels shall be bolted at skirt level.

14.0 Paints

- 14.1 All the structural members of the bus shall be treated for corrosion prevention internally as well as externally and painted wherever required. The Polyurethane (PU) painting conforming to BIS: 13213-1991 or latest shall be used for exteriors painting of the bus including interiors wherever required. Colour shade shall match to the shades as per BIS: 5-1978 or latest. In case of Matt black paint the same shall be tested as per IS: 13213-1991 or latest except the gloss value should be upto 30 units.

- 14.2 All exterior surfaces shall be smooth & free of wrinkles & dents. Finished painted surface of the bus should be free from the following imperfections:

- a. Blisters or bubbles appearing in the topcoat film.
- b. Chips, scratches, or gouges of the surface finish.
- c. Cracks in the paint film.
- d. Craters where paint failed to cover due to surface contamination.
- e. Overspray.
- f. Peeling.
- g. Runs or sags from excessive flow and failure to adhere uniformly to the surface.
- h. Chemical stains and water spots.
- i. Dirt particles embedded in the paint.

15.0 Colour Schemes

Exterior, interior colour schemes and logo/ graphics to be applied will be as notified by Transport Department, Govt. of NCT of Delhi. The buses must be recognizable as environmentally friendly battery buses.

16.0 Service doors

- 16.1 Two service doors (Entrance & Exit) in 1200 mm wide clear aperture (without flaps) shall be fitted at front and middle nearside of the bus as per provisions of the AIS 052 (Bus Code) for Type I, SDX category. Door aperture without flaps shall be 1200 mm min., and fully opened clear door width shall be 1050 mm \pm 50 mm with door height of 1900 mm min.

- 16.2 Front door shall be located ahead of front axle whereas rear door shall be positioned such that rear edge of gate shall be at minimum 1500 mm ahead of central line of rear axle or front edge of gate minimum 1500 mm behind central line of rear axle.

- 16.3 The entrance and exit doors shall be electro-pneumatically controlled / (suitably Automated) by the driver and/or the conductor with internal and external controls for emergency opening. In the event of an emergency, it shall be possible to open the doors manually from inside the bus after deactivating pneumatic controls of each door. All door components, latches, locks and door hinges shall be as per AIS 052 Bus Code
- 16.4 Safety provisions as mentioned in Bus code for automated Section 3.4 of AIS 052. Anti-pinching feature shall be provided so as to avoid trapping of passenger during closing of door. Additionally, actuation of automated door under normal conditions shall not be possible when Bus is in motion.
- 16.5 An audio-visual signal shall be provided at the service doors for the convenience of passengers that shall be affected during the door opening and closing cycle and for the entire duration of door in open condition.
- 16.6 All footsteps and exits (both service and emergency) shall be provided with anti-skid yellow nosing.
- 16.7 Both the entrance and the exit doors shall be of inside swing type or double jack knife type. Service doors shall be provided with grab handles.
- 16.8 Manually operated sunken type wrap over ramp for wheel chair of Persons with Disability (PwD) shall be fitted preferably at front or central door on the floor for ease of supervision. The ramp shall have width of 900 mm min. with anti-slip coating and load carrying capacity of 300 kg. min. Provision of anchoring of wheel chair shall be made suitably such that anchored wheel chair shall not create undue hindrance to free flow of movement of other fellow commuters. Suitable provisions shall be made for visually impaired commuters also necessary provisions to comply the requirements of Disabilities Act 1995.
- 16.9 Foot step lighting: Suitable lighting source shall be provided that shall get actuated upon switching on headlights and door opened condition. It shall provide adequate ground illumination next to service doors for the distance of 1000 mm from the edge of foot step.

17.0 Guard/ Guard Rails

Where seated passengers are likely to be thrown into service doors entrance/exit area as a result of heavy braking, suitable guard shall be provided. The guard height shall be minimum 800mm from the floor, and the guard shall extend inward from the wall at least 100mm more than the centre line of the seating position of the passengers who are prone to this risk. The guarding shall be as per the provisions of the Bus Code.

18.0 Windows

For window and other glasses, it shall be tinted and toughened safety glasses as per IS 2553 (Part-2)–1992/latest of 4.8-5.3 mm thickness and AIS 052 Bus Code. The windows shall be **single piece fixed glass type design**. Windows shall have provision of suitable sealing to avoid ingress of dust and water and shall have proper/ efficient drainage system.

19.0 Emergency Exit

- 19.1 Emergency exits shall be provided in the bus as per the provisions of the Bus Code/ CMVR.
- 19.2 Total number emergency doors/ exit/ aperture shall be minimum two as per the Bus Code.
- 19.3 At least one emergency exit of size 1250 x 550 mm shall be provided on opposite side of the of the service door.
- 19.4 One escape roof hatch having inscribed area of 70 x 50 cm shall be provided as emergency exit.
- 19.5 The Bidder shall also provide one additional ejectable type window open from inside for emergency exit or one breakable window on right hand side in addition to minimum two numbers of emergency exits as per the Bus Code/ CMVR.
- 19.6 For emergency exit purpose, service doors equipped with power operated system shall be provided with mechanism to be readily operable by hand.

20.0 Floor

- 20.1 The floor level of bus shall be at a maximum height of 400 mm from the ground level in unladen condition. The floor shall be flat except wheel arches on which seats can be located. Low floor area shall not be less than 50% of the total saloon area (excluding front wheel boxes and driver's cab) and shall not be ramped in the longitudinal plane. The floor slope shall not exceed 6%.
- 20.2 Floor shall be constructed with 19 mm thickness phenolic resin bonded densified laminated compressed wooden floor board (both side plain surface) having density of 1.2 gm/cc conforming to IS 3513 (Part-3): type VI 1989 or latest. The flooring should also be boiling water resistant as for marine board IS 710-1976/ latest and fire retardant as per IS 5509-2000 (IS 15061:2002). The floor shall be coated with Anti-skid material of 3 mm thick anti-skid type silicon grains ISO: 877/76 for colour, IS: 5509 for fire retardancy.
- 20.3 Provision for wheel chaired disabled person for easy ingress, locking the wheel chair during motion and easy egress shall be made.

21.0 Gangways

The gangway shall be as per the provisions of the AIS 052 Bus Code and would meet the statutory requirements. Minimum interior head room at the center line of gangway shall be 1900 mm minimum as per Bus Code.

22.0 Handrails and Handholds

The handrails and handholds (strap hangers) shall be provided as per provision of bus code. The surface of handrails & handholds shall be slip-resistant. Depending upon the size of the bay (i.e. between two consecutive roof hand rail brackets), minimum 2 to 4 numbers handholds per bay shall be provided so that every standee passenger is able to grab a hand hold. Hand holds shall comply with AIS 046.

Handrails must have a colour that sets them into contrast to the background. The covering of the handrails must remain high quality during the whole lifetime of the buses.

23.0 Stanchions

Vertical stanchions shall be so positioned to facilitate access to seats for those standing. The stanchions shall comply with UBS II spec with tubing with PVC sleeve or powder coated. Each stanchion shall be provided with buzzer switch at the height of 1200 mm max for the convenience of passengers to announce their wish to alight the bus.

24.0 Passenger Seats

24.1 The seats (design, spacing and sizing) and its anchorages shall comply AIS 052 Bus code specification for Semi DLX type and AIS 023. The passenger seats preferably should be front facing, (in case rear facing seats are provided, suitable head restraint complying applicable AIS standard.) comfortable, durable & maintenance free of 'PP-LD' (Polypropylene Low Density)/ LDPE moulded construction meeting the performance requirements of AIS 023 and other requirements as per the Bus Code. The PP-LD/LDPE moulded seat shall be appropriately fitted with moulded flame retardant Polyurethane (PU) cushion for seat & back rest as per Bus Code. The seats shall be upholstered with waterproof expanded vinyl coated fabric to match the seat & interior décor conforming to IS 8698 of Class-A, Grade-I, Type-A. Suitable integral type seat hand grab rails shall be provided, one on top of backrest & one at the back of backrest, for seated passengers. However, the seat pitch shall be as per AIS 052 . A hand rest shall be provided to the gangway side of passenger seats on isle side.

24.2 The seating lay out should be in 2x2 layouts meeting the bus code requirements.

25.0 Seat Belts and its Anchorages

Seat belts shall be provided for the seats as per the provisions of CMVR & the Bus Code. Seat, Seat belts and its anchorages shall conform to the requirements of AIS 023, AIS 005 and AIS 015. It is applicable for driver seat only.

26.0 Driver's Work Area

- 26.1 A driver door of not less than 1600 mm height and 650 mm wide, with maximum space for sliding window using the material like glazing & glass as used in the other side window glasses, shall be provided for entry and exit to driver's work area. The hand holds, steps and all other requirements of driver's work area shall be as per the provisions of the AIS 052 Bus Code. The driver's work area shall have a light to provide general illumination and it shall illuminate the half of the steering wheel nearest to the driver. Brake, Clutch Pedal angle shall be determined from a horizontal plane regardless of the slope of the cab floor. Specific attention shall be provided to this driver's work area to provide pleasing and healthy working atmosphere / conditions, minimize work load and operational fatigue through automation and ergonomic design.
- 26.2 **Driver's seat-** The Driver's seat with head restraint shall meet the requirements of AIS 023. The seat shall be adjustable in horizontal & vertical axes with a provision of adjustment of Torso angle. The seat shall have pneumatic spring for ride comfort.
- 26.3 **Driver partition-** The Driver partition shall be provided as per the AIS 052 Bus Code. The partition glass shall be tinted to minimize the glare & reflection in the windscreen directly in front of the barrier from interior light during night operation.
- 26.4 **Driver's Barrier assembly -** A Driver's Barrier assembly shall be fitted in driver's cab. The specifications as provided by the OEM shall be acceptable. The manually operated driver barrier assembly shall be provided before the front Exit door for the protection of the passenger standing near the gate in the gangway of the driver cab. The driver shall be able to operate the barrier assembly easily while sitting.

27.0 Dashboard Instrumentation and Control System

- 27.1 The bus shall have aesthetically and ergonomically designed dash board and instrument panels molded in suitable polymeric material. All the dashboard controls and instrumentation system shall be as per the bus code. The bus shall have dash board with full instrumentation panel containing meters and gauges to indicate important parameters like air pressure in brake tanks, coolant temperature, battery charging current, fuel level, side indicators, head lights,

hand brakes, engine oil pressure etc. In addition, warning lights for low engine oil pressure, high cooling system temperature & low coolant level, low air pressure and battery weak shall be provided at the driver's dash board. There should also be provision for inter lock between door exit/entry door open and vehicle move moment i.e. vehicle should not move if any of the door is open. The illumination of the self-lighted symbols shall be adequate to be easily seen during day time ambient light in the driver's compartment.

28.0 Rear-view Mirrors- Interior and Exterior

Rear-view mirrors shall be provided on both sides of the bus to enable driver to have clear side/rear views. One interior rear-view mirror shall also be fitted for viewing passenger saloon area by the driver. Installation and performance requirements of the rear-view mirrors shall conform to AIS 001 and AIS 002. Additionally, front bumper-vision mirror shall be provided.

29.0 Sun Visor

Adjustable sun visors shall be provided for the windshield & the driver's side window. Visors shall be shaped to minimize light leakage between the visors & windshield. Visors adjustment shall be made easily by hand with positive locking & releasing devices and shall not be subject to damage by over-tightening. Sun visor construction & material shall be strong enough to resist breakage during adjustment. Visors wherever deployed shall be effective in the driver's field of view at angles of more than 5° above horizontal.

30.0 Destination Boards and Public Information System

30.1 Alphanumeric Dual Display Technology Amber colour LED based electronic route display system in English and Hindi of high intensity illumination with automatic brightness control shall be installed at the front, rear and side of bus with GPS feed triggered display on internal display board and announcement of name of approaching bus-stop inside the bus. Destination boards should comply with IS 16490 BIS standards and the certificate of compliance should be produced at the time of inspection of prototype from approved test agency under CMVR. Detailed compliance to specifications contained in IS 16490:2016 with latest Amendments--LED Destination Board System for Buses – Specifications has to be adhered to.

30.2 The compliance of regulatory standard as per AIS-052 (As applicable on date of manufacturer) –Code of Practice for Bus Body Design and Approval. Clause 2.2.15.3, Clause 2.2.25.1, shall be duly ensured.

31.0 Towing Device

The bus shall have heavy-duty ring type towing devices in the front bumpers area with load transfer to bus structural members. The capacity of each towing

device shall be 1.2 times (minimum) the kerb weight of the bus within 30 degrees of the longitudinal axis of the bus.

32.0 Wind screen – Front and Rear

Windscreen glasses shall meet the requirements of BIS 2553: Part II-1992 or latest and that of CMVR and Bus code. The glazing used for fitment of glasses shall be Ethylene Propylene Dien Monomer (EPDM) rubber of black colour and appropriate adhesive material. Optionally windscreen may be pasted with suitable adhesive. The front windscreen shall be curved, single piece laminated safety glass and provided with demisting feature / system. Rear windscreen shall be single piece toughened flat or curved glass.

33.0 Wind Screen Wipers

The windscreen washing and wiping system shall be in accordance with CMVR/ IS: 7827 Part1, 2, 3 (section 1, 2) or latest.

34.0 Fire Extinguishers

Multipurpose dry powder type (Stored pressure), duly filled fire extinguishers conforming to BIS: 13849-1993 or latest, of capacity and quantity as per the provisions of GSR-853 (E) dated 19.11.2001 notification of Government of India, shall be provided as per the Bus Code. Fire extinguishers shall be encased & fitted with proper reinforcement. The enclosure box shall have transparent breakable glass at front cover.

35.0 First Aid Kit

First aid kit complete with items, medicines, bandages etc. shall be provided as per the provisions of CMVR. The kit shall be fitted near driver seat at appropriate position.

36.0 Persons with Disabilities

The Persons with Disabilities (PWDs) system shall meet the requirements as given in AIS 052(Bus Code) and CMVR. Also, low floor bus should have accessibility to (PWDs) including a suitable wrap around type manually operated wheelchair stabilizing system along with disabled friendly access system at entrance door.

37.0 Bus dimensions

Sr. No.	Description	Low floor Bus
1	Overall length	12000 mm with minus tolerance of 100 mm.

Sr. No.	Description	Low floor Bus
2	Overall width	As per CMVR
3	Overall height	As per CMVR
4	Wheel base	6100 with tolerance of -200 and + 400 mm
5	Ground clearances within the wheel base	Not less than 240 mm
6	Ground clearance at axle	As per CMVR/ Minimum requirement as per Urban Bus Specifications (UBS-II)
7	Floor height at service doors at curb weight	Not more than 400 mm
8	Front overhang	As per CMVR
9	Rear overhang	As per CMVR
10	Turning clearance radius	As per IS-9435 and IS-12222 As per CMVR
11	Ramp over angle	As per IS: 12218
12	Departure Angle	As per IS:12218
13	Approach angle	As per IS:12218
14	Seating capacity	2 x 2 with seating capacity of minimum 34 nos. (excluding driver) and space for one wheelchair with provision for seat belt, wheelchair anchorage No. of standee shall be declared by Vehicle manufacturer based on the floor space available for that purpose. Ref. Bus code AIS 052
15	Gross Vehicle Weight (GVW)	As per CMVR

38.0 24 VDC battery including Charger

- 38.1 The vehicle battery system shall be 24 VDC (nominal) 180 Amps-hour capacity, low maintenance type batteries. The batteries shall be well secured to a hinged/ pivoted or slide out type carrier for ease of access for repair & maintenance, replacement and suitably ventilated for escape of fumes but insulated against ingress of dust and moisture. Performance requirements of the batteries shall conform to BIS: 7372-1995 (or latest) / IS 14257 – 1995 (or latest).
- 38.2 Battery terminals with positive locking system (e.g. angle type terminal with provision for double bolting) duly protected against all possible short circuit risk shall be provided.

- 38.3 Each battery cable shall be covered with flame retardant corrugated flexible pipe and shall be properly encased & clamped.
- 38.4 A heavy-duty battery cut-off switch shall be provided near the driver seat on side panelling at appropriate level for disconnecting the power supply from the battery except for safety devices such as fire suppression system & other systems as specified. The battery cut-off switch with the power plant operating, shall not damage any components of the electrical system in off position. The battery cut-off switch shall be capable of carrying & interrupting the total circuit load.
- 38.5 The bus shall have 24 VDC double pole wiring for all its low voltage electrical equipment except in unavoidable circumstances. A separate system/mechanism shall be provided for the discharge of electro static charge induced during the operation of vehicle. Appropriate precautions shall be taken in case of single pole wiring to avoid spark in sub-assemblies.
- 38.6 A DC/DC converter connected to the high voltage DC-link with an adequate capacity shall be provided for the charging of the 24 VDC-battery.

39.0 24 VDC Electrical equipment and wiring

- 39.1 Electrical equipment and wiring shall be conforming to Indian Standards. All cabling shall be as per the provisions of the Bus code/ safety requirements as provided in CMVR. The wiring shall be flame proof, ISI marked conforming to BIS: 2465-1984 or latest. Wiring shall be grouped, numbered and /or colour coded. Wiring harnesses shall not contain wires of different voltage classes unless all wires within the harness are insulated for the highest voltage present in the wiring harness. Kinking, grounding at multiple points, stretching & exceeding minimum bend radius shall be prevented.
- 39.2 The wiring looms/ harness for vehicle system of the bus shall be properly routed, encased/ concealed type and mounted to eliminate chances of any spark.
- 39.3 All electrical fittings and lights shall be fully wired up, running in flame retardant black colour PVC sleeves as per applicable Indian standards and installed in a manner to facilitate easy inspection/ rectification/ replacement. Wiring should be of multiplexing type with double insulation. The lay out and compliance to standards should be as prescribed in CMVR.
- 39.4 All electrical & electronics hardware shall be accessible & easily replaceable and mounted on an insulating panel to facilitate replacement. The mounting of

the hardware shall not be used to provide the sole source ground and all hardware shall be isolated from potential EMI/ RFI.

- 39.5 All electrical/ electronic hardware mounted in the interior of the bus shall be inaccessible to passengers & hidden from view unless intended to be viewed.
- 39.6 All electrical/ electronic hardware & its mountings shall comply with the shock & vibration requirements.
- 39.7 All branch circuits except battery to starting motor & battery to generator/ alternator circuits shall be protected by circuit breakers or fuses sized to the requirements of the load. Circuit breakers or fuses shall be sized to a minimum of 15% larger than the total circuit load current. The current rating for the wire used for each circuit must exceed the size of the circuit protection being used.
- 39.8 To the extent practicable, wiring shall not be located in environmentally exposed locations under the vehicle. Wiring & electrical equipment necessarily located under the vehicle shall be insulated from water, heat, corrosion & mechanical damage. Where feasible front to rear electrical harnesses should be installed above the window line of the vehicle.
- 39.9 Two separate additional out-lets are to be provided with appropriate relays & fuses in wiring harness for fitment of electrical auxiliary devices/ systems to be added later on in the buses, if required.
- 39.10 Minimum two DC (Direct Current) out-let of 24V will be provided at suitable location for charging of electrical/electronic equipment like Mobile Phone, etc.
- 39.11 If any electronic components have internal clocks, they shall have their own battery back up to monitor time when main battery power is disconnected.
- 39.12 RF components such as global positioning system (GPS) etc. whenever provided shall use coaxial cable to carry the signal. The RF systems require special design consideration for losses along the cable. Connectors shall be minimized, since each connector & crimp has a loss, which will contribute to attenuation of the signal. Cabling should allow for the removal of antennas or attached electronics without removing the installed cable between them.
- 39.13 All electric / electronic systems shall have protection against reverse polarity. Certificate of compliance for reverse polarity to be furnished at the time of prototype approval.

40.0 Conductor Buzzer

An electric buzzer shall be provided in the driver's cab. The buzzer's switch shall be provided near the rear door at an appropriate location for easy operation by the conductor.

41.0 Conspicuity

A retro-reflective tape complying with AIS 90 specifications for conspicuity will be pasted on the vehicle. In front it will be of white colour, on side of the vehicle it will have white or yellow colour and in the rear of the vehicle it will be of red colour. The tape and make has to be type approved.

42.0 Fog Lamps

The bus shall be fitted with fog lamps as prescribed in CMVR.

43.0 Lights, Lighting and Light signalling Systems

43.1 Interior saloon lighting system shall have LED light panel providing minimum light intensity of 50 lux measured at seat level and mounted in two separate circuits in staggered formation for uniform lighting. Wiring should be of multiplexing type with double insulation and fire-retardant type. All lighting to be of LED type only.

43.2 Headlamps fully conforming to CMVR requirements including fitment of head levelling device with relay and side light etc. shall be suitably styled into front-end construction. All lighting and light signalling devices, its fitment and performance shall comply with requirements of CMVR and/or AIS 052 Bus Code.

43.3 White and Red height marker lights shall be fitted at both top side corners of the front and rear panel of the bus respectively.

43.4 Side Indicator, Brake, Reverse & parking light shall be fitted as per CMVR. Side markers shall be provided on both sides as per bus code/ AIS 008

43.5 All the lights, their wattage and lighting systems shall conform to the requirements of Bus code, CMVR and other relevant AIS standards and shall be arranged aesthetically.

43.6 Lights shall be provided for illuminating exit/entrance door area. These lights shall illuminate the outside area up to at least one meter when door/doors is/are opened. The lights for exit/entrance door areas shall be flushed as far as possible. Protrusions (if any) shall conform to relevant CMVR/ AIS Standards.

- 43.7 A well-lighted bus registration number plate shall be fitted at rear as per the provisions of CMVR.
- 43.8 Switches shall be fitted on the right hand side of the instrument panel through evenly loaded circuits & fuses as per the bus code.
- 43.9 A reverse buzzer shall be installed at the rear of the bus to sound intermittently when reverse gear is engaged.

44.0 Provisions for Advertisement Card Holders/Exterior Advertisement Friendly Design

The bus should have a provision for replaceable 'Coving Panels' (PVC panels) for advertisements on both sides of the bus. These panels of suitable size should be insertable in a bracket matching with the bus contours fixed above window frame and below roof sealing. The maximum number of panels as could be accommodated along the length shall be provided.

45.0 Interior Noise and pass by noise

Interior noise shall not be more than 72 Db (A) when tested as per AIS 020 and pass by noise requirements as per CPCB/CMVR when tested as per IS 3028: 1998 or latest rev. Type Approval testing and certificate by the test agency under CMV Rule 126 shall be produced at the time of prototype approval. The pass by noise of the vehicle shall confirm to CMVR requirements when tested as per BIS: 3028:1998.

46.0 Rain simulation testing

All production including prototype buses shall undergo and comply rain simulation test (Shower testing) as per IS; 11865 latest rev.

47.0 EMI and EMC

The fully built bus shall comply with CMVR / AIS 004 (Part 1 and 2). Type Approval testing and certificate by the test agency under CMV Rule 126 shall be produced at the time of prototype approval.

48.0 Electric Horn

An electric horn conforming to BIS: 1884-1993 or latest and installation requirements conforming to AIS 014 shall be fitted in the bus.

49.0 Specifications of Intelligent Transport System (ITS)

The ITS enabled bus with On Bus Intelligent Transport System will have ITS Control Unit, together with bus driver display console. The bus will have Passenger Information System (PIS System) at front, rear, side and internal display board with integrated voice announcement system as per requirements given in Clause 34 above, integrated GPS device for Automatic Vehicle Location System (with compliance of AIS 140 with emergency buttons for access to every passenger in the bus , preferably protected enclosure for switch) and Security Camera Network (CCTVs) with reverse gear and display screen should meet the specification for IP based cameras and mNVR as per Detailed specification document for CCTV devices as per IS 16833:2018 : CCTV system with integrated emergency System or minimum specifications as per Appendix to Schedule 2, whichever is superior shall be complied. The amendments/exemptions shall be intimated as and when received otherwise the bidders have to abide by the BIS standard. The vehicle manufacturer shall use Non-Chinese ITS items in the manufacturing of the buses.

The bus should have 3 (Three) internal and one Reverse Parking camera and Bus Driver Display Screen to telecast the output from each of the camera in a systematic manner, as per the aforementioned specification. The certificate of compliance (Type Approval Certificate) shall be submitted at the time of inspection of prototype from approved test agency under CMVR. In case of said items do not cover Under Type Approval Certification to be issued by Testing Agency as per CMVR, these items be got approved one time from the testing authority as per the specified standards/specifications. The architect to be finalized by the Purchaser at the time of Prototype”.

The other conditions to be complied by the OEM are as given below:

- a) **VEHICLE TRACKING SYSTEM:** To carry out on line vehicle tracking there shall be tracking device (VLT/ ATD) as per system conforming to provisions stipulated in IS 16833:2018 - Annex A with latest Amendments (with compliance of AIS 140 with emergency buttons for access to every passenger in the bus, preferably inbuilt box).
- b) The on-board equipment shall be tamperproof and theft proof.
- c) All the required cables power and signal from battery and device to device shall be laid properly as per the provision of Bus Code for electric cables.
- d) The common minimum requirement of VHMD parameters will be-SOC level, Motor Speed in RPM, Vehicle Speed.
- e) Rear View Camera System to display the zone behind the vehicle shall be provided along with display on or near dash board. The Reverse

Parking Alert System (RPAS) shall comply with provisions of AIS 145. This indirect vision system shall get activated upon engagement of reverse gear. RPAS should give audio warning on reaching the critical distance available for reverse parking.

- f) The main hardware will inter alia include the following:
- i. Front LED Display
 - ii. Rear LED Display
 - iii. Side LED Display
 - iv. Internal LED Display with Integrated/Synchronized Voice Announcement System
 - v. Amplifier, Speakers
 - vi. ITS Controller with Display
 - vii. GPS Device (Automatic Tracking Device) with Emergency Button (s)
 - viii. Power and Communication Harness
 - ix. Bus Driver Display Console 7" TFT- Screen in front of driver (including reverse view)
 - x. Surveillance Cameras (3Nos.), three numbers to monitor bus interiors (doors, driver zone, ticketing zone etc.) and one no. Reverse –Parking Digital Camera.
 - xi. Digital video recorder mNVR) with Hard Disk 1TB -2.5" Solid State Drive (SDD) (Output telecast from each Camera)

50.0 Hammers for breaking window glasses during emergency

Adequate numbers of hammers of suitable design and weight for breaking window glasses during emergency shall be provided and suitably mounted on the interior walls of passenger saloons. Mounting of hammer shall be pilferage-proof.

51.0 Ventilation and Air conditioning (VAC) climate control system:

- (a) The VAC system shall be provided for cooling of the interior whole compartment of the Bus as per the environmental conditions of Delhi.
- (b) The whole bus body shall be thermally insulated with flame retardant Polyurethane or glass wool of minimum 40 kgs/m³ density as per bus code.
- (c) The Air Conditioning System-Specifications and test procedure for type approval will be as under:

Sr. No.	Description	Specifications
1	Specifications	a) For up to 42°C of saloon temperature and b) For > 42°C of saloon temperature
2	Target results	a) 24± 4°C (up to 42°C) b) Temperature gradient of 15° (> 42°C of saloon temperature) e.g. If the saloon temperature is 45°, then the target temperature inside the bus is 45°-15°= 30° c) Minimum average air velocity at air vent is 4.5 m/s
3	Procedure	1. Soak for 1 hour 2. At 2000 rpm 3. Upto 42°C: pull down time 30 minutes (maximum) (for more than 42°C of saloon temperature, pull down time within 40 minutes (maximum)) 4. Thermocouple to be placed over place minimum 20 numbers. at nose level
4	Air Curtains on entry/exit gates to avoid loss/gain of heat and or cool air when doors are frequently opened for boarding/alighting of Passenger with min air flow of 1000±50 m ³ /hr at each gate. Type of air curtains at entry exit gates their power consumption etc be accounted for while deciding engine power, etc	Required
5	Additional requirements	
5.1	Air circulations and ventilation in driver's area	An air passage/duct/roof hatch to be provided in driver area at a suitable location for proper inflow of air inside the driver cab Drivers work area to be provided with blower or suitable device (200 mm diameter fan) to ensure proper ventilation. These devices may be capable of 3 – speed adjustment
5.2	Maximum noise levels inside the saloon	72 dba (maximum)

	(irrespective of AC, non-AC/fuel type/engine location)-test procedure as per AIS 020	
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52.0 Deleted

53.0 Battery Health Status

The Concessionaire must set up an internal system to keep a record of the state of health of the battery measured on parameters as suggested by the battery manufacturer including the range achieved by the battery.

Appendix to schedule 2: SPECIFICATION AND COMPLIANCE OF IP CAMERA

A. Specification and Compliance of IP camera

S. No.	Minimum Specifications
1.	The IP camera should have colour camera (monochrome in night with IR on).
2.	The IP camera shall have fixed, 3.6 mm lens.
3.	The IP camera shall have minimum 2 megapixels, 1920 x 1080 pixels camera resolution.
4.	The IP camera shall have 1/3" CCD or 1/3" CMOS progressive scan image sensor.
5.	The IP camera shall support H.265, H.264, MPEG-4 and M-JPEG Video Compression.
6.	The IP camera shall support G.711 or G.726 Audio Compression.
7.	The IP camera shall support 1 to 25 fps for different resolution.
8.	The IP camera shall have a minimum illumination of 0.01 Lux at F1.2 with IR Off and 0.0 Lux with IR On.
9.	The IP camera shall have shutter time of 1/50 sec to 1/100 000 sec.
10.	The IP camera shall have built-in infrared LEDs with range of minimum 10 m, Auto Day/Night.
11.	The IP camera shall have ruggedness of: a) Rugged, vibration, shock and tamper proof metal housing, and b) Anti-vibration installation with multipoint locking mechanism in horizontal and vertical direction.
12.	The IP camera shall have either built-in microphone or separate microphone

S. No.	Minimum Specifications
13.	The IP camera shall support Image enhancement of auto-tracking white balance (ATW), automatic gain control, wide dynamic range (WDR) and Automatic backlight compensation (BLC).
14.	The IP camera shall receive power from mNVR through power-over-Ethernet.
15.	The IP camera shall support automatic motion detection, Camera Tamper alerts
16.	The IP camera shall support RJ45 10/100 M ethernet interface.
17.	The IP camera support ONVIF Profile S compliant.
18.	The IP camera shall comply to IP66 rating
19.	The IP camera shall support below mention protocols: <ul style="list-style-type: none"> • HTTP; TCP; UDP; NTP
20.	The IP camera shall support below mention streaming methods: <ul style="list-style-type: none"> • Unicast, Multicast

B. Specification and compliance of Mobile NVR

S. No.	Minimum Specifications
1.	The mNVR shall have one video output.
2.	The MNVR shall have four channel video inputs.
3.	The mNVR shall have one audio output.
4.	The mNVR shall have two-way communication (2 nos.) within bus mobility environment to communicate with CCC operator
5.	The mNVR shall support H.265 and H.264 video compression standards.
6.	The mNVR shall support G.711 or G.726 audio compression standards.
7.	The mNVR shall support dual streams, both streams independently configurable for each camera resolution and frame rate.
8.	The mNVR shall support 1080p/ 720p/ 4CIF/ 2CIF/ CIF/ QCIF (can be set independently for each channel, for both streams) recording resolutions.
9.	The mNVR shall support 1 to 25 fps for all channels at 1080p resolution and frame rate can be set independently for each camera, for both streams or vehicle having four CCTV cameras.
10.	The mNVR shall have a minimum of four input (NO/NC) and two output alarm sensors.
11.	The mNVR shall have storage of 1 TB, solid state drive (SSD) with suitable anti-vibration mechanism storage to be pluggable and easily removable, secure and protected by lock for vehicles
12.	The mNVR will record in normal, schedule based, alarm triggered, motion detection mode. Alarms triggered modes may include alarms triggered via digital I/O input, For example, emergency button, emergency door Open, brake on, reversing, mNVR enclosure open.

S. No.	Minimum Specifications
13.	The mNVR will support event based recording and tagging: a) Pre-recording – 1 to 30 min, and b) Post-recording – 1 to 30 min.
14.	The mNVR shall support configurable shut down delay after ignition off – up to 24 h (Configurable in hours and minutes)
15.	The mNVR shall have facility of integrated PoE switch supporting peak power requirement for four CCTV cameras with infrared on and integrated PoE switch supporting peak power requirement for all CCTV cameras within Bus with infrared on.
16.	The mNVR shall have network/communication interfaces as: a) LAN – 1 RJ45 interface (in addition to the camera ports), and b) Wi-Fi – 802.11/b/g/n (optional). c) Built-in 4G/LTE module, supporting both 2G, 3G and 4G/LTE (at least 900, 1800 and 2100 MHz frequency bands), Support for SMS, voice, data (GPRS, TCP/IP) with multiple network OTA switching capabilities.
17.	Support embedded SIM/UICC (As per GSMA guidelines / DoT (TEC) guidelines) to cater to the automotive operational requirement such as vibration, temperature and humidity and provide long life span with at least 10 years life and more than 1 million read/write cycles.
18.	Device shall have built-in/integrated 3 axis accelerometers and 3 axis gyroscopes for accessing driving conditions such as rapid acceleration, sudden braking and hard turn.
19.	System shall have provision of secured data transmission to the backend from the devices through secured channel. Secured channel means encrypted data transmission from device to backend using a secured tunnel on communication medium such as ‘Secured dedicated APN or 2G/3G/4G/LTE network’
20.	It will provide the following additional information: a) GPS data via RS 232/Ethernet to other on-bus devices, and b) Receive route number information from other on-board devices and transmit to back end. It will support transmission mode.
21.	Always –On, turned ‘On’ by: a) Emergency button, or b) SMS or telephone or alerts from I/O.
22.	The mNVR shall have ONVIF profile S compliant.
23.	The mNVR shall support the external interfaces 1 RS232, 1 USB 2.0.
24.	The mNVR have external GSM & GPS antenna.
25.	The mNVR shall have minimum five configurable image settings (one to be the best quality).
26.	The mNVR shall have tamper-proof watermark.
27.	The mNVR video over-written to be configurable to support: A) Cyclic overwriting (oldest recording to be overwritten). b) Event tagged recording not to be overwritten for a longer period (7 to 30days, configurable).

S. No.	Minimum Specifications
28.	The mNVR shall have all input and output connections to be vibration/shock resistant and locking as per BIS (IS 16833) shock and vibration test.
29.	The mNVR shall have LED indicators for power, recording, network.
30.	<p>The mNVR shall be capable of communicating system health parameters over 2G/3G/SMS along with:</p> <ul style="list-style-type: none"> a) Capable of sending health parameters (cameras not-functioning, cameras tamper, storage error, storage full, video loss, camera cover) at specified frequency to the server b) Capable of sending images, video and snapshot (of configurable resolution, (1080p, 720p, 4CIF, CIF, 2CIF, QCIF) from each camera to the server at specified frequency (configurable). c) Capable of detecting failure, error or tamper of cameras or any component and sending alert to server.
31.	The system shall support over the air configuration parameters for mNVR and cameras and over the air upgrade of firmware.
32.	The system shall support independently configuration of motion detection zones for each camera.
33.	The system shall have built in RTC, drift not more than 10s at any time.
34.	The mNVR should provide video and audio download facility for the desired date/time and duration. It should be possible to connect a laptop to mNVR through network cable on RJ45 port and open mNVR' s user interface in a standard browser using a standard URL such as http://dvr with no/minimum configuration requirement of the laptop's network settings.
35.	After entering user-id and password, it will be possible to search, view, select and download video clips of desired duration and date/time in standard formats such as (.avi) or (.mpg). It will not be possible to delete any video or change configuration settings using this set of user-id and password.
36.	<p>The system shall be capable of:</p> <ul style="list-style-type: none"> a) In normal situation, the mNVR will send system health status data and images from cameras to the backend server, at configurable frequency over 4G/LTE network. On press of an emergency button, the mNVR will automatically send the video from cameras to the backend server over 4G/LTE at configurable frame rate and configurable resolution. b) In case the vehicle moves to an area where 4G coverage is not present, the mNVR will automatically shift to 3G/EDGE/GPRS (2G) connectivity to send the system health status data. Also, in such case, on press of an emergency button, the mNVR will automatically shift to a lower frame rate and resolution (both configurable/self-adaptive) and send the video from cameras to the backend server over 3G/ EDGE/GPRS (2G).
37.	<p>The mNVR shall be powered from the battery of the vehicles. The mNVR should be capable of working on a wide range of voltage (say 8 to 32 V), in order to account for the fluctuations of the vehicle battery voltage. Also, it should be possible to have a delayed shut-down after ignition off, so that cameras can keep on recording for a specified period (say 1 h)</p> <p>After ignition switch-off.</p>

S. No.	Minimum Specifications
38.	The system should support any operational GNSS system (Location, speed, heading, time stamp) data polling and capable of sending this data at a frequency shall be 5 s during vehicle operation and not less than 10 min. Device shall be capable for operating in L and/or S band and include support for NAVIC/IRNSS (Indian Regional Navigation Satellite System).
39.	The system shall have feature of location on demand on minimum 3G and configurable backup SMS facility in case of 4G/LTE//3G/GPRS failure.
40.	The system shall have external GPS antenna.
41.	The System shall capable of store minimum 40,000 positional logs.
42.	The system's GNSS module shall have an acquisition equal to or better than (-) 145 dBm with GNSS/ 140 dBm with IRNSS (NAVIC as applicable.)
43.	The system's GNSS module shall have a tracking sensitivity equal to or better than (-) 160 dBm with GNSS/153 dBm with IRNSS (NAVIC as applicable).
44.	The system shall have positional accuracy of less than 6 m 2DRMS (on ground) or 2.5 m CEP (on ground).
45.	The system's GNSS module should have: a) The capability of hot start < 10s b) The capability of warm start < 60s c) The capability of cold start < 120s The above timing shall be applicable after MNVR boots up.
46.	The system should have the A-GPS (Assisted GPS) support.
47.	The system shall have the capability to send serving and adjacent cell ID as well as network measurement report (NMR).
48.	The system shall have the over the air capability as: a) Download of firmware as well as configuration parameters, b) Remote administration and firmware update over the air, and c) Device should be capable of sending a packet to two different IP addresses.
49.	USB 2.0 interface or better
50.	Support (802.11 b/g/n) 2.4 GHz LAN- minimum 10m range
51.	Support easy configuration
52.	Support external SD card for backup
53.	Support data export from mNVR

C. Specification and compliance of Rugged Housing for mNVR

S. No.	Features	Description
1.	Material:	Enclosure: Sheet steel

S. No.	Features	Description
2.	Door:	Sheet steel, all-round foamed-in PU seal
3.	Surface finish:	Enclosure and door: Dipcoat primed, powder-coated on the outside, textured paint
4.	Mounting plate:	Zinc-plated
5.	Dust & water protection	IP 66
6.	IK Code:	IK08
7.	Supply includes:	Enclosure with hinged door(s) with lock mechanism, of all-round solid construction
		Gland plate(s) in enclosure base
		Mounting plate
8.	Material thickness:	Enclosure: 1.38 mm
		Door: 1.75 mm
		Mounting plate: 2.5 mm
9.	General	Suitable for proposed mNVR providing temper proof, shock proof, vibration proof and fire proof enclosure

D. Specification and compliance of Panic Button

S. No	Parameter	Description
1.		The panic buttons will be 'Normally Closed' (NC) type. The form factor of emergency buttons will be such that the button is easy to press in the case of an emergency, and simultaneously also minimizes the possibility of accidental or unintended press thereby causing a false alert.
2.		Emergency button shall be suitable for installation and operation in Bus environment. Terminals for connecting the power and data cables should be suitable to mobility environment to minimize false alerts while maximizing the life of the push button.
3.	Switching frequency	Min. 500 cycle per hour
4.	Mechanical life	Over 1 million operations.
5.	Operating Position	All positions.
6.	Enclosures Material	Cast Aluminium and CRCA Sheet
7.	Degree of protection	IP-66, flame resistant
8.	Casing	The panic button should be provisioned with transparent flap casing to avoid any unintentional activation of panic alerts.

E. Specification and compliance of Display (7")

S. No.	Parameter	Specification
1.	Size	Minimum 7" TFT LCD with arrow keys and number buttons
2.	Luminance	400cd/m2

S. No.	Parameter	Specification
3.	Viewing angle	70/70/50/70 (L/R/U/D)
4.	Resolution	800 × 480 or better
5.	Back-light Type	LED
6.	Video Inputs	Two (compatible with the proposed mNVR)
7.	Functionality	Live view and play back
8.	Power Source	mNVR

Note: Detailed specification document for CCTV devices as per IS 16833:2018: CCTV system with integrated emergency System (AIS 153 as per Amendment 4) or minimum specifications as per Appendix to Schedule 2, whichever is superior shall be complied. However, the requirements under Appendix to Schedule 2 (Table-B, Sr. No. 38 to 47) may be complied together with vehicle tracking system as per IS: 16833, Annexure-A. The amendments/exemptions shall be intimated as and when received otherwise the bidders have to abide by the BIS standard

F. Specification and compliance of Hooter

S. No.	Parameter	Specification	Agreed/ Not Agreed (To be Declared By Bidder)
1.		Hooter with enclosure (IP:66) (1 in each bus) and strobe/flasher (1 in each bus)	

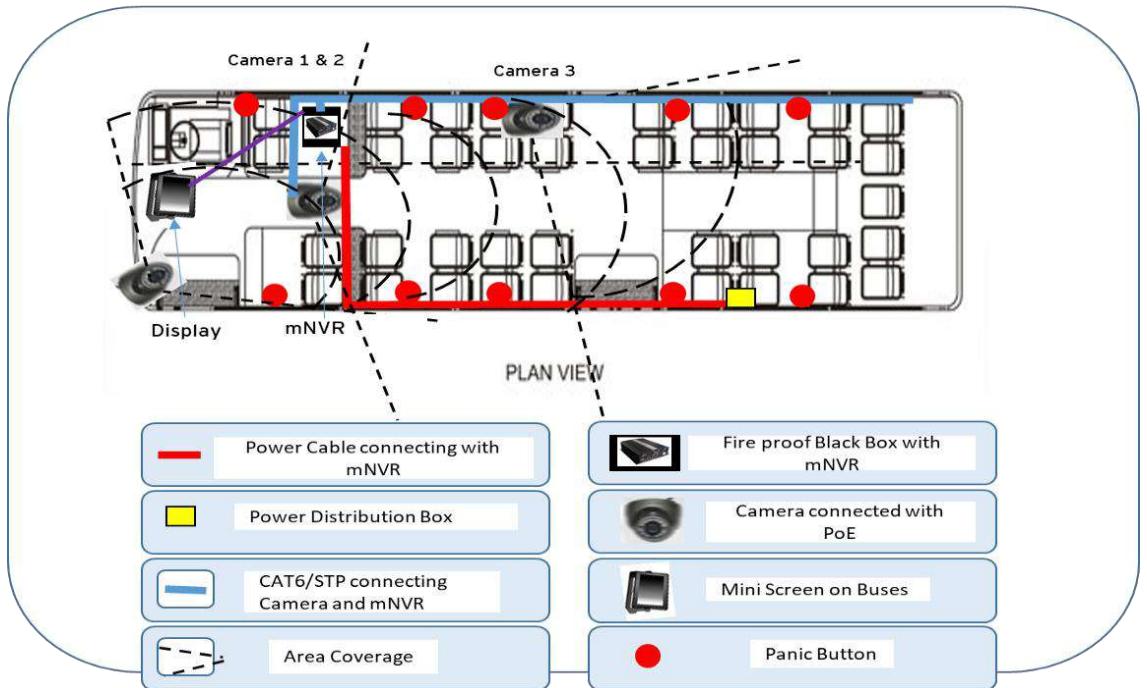
G. Architecture Design

S. No.	Parameter	Specification	Agreed/ Not Agreed (To be Declared By Bidder)
1.	<u>Key design principles</u>	The bidder should adhere to the architectural principles while designing the solution (indicative) as per the details given in annexure 24.	

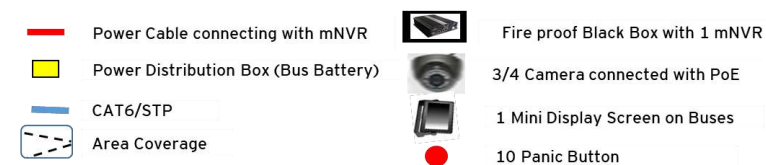
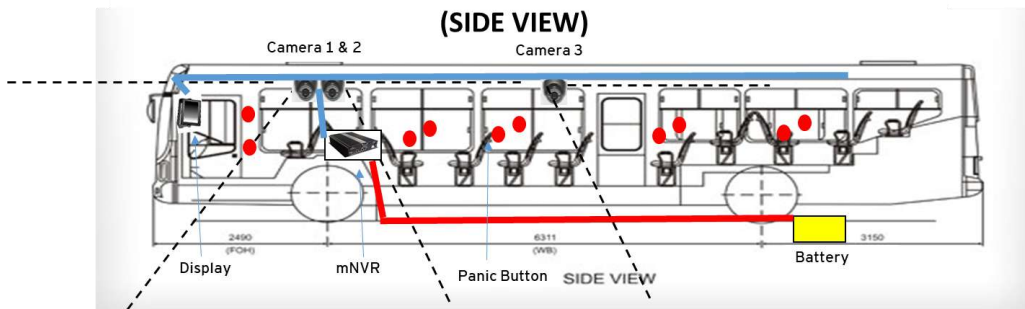
Key design principles

The bidder should adhere to the following architectural principles while designing the solution (in- dicative):

TYPICAL SYSTEM ARCHITECTURE INSIDE THE BUS (TOP VIEW)

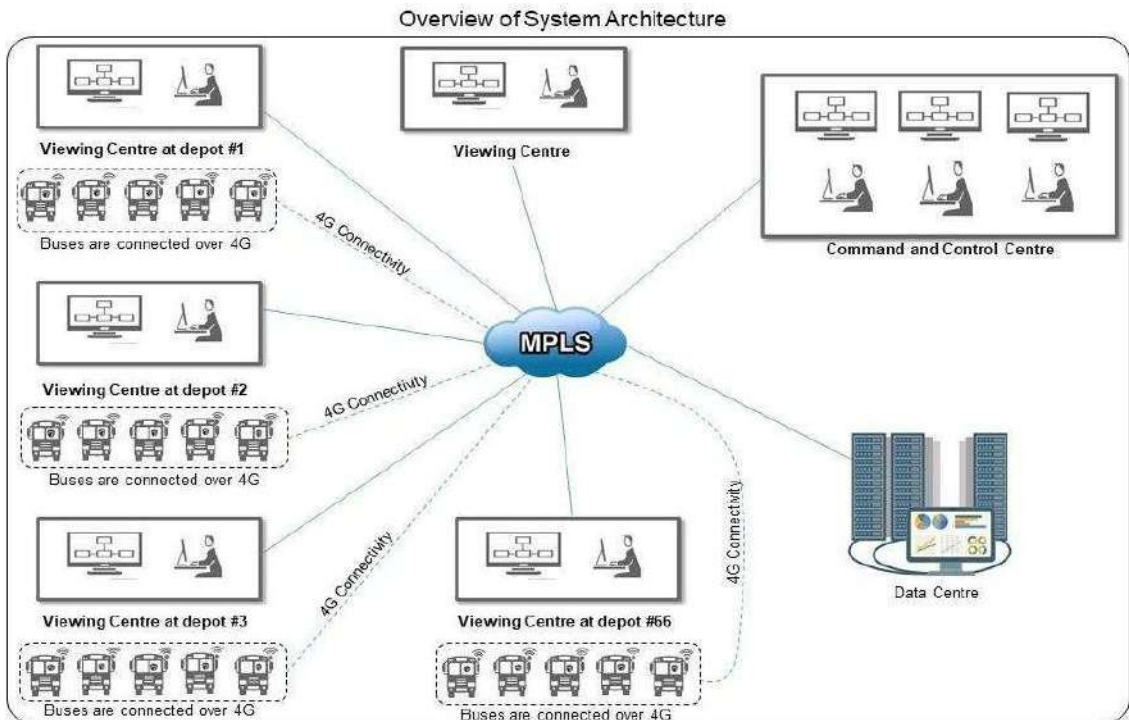


TYPICAL SYSTEM ARCHITECTURE INSIDE THE BUS (SIDE VIEW)



- Cameras will be connected with Mobile NVR over PoE (Power over Ethernet).
- Display Screen for on board viewing
- Panic buttons for emergency alerts
- Alerts will be sent via 4G/3G connectivity to assigned person at respective Depot and CCC
- Recording - 7 days (ONBOARD), Event based storage (DC) for 6 months, Flagged incident/event based for 12 months

- i. Placement of camera, display screen, panic with strove cum hooter and power supply design is depicted in the above two diagrams. All the cameras will be connected with Mobile NVR over POE (Power over Ethernet) and feed from these camera is fed to display screen near driver seat. Panic buttons, strobe & hooter for emergency alerts are placed near the driver, ticket collector and women passenger seats. Alerts will be sent via 4G/ LTE connectivity to assign person at respective master data centre and CCC.



Note: Detailed specification document for CCTV devices as per IS 16833:2018 : CCTV system with an inbuilt tracking system and integrated emergency System or minimum specifications as per Appendix to Schedule 2, whichever is superior shall be complied. The amendments/exemptions shall be intimated as and when received otherwise the bidders have to abide by the BIS standard.

XXXXXXX

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Operational Parameters, Monitoring And Performance Adjustments

SCHEDULE 3

1. Operational Parameters

This schedule defines operational parameters and standards that direct the Concessionaire to provide required services to bus passengers of Delhi and the NCR **with Pure Electric Buses**.

1.1. Aims and Objectives

The principle aim of this performance monitoring regime is to provide greater incentives for a safer, more reliable, attractive, economic and efficient bus service to passengers.

Passengers value the quality of bus service on the following performance parameters:

- Service reliability and frequency
- Less crowded buses
- Journey time
- Affordability
- Passenger comfort
- Accessibility to bus stops

Other service quality parameters that are considered important in assessing the performance of the bus network include:

- Staff attitude and behavior
- Personal safety and security during the journey
- Ease of accessing vehicles
- Cleanliness
- Vehicle repair
- Easy availability of travel information

The performance of the Concessionaire shall conform to the expected service level standards as elaborated in the following paragraphs.

1.2. Definitions – For the purpose of this schedule:

- 1.2.1. “Advertisement Panels” means the designated space reserved in the interior and exterior of the bus to display advertisements.

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- 1.2.2. “Applicable Limit” means the permissible limit in timetable for the purpose of operation of Stage Carriage Buses as described in Schedule 3.
- 1.2.3. “Automated Vehicle Location System (AVL)” means the GPS-based automatic vehicle tracking system, integrated online with central server. The GPS data will have integration with GIS map for fleet management.
- 1.2.4. “Central Data Base” means the data centre for storing and retrieving operational data, established by IM or any agency appointed by IM.
- 1.2.5. “Contactless Smart Card” means the smart card (ISO 14443 compliant) authorized by IM or its nominated service provider which can be validated by the smart card readers cum validators installed on board in the buses for e-transfer of actual fare data on the system by IM or its nominated service provider.
- 1.2.6. “Data Suspension” means suspension of unrepresentative data as a result of factors outside the Concessionaire’s control over short term time periods (defined with mutual agreement) on the request of the Concessionaire, which will not be used by IM to assess the Concessionaire performance.
- 1.2.7. “Delayed Trip” means any trip operated in which deviation in actual time of operation from the start point is more than the permissible tolerance limit as is described in Schedule 3.
- 1.2.8. "Deductible Lost Kilometerage" means the total number of Scheduled Kilometers (other than Non-Deductible Lost Mileage) determined in the reasonable opinion of IM as having not been operated in any Payment Period.
- 1.2.9. “Driver Quality Monitoring” means a point-based monitoring system to assess the standards of driving maintained in the provision of the services. The system assigns points on various performance parameters as described in Schedule 3.
- 1.2.10. “Electronic Ticketing Machines (ETMs)” means the machines provided by IM in the buses to issue paper tickets and validate tickets for the purpose of fare collection.
- 1.2.11. "Emergency Ticket Pack" means a sealed pack of serially numbered, fully pre-printed tickets, issued to the Concessionaire, for use when the Ticketing Equipment supplied by IM or its nominated service provider is not available for use in the operation of the Services.
- 1.2.12. “Fatal Accidents” means accident involving private stage carriage bus operating under this contract in which there is a death of passengers/road users.
- 1.2.13. “Incident Management” means a system developed by the Concessionaire to report and make relief and support system to deal with in service breakdowns, accidents and other incidents as described in Schedule 3.

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- 1.2.14. “Lost Kilometerage” means the total number of Scheduled Kilometers in Service Kms left uncompleted due to any missed Trip or Trip not completed as described in Schedule 3.
- 1.2.15. “Major Accidents” means accident involving private stage carriage bus operating under the supervision of IM which may involve hospitalization or estimated damage of above Rs. 25,000.
- 1.2.16. “Minor Accidents” means accident involving private stage carriage bus operating under this contract with extent of estimated damage of bus upto Rs. 25,000 and/or simple injuries to passenger / third party, requiring only outdoor medical care.
- 1.2.17. “Missed Trips” means any trip which does not cover the scheduled trip length (kilometerage) between origin and destination. The trip which is either not operated or is missed due to breakdowns etc. will also be covered under the category of missed trips.
- 1.2.18. “Non-Deductible Lost Kilometerage” means the total number of Scheduled Kilometers in Service Kilometers not operated by the Concessionaire the loss of which is determined in the reasonable opinion of IM as being beyond the Concessionaire’s reasonable control in accordance with the provisions of Schedule 3. This will be taken into consideration only for the purpose of calculation of deductions of penalty amount in terms of Clause 3.3.1 of Schedule 3 of the RFQP document.
- 1.2.19. “On-board Equipment” means all types of on-board equipment (excluding which are part of standard fitment) in the bus including but not limited to smart card validators installed by IM or its nominated agency.
- 1.2.20. “Operational Control Centre” means a communication, analysis and operational control hub established and maintained by the Integrated Mechanism to control, manage and monitor the bus operation. The OCC will access data through AVL, AFCS, Concessionaire reports, field data inputs etc., and will provide MIS reports for operational and managerial purposes.
- 1.2.21. “Retention Period” means the safe custody of operational and revenue data in the custody of the Concessionaire with proper backup for the period as defined in Schedule 3.
- 1.2.22. **“State of Charge (SOC)” means percentage of charge of on-board Battery Bank in a electric bus. For e.g. State of Charge (SOC) of 50% means, that a battery bank is half full.**
- 1.2.23. “Ticketing Equipments” means any equipment and/or software and/or associated infrastructures provided in the bus in accordance with the provisions of this Concession Agreement for use in the provision of the Services primarily for the purposes of issuing tickets and recording of the same, recording on bus revenue receipts, validating Smartcards, recording

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passenger journeys and for the provision of information to the Concessionaire and to IM or its service providers relating to the same.

1.3. Applicable Clearances / Approvals

- 1.3.1. Obtaining the necessary and Applicable Clearances / Approvals and meeting their requirements, including but not limited to the Certificate of Fitness (CoF), **the certificate on EMC-compatibility, the certificate on insulation test, any other necessary certificate related to high voltage propulsion system**, the Third-Party Insurance Policy, and Proof of Road Tax Payment.

1.4. Engineering Quality

- 1.4.1. Providing **electric buses** that meet the technical specifications provided in Schedule 2 and further up keeping and maintaining buses to ensure their roadworthiness that meet the requirements of Stage Carriage Services. The preventive maintenance regime as prescribed by the Vehicle Manufacturer (VM) shall be carried out as per the schedule. The record of all preventive maintenance activities shall be kept in the Bus Maintenance Log Book (Log Book) and duly authenticated by the person in charge of the vehicle workshop carrying out bus maintenance. The Log books shall be produced for inspection by officials of Transport Department, GNCTD / IM as and when demanded.
- 1.4.2. If, IM considers that the operation of a vehicle provided by the Concessionaire could affect the safety of passengers or the general public, IM may instruct the Concessionaire not to operate that vehicle. In such circumstances the Concessionaire shall provide at its own expense an alternative vehicle for the performance of the Services.
- 1.4.3. The other provisions like disinfection of buses in once in two months as per Clause (73) of DMVR 1993 shall also be complied with by the Concessionaire.

1.5. Operational Staff

The Concessionaire shall be responsible for:

- 1.5.1. Ensuring that the duty hours of deployed staff are in compliance with The Motor Transport Workers Act, 1961.
- 1.5.2. Ensuring adequate operational staff to meet the requirement of the prescribed schedules. The operational staff deployed shall fulfill statutory requirements as per the Motor Vehicle Act, 1988 or any other applicable law as amended from time to time. Furthermore, only drivers registered with IM or a nominated agency of IM shall be deployed.

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1.5.3. Deploying operational staff in proper uniform (as prescribed in the DMVR/Permit conditions from time to time) with nameplate. Operations staff of the Concessionaire on board the bus shall be responsible for the custody of the complaint/ suggestion book and first aid kit.

1.5.4. Ensuring compliance with Qualifications, Duties and Responsibilities of Drivers as defined in **Annexure A**. IM / GNCTD reserves the right to develop and maintain a biometric record of operational staff of the Concessionaire for the purpose of monitoring.

1.6. Driver Quality Monitoring (DQM)

1.6.1. IM may introduce a point-based monitoring system for drivers. The monitoring system may include assigning points on various performance parameters including but not limited to:

- Accidents
- Complaints;
- Rash driving, including not stopping or inadequate stoppage at designated bus stops (less than 30 seconds and start off before passengers are seated/ securely standing);
- Tampering with On-board Equipments such as equipment related to GPS, AFCS and CCTV;
- Allowing passengers to travel without tickets;
- Violating rules related to smoking, or talking on a mobile phone or driving under influence of drugs or alcohol.

1.6.2. Details of such a point system shall be worked out during the operation period. In case the negative points for a driver exceed certain pre-defined values in a specified period, IM may issue directions to the Concessionaire not to deploy the concerned driver on service for a period ranging from three days to permanent disqualification. This period must be utilized by the Concessionaire for imparting refresher training to such driver. **See Annexure B for more detail.**

1.7. Minimum Service Obligation

The Concessionaire shall be responsible for ensuring that:

1.7.1. stage-carriage operation of buses as per the UTT as notified by the State Transport Authority (STA), and compliance to the Motor Vehicles Act, 1988 and any other rules/guidelines notified from time to time;

1.7.2. buses report for operation at the route starting point a minimum of five minutes prior to the first start time. Buses must be in a clean, presentable

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condition and in a state of mechanical roadworthiness as set out in **Annexure C**;

- 1.7.3. prescribed routes are adhered to and every scheduled journey is completed as planned. Concessionaires should note that changes to routes and incomplete journeys, are liable for penalization except under force majeure circumstances as set out in Concession Agreement;
- 1.7.4. buses stop at designated bus stops with clearance at the entry point of the bus to allow for easy boarding and egress;
- 1.7.5. appropriate usage of appliances like the disabled access ramp to ensure proper boarding and alighting of passengers at bus stops;
- 1.7.6. buses stay at the stop until all passengers who need to alight have done so, and all passengers waiting at the stop for the bus have boarded;
- 1.7.7. passengers are not allowed to board or alight at unauthorized locations.

1.8. Systems development and reporting responsibilities

1.8.1. As part of the contract the Concessionaire must develop systems for collecting, recording and sharing information and data as listed below.

1.8.2. Lost Kilometerage

The Concessionaire must put in place a system to capture daily operational data at source level and communicate the same to the OCC of IM as per details in Section 'Lost Kilometerage' and **Annexure D**. The system will need to be operational at least 15 days before the start of the service under the contract.

If, the Concessionaire is found to have failed to declare or has inaccurately declared Missed Kilometerage / Deductible Lost Kilometerage, IM shall be entitled to make Deductions for all the Deductible Lost Kilometerage undeclared or wrongly declared (as measured against any final determination in respect of Deductible Lost Kilometerage made under Schedule 3) in question.

1.8.3. Bus Maintenance program

The Concessionaire must set up an internal system to keep a record of all maintenance activities carried out on the buses. The system shall maintain a record of total kilometerage performed by the buses on a daily basis, including revenue and non-revenue kilometers. The system shall be capable of monitoring maintenance activities with respect to the preventive maintenance schedules prescribed by the Vehicle Manufacturers. The Concessionaire shall send a report to the IM's Operational Control Centre (OCC) through electronic

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means on a daily basis, comprising details of Bus Maintenance Data as per **Annexure E**.

1.8.4. Energy charged per vehicle

The Concessionaire must set up an internal system to keep a record of charged energy per vehicle per day. The reference-point shall be the charged energy measured at a charger.

1.8.5. Total energy demand

The Concessionaire shall be responsible for putting in place a system of measuring the total energy demand for charging of buses per day. The reference point shall be the charged energy measured at the grid connection point.

1.8.6. Incident management

The Concessionaire shall be responsible for putting in place a system of reporting by the driver and other support staff as regards breakdowns, accidents and other incidents. As part of the incident management process the system should include:

- Information regarding any damage to vehicle **including insufficient energy at the traction energy storage,**
- Involvement of any third parties.
- The bus route number,
- The vehicle number
- Crew details
- The time of the incident

The Concessionaire is also responsible for putting in place a system for the quick retrieval and recovery of vehicles and, to remove any road obstructions caused as a result of the incident. Please refer to **Annexure F** for further information.

The Concessionaire shall also ensure that backup buses are available in reserve to ensure service continuity in case a bus is held up due to accidents or to cover any unforeseen eventualities like breakdown repairs.

1.8.7. Lost property

The Concessionaire shall be responsible to comply provisions as contained in Clause (70) of DMVR 1993 regarding handling of lost property articles detected during operation of the Stage Carriage Buses. Also, the Concessionaire shall follow any further guidelines on this subject to be issued by DoT/IM without prejudice to any statutory guidelines for handling and disposal of lost property article.

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1.9. On-board Equipment and Advertisement Panels

The Concessionaire shall be responsible for:

- 1.9.1. **Ensuring that On-board Equipment such ITS equipment as a part of standard fitment in the buses like PIS Display Boards, Internal Voice announcement System, GPS device, CCTV Cameras are in working order and not tampered with when bus is pressed into service in each service trip.** The safety and security of such Equipment provided on the bus shall be the responsibility of the Concessionaire. Daily operational data in the required format needs to be uploaded on the OCC system by the concessionaire. IM may, as needed, audit and perform sample checks of operational data and equipment.
- 1.9.2. Ensuring that other On-board Equipment such as ticket issuing equipment, Smart Card Validators, cabling, and accessories provided by IM or an agency nominated by IM, are in working order and not tampered with. The safety and security of On-board Equipment provided on the bus shall be the responsibility of the Concessionaire. Daily operational data in the required format needs to be uploaded on the OCC system by the concessionaire.
- 1.9.3. Making buses available for fitment / inspection / periodic maintenance of On-board Equipment to an agency nominated by IM at regular bus parking places. The inspection/periodic maintenance will normally be carried out during the night shift when the bus is not in service. In circumstances when inspections are carried out during the day, IM will make every effort to ensure that this does not interfere with the Concessionaire's service obligations. The Concessionaire will develop and implement an effective maintenance system to ensure the timely repair of equipment through the service provider.
- 1.9.4. Making buses available for fitment/ removal of advertisements, at the time decided through mutual convenience with IM or any other agency authorized by IM.

1.10. Ticketing and revenue collection

The Concessionaire must ensure that

- 1.10.1. The conductor or driver, (in case a conductor is not deployed in the bus), shall issue proper tickets against the fare collected, in the services operated in the Cluster. DoT/ IM reserves the right to deploy conductors in buses in service either in the scope of the Concessionaire or subject to payment on mutually agreed rates of incremental cost to the Concessionaire. **See Annexure G for more details.**

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1.10.2. All revenues shall be handed over to IM or deposited in a designated account in accordance with this agreement for Basic Services and Additional Services.

1.10.3. Emergency Ticket Packs will be made available for each bus in service by the IM or its authorized agency. The Concessionaire shall follow the following procedure for the same: -

- i. On commencement of duty the conductor (driver in case no conductor is provided as per the agreement) will be issued with an **Emergency Ticket Pack** which will bear a uniquely identifying serial number and other security measures as specified from time to time.
- ii. In the event of the Ticket Machine/ Smart Card Validator becoming inoperable while the bus is in service, the Emergency Ticket pack will be opened and these tickets will be issued in lieu of tickets from the ticket machine/ Smart Card Validator. Each Emergency Ticket Pack ticket is individually numbered and denotes a monetary value. Tickets may be issued in multiples of any combination up to the exact fare.
- iii. The Emergency Ticket Pack contains a waybill which must be completed in full showing details of the tickets issued. At the end of the conductor's shift the Emergency Ticket Pack (complete with unused tickets) and the way bill shall be handed in by the conductor to the depot cashier along with cash collection.
- iv. The Concessionaire shall check the completion of the waybill and shall return all part used Emergency Ticket Packs and the accompanying waybills to IM, on the Friday of each week.
- v. The used Emergency Ticket pack will be replaced by IM or, where notified, its contractor or agent with a new Emergency Ticket Pack.
- vi. All revenue collected or received by the Concessionaire as a result of the use of Emergency Ticket Packs shall be paid to IM or deposited in a designated account by the Concessionaire in accordance with the above procedure on weekly basis.

1.11. Right of Access

1.11.1. DoT / IM shall have the rights of access and the rights of audit and/or inspection set out in the Concession Agreement.

1.11.2. The Concessionaire shall provide or make available to DoT / IM:

- i. all assistance as may reasonably be required;
- ii. all records, data and other information as may reasonably be required;
- iii. the use of a telephone, photocopier and where available facsimile machine;
and
- iv. a suitable work area

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1.12. Retention of Data

The Concessionaire shall be responsible to retain all records (which shall mean all records relating to or in connection with the Agreement and any other information reasonably required by IM or specified in the Agreement) for a period of not less than five years after expiry or termination of the Concession Agreement (the “Retention Period”). IM shall have the rights of access and the rights of audit and/or inspection of any or all such records in accordance with the provisions set out.

2. Performance Monitoring

2.1. IM proposes to set up a comprehensive OCC for the monitoring of Operations and key Performance Standards.

2.2. Information Formats

IM OCC will need to be fed with information and data to measure and evaluate service performance. It will be necessary for the Concessionaire to put in place a system to capture basic Operational Data at the source level and / or Parameters that need to be captured should include but not be restricted to those in **Annexure C** – (List of operational parameters).

The Concessionaire shall maintain proper records and provide any information asked by IM. This data would be over and above the scheduled reports as defined in Annexure D. Basic data capture shall be through automated means as far as possible.

The Concessionaire shall communicate the operational data to the OCC through electronic means on daily basis in Microsoft Excel compatible format or as specified from time to time, which shall include, inter alia, details as per **Annexure D**. IM will require further information on a monthly basis based on formats set out in **Annexure E and H**.

2.3. Immediate Reports Related to Accidents

The Concessionaire will provide immediate notification of an accident, followed by a written report within 24 hours to the IM’s OCC. The written report will provide all relevant information as specified in **Annexure F**, Immediate notification and a written report must be provided as and when the Concessionaire becomes aware of any event resulting from the Services or associated activities which involves:

- loss of life of any passenger, member of the Concessionaire’s staff, or other person; or

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- an injury to any passenger, or other person where medical attention was required immediately in the wake of the accident.
- robberies or assaults on passengers or staff
- vandalism and public disorder both on and off vehicles or in the garage or depot where the incident involves:
 - a. safety critical bus failures
 - b. insufficient electric energy at the traction energy storage which led to the untimely end of service**
 - c. any incident of a like nature that is likely to attract media attention
- acts of vandalism affecting service delivery
- incidents (including environmental incidents where prosecution is likely, or there is (or there is likely to be significant media attention.

When notifying IM of the incident, the Concessionaire will provide the following information as set out in “Incident Report Form” with details including:

- the date, time and place of the incident;
- the circumstances of the incident;
- particulars of injury to any passenger or other person requiring medical attention (if known);
- particulars of damage to the Vehicle;
- the name and identification number of the Concessionaire’s staff present at the time of the incident;
- **the SOC at which service has been untimely ended;**
- name, address and contact telephone number of any persons involved (if known), and
- name, address and contact telephone number of any witnesses (Identification number, if the witness is a staff member).
- route number and bus registration number.

The Concessionaire may be required to submit additional incident investigation reports as requested by IM.

2.4. Immediate Reports Related to Potential Disruptions to Service

The Concessionaire will provide immediate notification followed by a written report providing all relevant information to the IM’s OCC as soon as the Concessionaire is aware of any event (including proposed industrial action) that is likely to substantially disrupt or alter the delivery of Services. The Concessionaire must identify the likely effect of this event and the steps to be taken by the Concessionaire to minimize the disruption to Services.

2.5. Weekly Reporting of Other Incidents

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The Concessionaire shall provide OCC with information for other incidents in relation to each week ('week' being Saturday to Friday). This information shall be provided to IM on or before the Thursday after the end of each week in which the incident took place or at other such intervals as IM may require from time to time.

3. Performance Measurement

3.1. In order to assess the Concessionaire's performance in meeting its service obligations as set out in Para 1 of Schedule 3, IM will measure specific operational parameters as set out in the following paragraphs. Each measureable parameter will enable IM to reward or penalize the Concessionaire depending on its performance against a pre-determined benchmark.

A. Performance Deductions

- Delayed Trips
- Missed Trips
- Other Infractions

B. Performance Incentive

- On-time benchmark
- Sample Check on specified performance parameters and Incentives

3.1.1. Performance Deductions and Incentives shall be adjusted for CPI on bi-annual basis. IM's decision with regard to the above assessments shall be final.

3.1.2. Without prejudice to the Deductions set out in the preceding clauses, DoT / IM reserve the right to pursue other remedies as defined in the Agreement. Such Deductions also do not constitute a waiver of any other remedies applicable under Law.

3.1.3. CYF payable for a Trip shall be calculated for AC Services as set out below :

$$= [(Capital Charge \div 365 days) \div No. of trips for the day for the specific Route] \\ + [No. of kms for the Trip \times Consumables Charges per service kilometer] \\ + [No. of Hours for the Trip \\ \times Manpower and Overhead Charges per service hour]$$

The aforesaid shall be used for such purposes as may be required including for calculating the deduction for Missed Trip in para 3.3.1 and for deduction as set out in para 3.7.

3.2. Performance Deduction for Delayed Trips and Performance Incentive for Better than Benchmark Performance

The provision of reliable services is a very high priority for bus passengers. Therefore, subject to exceptional circumstances, when trip delays are unavoidable, the Concessionaire is required to ensure that the UTT is adhered to, with no cancellations and all buses operating on time.

- 3.2.1. Departure times or service intervals, as appropriate, shall be published at bus stops and elsewhere by IM; and
- 3.2.2. A delayed Trip is defined as any departure of a bus outside specified time limits set out in the table below.
- 3.2.3. The performance of each Concessionaire in the cluster will be worked out by comparing the actual observed departure times with the specified departure times as set out in the UTT. A bus will be regarded as ‘on time’ if it departs from a scheduled departure point within the Applicable Limits from UTT.

S. No.	Description (Checkpoint/s)	Applicable Limits from UTT	
		Earliest Start	Latest Start
1	Start of First Trip for Each Bus for the day	+ 0 minutes	+ 2 minutes
2	Start of Each Subsequent Trip	+ 2 minutes	+ 5 minutes
3	First checkpoint en-route at about ~ 5 km	- 2 minutes	+ 5 minutes
4	Second checkpoint en-route at about ~ 10 km	- 2 minutes	+ 8 minutes
5	Third checkpoint en-route at about ~ 15 km and all subsequent checkpoints, if any	- 2 minutes	+ 10 minutes

- 3.2.4. The Concessionaire’s performance of the Services shall be monitored on a monthly basis against these punctuality benchmark standards.
- 3.2.5. The Concessionaire will be financially rewarded for services performing above the benchmark (Tables 1 and 3), and penalized for services performing below the benchmark (Tables 1 and 2).
- 3.2.6. IM will measure the performance of all buses in a cluster on a monthly basis using AVL system. The actual online performance of each bus will be measured against the On Time Performance Benchmark.

Table 1 – Online Time Performance

S. No.	Category and Performance	Below Benchmark	Above Benchmark
1	On Time Performance Benchmark “BM” : 88% - 92%		

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S. No.	Category and Performance	Below Benchmark		Above Benchmark	
			% of total monthly checkpoints for the Cluster	Less than BM	Deduction: On-time Deductions in terms of Table 2.

At the end of each month IM will collate performance results in order to calculate the overall performance incentive payment or debit for the Concessionaire. Tables 2 and 3 set out the method of calculation of deduction and incentive for each bus operated in the cluster.

Once the total number of deductions and incentives are added together, IM will issue a summary performance table to the Concessionaire. This will be issued no later than 25 working days after the month in which performance has been measured. The report will include:

- All routes details, including any agreed changes to the route detail
- Start and end dates of the month
- Confirmation of any agreed data suspension for a previous month and notification of any applications for data suspension being considered by IM at that time

The summary table will set out the percentage of buses operating ‘on time’ compared to the departure times specified in the UTT and the reward or penalty due.

Table 2 - Deductions for Not Achieving On Time Performance Benchmark

S. No.	Performance	Prorated Deduction
1	Upto 5% below BM of 88%	Rs. 75/ - for each checkpoint
2	Upto 10% below BM of 88%	Rs. 115/ - for each checkpoint
3	Upto 15% below BM of 88%	Rs. 150/ - for each checkpoint
4	More than 15% below BM of 88%	Rs. 190/ - for each checkpoint

Table 3 - Incentive for Actual Performance Better than On Time Performance Benchmark

S. No.	Performance	Prorated Incentive
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1	Above the BM of 92%	Rs. 300/-for each checkpoint
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3.2.7. IM reserves the right to prepare other reports for the purposes of monitoring the Services and reporting the performance of the Services to key stakeholders.

3.3. Lost Kilometerage

3.3.1. For any missed Trip or Trip not completed, deductions shall be made in the following manner:

S. No.	Extent to which a Trip is missed	Deduction
1	A Trip, which either does not commence or does not complete even 25% of the kilometers for the Trip.	150% of the CYF (including payment towards Capital, Consumables and Manpower/ Overhead Charges) payable for the Trip, in terms of Clause 3.1.3, will be applied as performance deductions for the Trip. In addition, the CYF for the lost kilometerage of the trip, in terms of Schedule 5, shall not be payable.
2	A Trip, which has completed more than 25% but less than 60% of the kilometers for the Trip.	100% of the CYF (including payment towards Capital, Consumables and Manpower/ Overhead Charges) payable for the Trip, in terms of Clause 3.1.3, will be applied as performance deductions for the Trip. In addition, the CYF for the lost kilometerage of the trip, in terms of Schedule 5, shall not be payable.
3	A Trip, which has completed more than 60% but has not completed 100% kilometers for the Trip.	50% of the CYF (including payment towards Capital, Consumables and Manpower/ Overhead Charges) payable for the Trip, in terms of Clause 3.1.3, will be applied as performance deductions for the Trip. In addition, the CYF for the lost kilometerage of the trip, in terms of Schedule 5, shall not be payable.

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IM will use an AVL device for the purposes of assessing the kilometerage performance of each of the services operated under this schedule. Operated kilometerage must also be reported by the Concessionaire on a monthly basis. The information will be set out under the headings listed below:

- Name of Concessionaire and kilometerage code
- Route to which the information relates
- Week ending date to which information relates
- Daily scheduled in service kilometerage derived from the working timetable
- Any agreed additional Kilometers
- Any agreed curtailed Kilometers
- Kilometers to be operated
- Lost kilometerage which the Concessionaire accepts is Deductible Lost Kilometerage categorized as follows:
 - Staff (s)
 - Mechanical (m)
 - **Insufficient energy reserve at the traction energy storage**
 - Other deductibles (od)
- Lost kilometerage which the Concessionaire claims is Non-Deductible Lost Kilometerage categorized as follows:
 - Traffic
 - Other non-deductibles (ond)
- Operated in service kilometerage for the week
- Percentage of Kilometers operated
- Any extra Kilometers operated

3.3.2. Deductible and Non-Deductible Lost Kilometerage

In exceptional circumstances, where the Concessionaire can demonstrate to IM and DoT that lost kilometerage was out of the control of the Concessionaire and the Trip was missed due to peculiar traffic conditions, rains, rallies, police action not specific to the Concessionaire, IM may waive the deductions. A classification of possible ‘lost kilometerage’ causes is set out in **Annexure I**. The Concessionaire would need to classify ‘lost kilometerage’ according to whether it is ‘deductible’ and therefore deemed to be within the control of the Concessionaire or ‘non-deductible’, caused by factors outside the Concessionaire’s control.

IM will determine the extent to which it is reasonable that none or only some of the lost kilometerage which is claimed to be non-deductible by the Concessionaire is Non-Deductible Lost Kilometerage. Such determination will be made on the grounds that the Concessionaire has failed to take all reasonable steps to overcome, avoid or minimize the effects of any events beyond its reasonable control.

3.4. Other Infractions

3.4.1. An Incidence of sub-optimal performance and/or non-compliance of Specifications and standards shall be referred to as an “Infraction”. The deduction for each Infraction shall be made in terms of the table set out below:

S. No.	Category of Infraction	Reference Table for Infraction in Annexure J	Amount for Each Infraction for calculating Performance Claim/ Deduction (in Rupees)	Time to Resolve for next higher slab in terms of Clause 3.3.4 of this Schedule (Bus related infraction)
1	A	Table 3.A	120/-	One day
2	B	Table 3.B	450/-	Two days
3	C	Table 3.C	1,200/-	Three Days
4	D	Table 3.D	1,875/-	Three Days
5	E	Table 3.E	3,750/-	One day
6	F	Table 3.F	Defined in Table 3.F	One day

Note: Performance Deduction/Claim amount shall be applied even during time to resolve the infraction (Period indicated as in above table).

3.4.2. Infractions can be identified by IM, a nominated person or agency based on visual checking, electro-mechanical reviews, reports from independent agencies and data from the Central Data Base of IM. IM shall have access to Concessionaire’s facilities in order to check such Infractions on a regular basis either through visits to the workshops and garages commonly used by the Concessionaire, or bus inspections at terminal points along the route during service hours.

3.4.3. The Concessionaire may note that the formats provided in Annexure C, D, E and H are typical, but are subject to revision from time to time based on actual information, logistics and monitoring requirements.

3.4.4. In case of non-rectification of infraction within stipulated time to resolve, any subsequent repetition shall attract penalty of next higher slab with a ceiling of Rs. 3,750 per infraction. Thereafter, it will be binding on the Concessionaire not to operate the vehicle till rectification of the bus related infractions.

3.5. Accidents

3.5.1. Sanctions on Concessionaire Operating Staff

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Based on information gathered through Driver Quality Monitoring, Engineering Quality Monitoring and Mystery Traveler audits IM reserves the right to impose specific sanctions by way of temporary suspension of operating staff of the Concessionaire. The length of suspension will be based on the type and severity of mis-conduct. The sanction could be for a maximum duration of up to the end of Concession Period.

3.5.2. Major or Fatal Accident Situations

In case of major or fatal accidents and collisions the Concessionaire shall additionally undertake the following activities:

- (a) Direct the concerned driver to undergo a refresher course and pass a skills test in IDTR or any other institute(s) prescribed by IM.
- (b) Undergo another medical checkup for eye sight conducted by a medical board authorized by IM.
- (c) In the case of mechanical failure or a failure at the high-voltage system, re-certification of the bus for road worthiness based on a mechanical/ electrical inspection by an authorized agency and provide proof thereof to IM.
- (d) In addition to the above measures, IM shall impose a cash penalty of Rs. 1,00,000 (Rupees One Lakh) per fatality, in case of an accident involving a fatality. This penalty amount shall be adjusted for CPI-IW bi-annually. This financial penalty will be without prejudice to any other legal action against the Concessionaire taken by a court of law.

3.6. Other Issues Related to Monitoring

IM will manage operations with suitable software including inputs from global positioning system (GPS) or any other appropriate system. A GPS system can track speed and collect other data. Upon request of bodies such as GNCTD/ DoT / State Transport Authority/ Traffic Police etc., IM may be obliged to share information with them related to over-speeding, accidents, etc. based on data collected at the Central Data Base of IM. The Concessionaire may note that these agencies may decide to impose fines and penalties on their own based on applicable Laws.

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Annexure A

QUALIFICATIONS, DUTIES AND RESPONSIBILITIES OF DRIVERS AND CONDUCTORS

A. Drivers

The Concessionaire shall ensure that the drivers deployed by him meet the qualifications and perform duties and obligations, as laid down hereunder.

1. Qualifications of Drivers

- (i) Academic qualifications for the drivers shall be minimum 10 + 2 class pass or as applicable by law.
- (ii) Drivers shall possess a valid HTV driving license and PSV badge valid in the NCT of Delhi.
- (iii) Drivers should have a good level of overall fitness so as to be able to walk, stand and sit while on duty.
- (iv) Drivers should be in prescribed uniform during their shift and badges should be worn at all times.
- (v) Drivers should be trained to operate on board equipment installed on the bus.
- (vi) The other requirement for drivers will be same as that laid down in the Motor Vehicle Act (MVA) 1988, Delhi Motor Vehicles Rules (DMVR) 1993 and STA, Delhi.

2. Duties and Responsibilities of Drivers

2.1 The Concessionaire shall ensure that deployed drivers shall, as a part of their duties and responsibilities:

- (i) shall perform a pre-trip inspection of the assigned vehicle;
- (ii) shall behave in a civil and orderly manner with passengers, prospective passengers and all other road users;
- (iii) shall be dressed in clean and specified uniform as prescribed in Permit Conditions for Private Stage Carriage Bus operation or as notified by STA, Delhi;
- (iv) shall maintain the vehicle in a clean and hygienic condition;
- (v) shall take all reasonable precautions to ensure that passengers are not endangered or unduly inconvenienced by the presence of luggage or freight, where luggage and freight is carried on vehicles in addition to passengers.

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- (vi) shall, where goods are carried on the vehicle in addition to the passengers, take all reasonable precautions to endure that passengers are not endangered or unduly inconvenienced by the presence of the goods;
- (vii) in the event of bus being unable to proceed to its destination on account of mechanical breakdown or other causes beyond the control of the driver, arrange to convey passengers to their destination in some other similar vehicle.
- (viii) shall take all reasonable steps to facilitate inspection of bus, etc conducted by authorized officials of IM.
- (ix) shall, on demand by any Police Officer, officer of the Transport Department, or any member of the State Transport Authority produce their identity card, display his/her license or badge for inspection.
- (x) shall strictly adhere to the notified time table for arrival and departure of the vehicle from authorized depots and bus stands for the convenience of passengers.

The Concessionaire shall ensure that the drivers in no case shall:

- (i) interfere with persons boarding or preparing to board other vehicles.
- (ii) willfully deceive or refuse to inform any passenger the correct fare for their journey.
- (iii) except for a good and sufficient reason, refuse to carry any person tendering the legal fare.
- (iv) except for good and sufficient reasons require any person who has paid the legal fare to alight from the vehicle before the conclusion of his/her full journey.
- (v) loiter, or unduly delay any journey. The driver shall proceed to the scheduled destination in accordance with the time table pertaining to the trip.
- (vi) cause or allow anything to be placed in the vehicle in such a manner as to obstruct the entry or exit of passengers.
- (vii) act as a tout or agent of any commercial establishment.
- (viii) allow anybody to sit next to him/her, or distract his/her attention whilst driving.

B. Conductors

The qualification, duties, functions, conduct of conductors shall be governed by DMVR 1993, read with permit conditions.

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Annexure B

MONITORING OF DRIVING STANDARDS

1. Introduction

The Driver Quality Monitoring (DQM) is an objective assessment of the standards of driving maintained in the provision of the Services. DQM will be undertaken by a third party professional contractor (the DQM Contractor) appointed by IM or its authorized agency, on behalf of DOT.

2. Monitoring Objectives

- 2.1. The objectives of DQM are to:
 - 2.1.1 enhance the safety and comfort of passengers using the Services;
 - 2.1.2 enhance the safety of members of the public and other road users by reducing accident rates;
 - 2.1.3 demonstrate clear commitment to continuous improvement in driving standards on the Services with robust data;
 - 2.1.4 provide objective professional appraisals that enable the Concessionaire to target its own activities to improve driving standards;
 - 2.1.5 address concerns regarding the standard of driving provided in the provision of the Services raised through public correspondence and ongoing monitoring and surveys carried out by IM.

3. Methodology

- 3.1. DQM Assessors will not make themselves known to the driver and are not empowered to suspend or instruct drivers they regard as exhibiting serious faults. DQM Assessors will pay the appropriate cash fare or show a pass appropriate for their journey.

4. DQM Assessments

- 4.1. DQM Assessments may be undertaken by IM or its authorized agency where:
 - 4.1.1. a particular route or the Concessionaire fail to meet IM's required standards, as specified from time to time; and
 - 4.1.2. public correspondence and/or any other source available to IM suggests that the Services are not meeting IM's required standards, as specified from time to time.
- 4.2. DQM Assessments may be conducted at anytime.

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5. DQM Assessments – Aspects Covered and Standards

- 5.1. The DQM Assessors are expected to make qualified, impartial and consistent judgment of the standard of driving experienced over a number of journeys.
- 5.2. The DQM Assessments are carried out under normal driving conditions and not test conditions. Each DQM Assessment will take a minimum of 20 minutes. A copy of the assessment form is attached at Appendix 1.
- 5.3. DQM Assessors will mark the standards of driving in terms of the following aspects:
 - 5.3.1. aspects of driving to be assessed:
 - smoothness of acceleration, braking and steering;
 - care in the use of speed;
 - speed on approach and into bus stops (and other appropriate bus infrastructure);
 - speed through hazards and bends;
 - negotiation of roundabouts, traffic lights;
 - position on road and lane discipline;
 - signaling and use of mirrors;
 - positioning at bus stops (and other appropriate bus infrastructure); and
 - distance between bus and other vehicles (moving and stationary).
 - 5.3.2. external aspects to be noted:
 - apparent condition (obvious problems which would make the driver's job harder);
 - prevailing light conditions (night / low winter sun, wet road, water-logged road etc.); and
 - weather conditions.
- 5.4. An overall DQM Assessment will be given using the following codes and definitions:
 - 5.4.1. **Code 1:** Fully Acceptable Drive. A journey on the bus that would be perceived by a passenger as being comfortable with no unexpected sudden movements.
 - 5.4.2. **Code 2:** Acceptable Drive with Minor Faults. A journey where mistakes are made and passenger comfort is being eroded. The mistakes made are generally minor ones, which can be rectified through improved application of existing skills and/or driver training.

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5.4.3. **Code 3A:** Unacceptable Drive with a Significant Fault. A journey where a mistake was made that could lead to an accident and/or which would cause a significant level of passenger discomfort. Otherwise the drive is acceptable.

5.4.4. **Code 3B:** Unacceptable Drive with Serious and/or Repeated Faults. A journey where the mistakes made are serious enough to have a high level of accident potential and passenger comfort is being severely compromised.

5.4.5. **Code 4:** Unacceptable Drive with Dangerous Faults. A journey where passengers' or other road users/members of the public, lives are being put at risk as a result of the driver's actions.

6. Serious Incident Procedure

6.1. Where the bus driver is considered to be under the influence of alcohol or drugs, the DQM agency nominated by IM will be required to report the salient details immediately to IM's OCC who shall then contact the Concessionaire to request immediate action. The Concessionaire shall take steps to implement such action immediately. A full report of the incident will be emailed to the Concessionaire within 24 hours of the DQM Assessment being carried out.

7. Driver Training and Uniform:

- (a) The Concessionaire shall ensure that each driver should undergo at least three (3) days of training in each calendar year. The data for the same should be maintained using biometric system.
- (b) Drivers and Office Staff Uniforms: The Concessionaire shall give at least 2 sets of uniforms to drivers and office staff in each year. The proof of the same shall be submitted to DoT and IM. Failure to provide uniforms would invite penalty as mentioned in this Schedule.

Revisit	
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Date	<input style="width: 95%;" type="text"/>	Destination	<input style="width: 95%;" type="text"/>
Time On	<input style="width: 95%;" type="text"/>	Time Off	<input style="width: 95%;" type="text"/>
From	<input style="width: 95%;" type="text"/>	Bus Reg. No.	<input style="width: 95%;" type="text"/>
To	<input style="width: 95%;" type="text"/>	Concessionaire	<input style="width: 95%;" type="text"/>
Route No.	<input style="width: 95%;" type="text"/>	Weather	<input style="width: 95%;" type="text"/>

Stopping – smoothly	<input style="width: 95%;" type="text"/>	Move off – safely	<input style="width: 95%;" type="text"/>
Stopping – position	<input style="width: 95%;" type="text"/>	Move off – control	<input style="width: 95%;" type="text"/>
Door operation	<input style="width: 95%;" type="text"/>	Use of all mirrors (MSM)	<input style="width: 95%;" type="text"/>
Moving off – timing	<input style="width: 95%;" type="text"/>	Give signals	<input style="width: 95%;" type="text"/>
Moving off – smoothly	<input style="width: 95%;" type="text"/>	Reaction to signals	<input style="width: 95%;" type="text"/>
Comfort – braking	<input style="width: 95%;" type="text"/>	Stopping safely	<input style="width: 95%;" type="text"/>
Comfort – acceleration	<input style="width: 95%;" type="text"/>	Lane discipline	<input style="width: 95%;" type="text"/>
Comfort – cornering	<input style="width: 95%;" type="text"/>	Road position	<input style="width: 95%;" type="text"/>
Anticipation	<input style="width: 95%;" type="text"/>	Roundabouts	<input style="width: 95%;" type="text"/>
Safety	<input style="width: 95%;" type="text"/>	Keep distance	<input style="width: 95%;" type="text"/>
Customer service	<input style="width: 95%;" type="text"/>	Adequate clearance	<input style="width: 95%;" type="text"/>
Dress	<input style="width: 95%;" type="text"/>	Use of speed	<input style="width: 95%;" type="text"/>

Overall assessment

Code 1 = Fully acceptable	Code 3A = Unacceptable with significant faults
Code 2 = Acceptable with minor faults	Code 3B = Unacceptable with serious/repeated faults
	Code 4 = Unacceptable with dangerous faults

Passenger volume

Busy	<input style="width: 95%;" type="text"/>	Average	<input style="width: 95%;" type="text"/>	Quiet	<input style="width: 95%;" type="text"/>
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Traffic conditions

Busy	<input style="width: 95%;" type="text"/>	Average	<input style="width: 95%;" type="text"/>	Quiet	<input style="width: 95%;" type="text"/>
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Passenger comment

Driving comments

DAILY CHECK LIST OF EACH BUS IN A CLUSTER

S.No.	Bus No.	Time	Exterior Clean/ Washed	Interior Swept/ Cleaned	Exterior & Interior lights in working order	No Visible dent(s) / scratch (more than 6 inches)	All safety glasses intact	All ITS equipment in working order	No unauthorized posters pasted on bus inside or outside
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

List of operational parameters

- **Driving Quality:**
 - Driving speed
 - Stoppage at a bus-stop
 - Distance between bus and curb at bus-stop
 - Non-scheduled stoppages (coupled with door opening)
 - Violations of traffic rules (lane driving, jumping signals, over-speeding)
- **Bus Frequency**

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- Average/max and min duration between the arrival of two buses at the stops of high- frequency routes
- Time of departure of the first trip from starting point of the route.
- Expected Vs. actual arrival/departure times at and from the first and stipulated bus-stops respectively for low frequency bus routes
- **Kilometerage Information**
 - Number of completed and incomplete journeys
- **Journey Experience**
 - Route taken (deviation from standard)
 - Journey duration
 - Number travelled in that journey,
 - Average , max, min boarders, de-boarders per stop en route
- **Miscellaneous Details:**
 - Ticketing options used – split between the modes (AFC, ETM, Emergency failover system)

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Annexure D

Daily Bus Operation Data

Cluster no.:

Concessionaire code:

Date :

S. No.	Route No.	Duty No.	Bus No.	Driver No.	Trips			Kilometers				No. of Service Hours	No. of trip operated late (outside tolerance limits)	Details of Breakdown if any (Time, Type Code)	Details of accident if any (Time, Type Code)	Remarks, If Any
					Scheduled	Operated	Missed	Scheduled	Operated	Missed	Non-deductible, if Any with details					
(1)	(2)	(3)	(4)	(5)	(6)			(7)				(8)	(9)	(10)	(11)	(12)

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Annexure E

Bus Maintenance Data

S. No.	Bus No.	Maintenance due on (Kms)	Maintenance carried out on (Kms)	Whether carried out at authorized service centre	Entry No. in Bus Maintenance log book
(1)	(2)	(4)	(5)	(6)	(7)

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Annexure F

OPERATIONAL GUIDELINES

1. Incident Reporting

1.1. Incident Reporting

IM as an integrated mechanism needs to maintain the records of all incidents, which will be used for monitoring and investigation purposes. The Concessionaire will need to maintain the data of all incidents including these:

- Resulting in damage to the bus, third party vehicles or inanimate objects;
- Causing injury to bus passengers, bus crew or members of the public (including assaults) or animate objects; or
- Which could be considered to have safety implications (such as mechanical or electrical failure, fire, wheel loss etc.); and
- Traffic accidents and vandalism.

1.2. Immediate Reporting of Serious Incidents

1.2.1. The Concessionaire shall inform OCC of IM immediately on telephone, online bus communication system or any other available mode of communication, any of the following in so far as they relate to the provision of the Services:

- All incidents resulting in a fatality, or major injury or requiring medical attention;
- Robberies and assaults on passengers or staff;
- Low bridge/flyover strikes or other limited headroom obstructions;
- Fire on vehicles;
- Collisions resulting in any injury;
- Vandalism and public disorder (both on and off service vehicles);
- Safety critical bus failures (including wheel loss, brake failure or power surge); and
- Any incident of a like nature or that is likely to attract media attention.

1.2.2. The Concessionaire shall send information immediately to OCC after an event referred to in above Para has taken place, with the following information:

- Route number;
- Date, time and location of incident;
- Bus Registration No;
- A brief description of the incident;

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- Details of any injuries sustained;
- Details of Police Case; and
- Any other information that may be required from time to time.

1.2.3. The Incident Report Form must be completed and submitted to OCC at the earliest opportunity.

1.2.4. The Concessionaire may be required to submit additional incident investigation reports as required by IM.

1.3. Weekly Reporting of Other Incidents

A full report for “other” incidents; i.e. those that do not fall under the definition of “serious” incidents, shall be reported as soon as is practically possible having regard to the reporting requirement as given above.

2. Standard Guidelines for attending & dealing with on-the-Road Accidents/Incidents Involving Buses, Passengers &/or Staff

2.1. Introduction

This section defines the respective responsibilities of the Concessionaire and IM in responding to and dealing with on-the-road accidents and other incidents actually involving buses, passengers and staff, and the effects of such accidents/incidents.

2.2. It is the primary responsibility of the Concessionaire, their staff and officials, to deal with the actual incidents. The Concessionaire must ensure that there are adequate resources and/or training of their own staff, in order that they can deal with these incidents including obtaining and reporting information to meet both the Concessionaire’s and IM’s requirements.

2.3. The Concessionaire needs to ensure that appropriate action is taken to minimise the effects on passengers, the Services and any other services operated under contract with or by Concession Agreement of IM. This includes arranging the transfer of passengers to any other suitable alternative Buses.

2.4. The Concessionaire should fill the Incident Report Form and submit it to OCC at the earliest.

2.5. The Concessionaire should not give interviews or comments to the media. If specifically asked for comments on the incident, the Concessionaire will refer the enquiry to the IM.

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INCIDENT REPORT FORM

SECTION A (USE SEPARATE SHEET FOR ADDITIONAL INFORMATION OR CONTINUE OVERLEAF)

Concessionaire: _____	Depot: _____
Route Number: _____	Bus Registration NO: _____
Nature of Incident: _____ (Major/Minor/Fatality)	
Date of Incident: _____	Time of Incident: _____
Location (including Road/Junction/Postcode): _____	

Details of Persons Injured:		
Include Name and Address/Age Sex/Injury	Address:	Contact No. if available
_____	_____	_____
_____	_____	_____

Brief Details of Incident:

Damage Description:
Include All Vehicles/Infrastructure Involved

Signature _____	No: _____	Date: _____	TIME: _____
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SECTION B (USE SEPARATE SHEET FOR ADDITIONAL INFORMATION OR CONTINUE OVERLEAF)

Time Arrived at Scene:
Destination of bus: _____ Travelling From: _____ To: _____
Estimated Speed: _____ Fleet Number: _____ Hospital Used: _____
Driver Name: _____ PSV Badge: _____
Conductor Name: _____ Badge no: _____
In the vicinity of: pedestrian crossing/traffic lights/passenger queue/stopping place/mini roundabout/other road junction/bus lane
Police Station Jurisdiction: _____ Did Police Witness Incident?: _____ FIR NO if applicable _____
Details of Other Witnesses: _____ contact no. if available _____

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Annexure G

TICKETING AND TICKETING EQUIPMENT

1. Introduction

IM is planning to implement an Automatic Fare Collection System (AFCS) on all stage carriage buses in Delhi. In the proposed AFCS, commuters will use Contactless Smart Cards for payment of fare in buses. In addition, for non-Smart Card holder passengers, there will be other ticketing options, which may include Electronic Ticketing Machines (ETMs). IM shall select an agency (ies) to supply, install, maintain and operate the AFCS System (“Service Provider for AFC System”). After selection of AFCS Provider, detailed guidelines and operating procedures will be formulated with respect to AFCS and intimated to the Concessionaire.

IM shall arrange to supply the Concessionaire with the ticketing equipment which may include the following, for the use by the Concessionaire in operating the services (“Ticketing Equipment”). IM shall determine the quantities of each item of equipment that will be supplied from time to time.

Item	Main Function
Electronic Ticket Machine (ETM)	For issuing tickets against cash
ETM Charger	For charging the ETM on bus
Smart Card Validator (SCV)	Required to validate Smart Cards on bus.
Drivers Module	For collecting the transaction data and transferring fare table and configuration data
Depot Computer (with Printer and UPS)	To store and transmit data between the equipment on the buses and the central system.
Communication Module	For transfer of data between buses and Depot computer
Smart Card	Contactless Smart Card

2. Ticketing Equipment and Emergency Ticket Packs

2.1. IM or its nominated service provider shall supply to the Concessionaire such Ticketing Equipment and Emergency Ticket Packs in such volumes and of such type as IM in its reasonable opinion considers necessary for the Concessionaire to operate the services. The Ticketing Equipment and Emergency Ticket Packs shall remain the

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property of IM and the Concessionaire shall not in any way act or refrain from acting in any way which may impair or affect IM' or its nominated service provider (as the case may be) access to such Ticketing Equipment and/or Emergency Ticket Packs.

- 2.2. The type of Ticketing Equipment and/or Emergency Ticket Packs supplied pursuant to Para 2.1 may change from time to time and the Concessionaire shall co-operate fully with IM and its nominated service provider in respect of the introduction of any new types of Ticketing Equipment and/or Emergency Ticket Packs.
- 2.3. IM shall arrange to install the Ticketing Equipment in buses and issue, or arrange for the issue of other Ticketing Equipment and Emergency Ticket Packs at a location named by the Concessionaire.
- 2.4. The Concessionaire shall not without the prior written consent of IM use the Ticketing Equipment or the Emergency Ticket Packs for any purposes other than for the provision of bus passenger transport services on behalf of and under contract to IM.
- 2.5. The Concessionaire shall not without the prior written consent of IM use other types of ticket issuing and/or pass recording equipment for the purposes of operating the services or for any purposes associated therewith.
- 2.6. The Concessionaire shall, in no case, remove or tamper with the Ticketing Equipment installed on buses and Depots.
- 2.7. Except as otherwise specifically authorized, all installation, removal and maintenance of the Ticketing Equipment shall be undertaken by IM or its service provider and subject to provision of Para 2.17 shall be undertaken at IM's expense. The Concessionaire shall permit IM or its nominated service provider, access to the Concessionaire's vehicles at all reasonable times for the purposes of installation or removal of Ticketing Equipment and for the purposes of servicing, maintenance or repair of Ticketing Equipment.
- 2.8. The Concessionaire shall permit IM or its nominated service provider to do such works as are necessary to carry out the installation on or removal of Ticketing Equipment from the Concessionaire's vehicles. IM shall ensure that all such works shall be done with reasonable skill and care.
- 2.9. The Concessionaire shall ensure that Ticketing Equipment is made available to IM or its nominated service provider for the purposes of servicing, maintenance or repair as and when required by IM or requested by the Concessionaire.
- 2.10. All vehicles used in the operation of the services shall be fitted with the Ticketing Equipment provided pursuant to Para 2.1.
- 2.11. In case, the Concessionaire intends to withdraw any vehicle from the operation, the Concessionaire shall apply to IM, a minimum of 1 (one) week prior to the date of withdrawal, for removal of any Ticketing Equipment from such vehicle.
- 2.12. The Concessionaire shall be responsible for the safe-keeping of the Ticketing Equipment and Emergency Ticket Packs unless they are in the possession of IM or its

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nominated service provider (not being the Concessionaire) and any costs incurred or revenue potentially lost as a result of loss or misuse of the Ticketing Equipment and/or Emergency Ticket Packs shall be paid to IM by the Concessionaire.

- 2.13. The Concessionaire shall operate the Ticketing Equipment and take such steps as are necessary to keep it in good working order in accordance with instructions and procedures issued by IM or its nominated service provider to the Concessionaire from time to time.
- 2.14. The Concessionaire shall make use of the Emergency Ticket Packs in accordance with the provisions of Para 6.0.
- 2.15. In case any Ticketing Equipment which is lost or damaged by reason of the Concessionaire, its employees, contractors or agents:
 - 2.15.1. carrying out any modification, adjustment, repair or maintenance of the Ticketing Equipment without the prior written consent of IM;
 - 2.15.2. tampering or interfering with or applying any attachments to the Ticketing Equipment which have not been authorised by IM;
 - 2.15.3. failing to install the parts of the Ticketing Equipment for which it has responsibility for installation in a proper and careful manner;
 - 2.15.4. failing to look after or to keep the Ticketing Equipment securely;
 - 2.15.5. failing to use the ticket rolls and/or other material supplied by IM, in the manner prescribed by IM from time to time;
 - 2.15.6. subjecting the Ticketing Equipment to unusual physical or electrical stress; or
 - 2.15.7. failing to exercise due skill and care in handling the Ticketing Equipment or neglecting or misusing the Ticketing Equipment

The same shall be repaired or replaced at the expense of the Concessionaire or, if IM requires, the Concessionaire shall pay to IM a sum equal to the full replacement value of such Ticketing Equipment.
- 2.16. Upon expiry or termination of the Concession Agreement, the Concessionaire shall immediately return all Ticketing Equipment and Emergency Ticket Packs supplied hereunder to IM. If the Concessionaire fails to return the Ticketing Equipment and/or Emergency Ticket Packs, IM or its nominated service provider shall have the right to enter the Concessionaire's premises and vehicles to recover the same. The Concessionaire shall pay to IM a sum equal to the full replacement value of any such Ticketing Equipment not returned to or recovered by IM and, in the case of Emergency Ticket Packs a sum equal to the total value of the contents of the same as if the Emergency Ticket Pack had not been opened and no tickets issued from it in respect of any Emergency Ticket Pack not returned to or recovered by IM.

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3. Ticket Rolls and Other Material

- 3.1. IM or its nominated service provider shall supply to the Concessionaire ticket rolls and other material (viz. consumables, spares), as may be required to operate/use Ticketing Equipment, in such volumes and of such type and at such frequencies as IM in its reasonable opinion considers necessary for the Concessionaire to operate the services.
- 3.2. The Concessionaire shall not without the prior written consent of IM use the ticket rolls and/or other material supplied pursuant to Para 3.1 for any purposes other than for the provision of the services.
- 3.3. The Concessionaire shall not use the ticket rolls and/or other material other than those provided by IM or its nominated service provider for the purposes of operating the services.
- 3.4. The Concessionaire shall be responsible for the safekeeping of the ticket rolls and other material unless they are in the possession of IM or its nominated service provider (not being the Concessionaire) and any costs incurred as a result of loss or misuse of the ticket rolls or other material shall be paid to IM by the Concessionaire.
- 3.5. Upon expiry or termination of the Concession Agreement the Concessionaire shall immediately return all unused ticket rolls and other material supplied hereunder to IM. If the Concessionaire fails to return the ticket rolls and/or other material, IM shall have the right to enter the Concessionaire's premises to recover the same. The Concessionaire shall pay to IM a sum equal to the full replacement value of any such ticket rolls and/or other material not returned to or recovered by IM.

4. Information and Data from Ticketing Equipment

- 4.1. The Concessionaire shall provide and make available to IM or its nominated service provider all passenger journeys, revenue receipts, ticket issued and other data in agreed electronic formats.
- 4.2. The Concessionaire shall provide to IM any such information in respect of passenger journey, revenue receipts and ticket issue as IM may reasonably require from time to time.
- 4.3. IM shall have the rights to audit revenue data and the rights associated therewith.

5. Rights of Access to and Audit of Revenue Data

- 5.1. The Concessionaire shall maintain systems which accurately record and control the Concessionaire's handling of fares revenue and payment of the same to IM, Ticketing Equipment, Emergency Ticket Packs and any other equipment or items provided by IM or its nominated service provider to the Concessionaire for the provision of the services as follows:

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- 5.1.1. the Concessionaire's allocation of Ticketing Equipment and Emergency Ticket Packs to vehicles and/or staff;
- 5.1.2. the location of Ticketing Equipment and Emergency Ticket Packs and other items provided by IM or its nominated service provider;
- 5.1.3. duties worked against receipts paid in by duty;
- 5.1.4. ticket sales information to cash paid in reports;
- 5.1.5. the Concessionaire's procedure for dealing with paying in irregularities (e.g., more or less cash being paid in that is being accounted for on the Ticketing Equipment); and
- 5.1.6. the Concessionaire's procedure for ensuring that all on-bus fares revenue collected on the services is paid to IM

and shall undertake regular checks of these systems in order to test their effectiveness and put in place such measures as are necessary to eliminate any shortfalls in these areas.

- 5.2. The Concessionaire shall provide to IM details, as required, (including full documentation) of the systems adopted in accordance with the requirements of Para 5.1 and any other data security procedures adopted by the Concessionaire to maintain accurate and reliable records of sales information. IM shall have the right to audit all such systems.
- 5.3. The Concessionaire shall at its own expense comply with any reasonable recommendations of IM in relation to amendment or implementation of procedures relating to the above.
- 5.4. The Concessionaire shall keep all records relating to revenue including a receipt for each duty operated or in the absence of this a ticket machine waybill for each duty operated for a minimum of 6 (six) months, all data from the Ticketing Equipment for a minimum of 12 (twelve) months, all accounting records for the period of 5 years, provided that if data, records or information shall fall into more than one of the aforementioned categories such data, records or information shall be kept for the longer period indicated.
- 5.5. IM shall have a right of access, on giving reasonable notice, to the Concessionaire's premises in order to exercise the rights of audit set out in Para 5.1 and 5.2 and in order to inspect fares revenue receipt information, Ticketing Equipment, Emergency Ticket Packs and any other equipment or item provided by IM or its nominated service provider to the Concessionaire and any other accounting records or supporting information kept by the Concessionaire relating to the provision of the services.
- 5.6. IM shall have the right to take copies of such records and information referred to in Para 5.1 as are necessary in connection with any audit carried out pursuant to Para 5.1 and 5.2. The Concessionaire shall allow copies to be taken on its copying equipment at no cost to IM.

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5.7. In the case of Ticketing Equipment, Emergency Ticket Packs and any other equipment or items provided by IM or its nominated service provider to the Concessionaire, IM reserves the right to instruct the Concessionaire to carry out its own audit of this equipment and items in such form as IM may reasonably request and provide the results of such audit to IM.

6. Fare Collection Arrangements and Ticket Checking

6.1. The Concessionaire shall ensure that its drivers and other staff as appropriate carry out and comply with the following procedures (as amended from time to time by IM).

6.2. Emergency Ticket Packs

6.2.1. The Concessionaire shall ensure that on commencement of duty the driver will have issued to him/her an Emergency Ticket Pack which bears a uniquely identifying serial number.

6.2.2. In the event of the ticket machine becoming inoperable during the duty the Emergency Ticket Pack will be opened and the tickets issued in lieu of tickets from the ticket machine. Each Emergency Ticket Pack ticket is individually numbered and denotes a value.

6.2.3. The Emergency Ticket Pack will contain a waybill which must be completed in full showing details of the tickets issued and at the end of the duty the Emergency Ticket Pack (complete with unused tickets) and the waybill shall be handed in by the driver at the Depot.

6.2.4. The Concessionaire shall check the completion of the waybill and shall return all part used Emergency Ticket Packs and the accompanying waybills to IM, or where notified to its contractors or agents each week.

6.2.5. The used Emergency Ticket Pack will be replaced by IM or where notified its contractor or agent with a uniquely serial numbered new Emergency Ticket Pack.

6.2.6. All monies collected or received by the Concessionaire as a result of the use of Emergency Ticket Packs shall be paid to IM by the Concessionaire.

7. Re-issued Tickets

7.1. Under no circumstances, whatsoever, used or withdrawn tickets may be re-issued. Drivers must not have used tickets in their possession at any time.

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Annexure H

LIST OF STATUTORY CERTIFICATIONS

Cluster no.:

Concessionaire code:

Date :

S. No.	Bus No.	COF			EMC-compatibility Test			Insulation Test			Insurance Details				Road Tax Details
		Certificate No.	Date of Issue	Valid upto	Certificate No.	Date of Issue	Valid upto	Certificate No.	Date of Issue	Valid upto	Policy No.	Date of Issue	Type	Valid Upto	Receipt No. Date Validity Month
(1)	(2)	(3)			(4)			(5)			(6)				(7)

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Annexure I

LOST KILOMETERAGE CLASSIFICATION & CAUSES - DEDUCTIBLE AND NON-DEDUCTIBLE

1. Staff (Deductible)

- 1.1. In service kilometerage not operated due to staff causes may include (but is not limited to):
 - 1.1.1. Insufficient staff to cover the service including shortage, sickness or absence, industrial action etc.
 - 1.1.2. Sickness on duty (part loss).
 - 1.1.3. Suspension of driver or conductor (without replacement).

2. Mechanical (Deductible)

- 2.1. In service kilometerage not operated due to mechanical **or electrical** causes may include (but is not limited to):
 - 2.1.1. Insufficient buses to cover the service.
 - 2.1.2. Non-serviceable bus with adequate SOC of Battery Bank.
 - 2.1.3. Breakdowns en-route.

3. Other Deductible

- 3.1. In service kilometerage not operated due to something over which the Concessionaire has an element of control but which is not covered by staff or mechanical causes may include (but is not limited to):
 - 3.1.1. Staff error or unauthorised curtailments by staff.
 - 3.1.2. A bus blocked in the garage and unable to depart on time.
 - 3.1.3. **A bus running out of State of Charge of on-board Bus Battery en-route.**
 - 3.1.4. Where a bus in service has to be withdrawn due to a defective radio.
 - 3.1.5. Where the reason for the lost Kilometerage is unknown or is in doubt.

4. Traffic (Non-Deductible)

- 4.1. In service kilometerage not operated due to traffic causes may include (but is not limited to):
 - 4.1.1. Curtailments or lost journeys arising from the effect of traffic congestion whatever the cause.

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4.1.2. Losses arising from staff being late in reaching changeover points must not be included unless it can be shown that the staff left the garage on time and that the allowed running time from garage to changeover point is adequate under normal circumstances.

4.1.3. Losses arising from road traffic accidents involving the Concessionaire's vehicle.

5. Other Non-Deductible

5.1. In service kilometrage not operated due to something beyond the Concessionaire's reasonable control but which is not covered by traffic causes may include (but is not limited to):

5.1.1. Incidents

Any kilometrage losses resulting from incidents reportable to OCC (as defined in Incident Reporting).

Non-deductible losses apply only to the day the incident occurred and should not exceed the remainder of the duty in question unless exceptional circumstances are explained. For road traffic accidents or vandalism whilst in service it must be demonstrated that action was taken as quickly as possible to render the vehicle(s) fit for service Evidence must be readily available to show the number of vehicles affected, incident times, the extent of the damage, engineers action etc.

5.1.2. Disasters

Where a major occurrence requires a fundamental change to the planned operation, for example accidents or explosions.

Losses arising from traffic congestion caused by these events will be classified as non deductible.

5.1.3. Road Closed/Blocked

Where vehicles are 'turned back' or prevented from completing part of the route, for example security alerts, diversions, or roads blocked.

Losses arising from traffic congestion caused by these events should be classed as non deductible.

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Annexure J

CATEGORY WISE LIST OF INFRACTION

Table 3.A : Category A Infraction

S. No.	Description of the infraction
	Safety
1	Damaged/Missing window safety guard rails
2	Loose electrical wiring/ tampering with electrical wiring harness
3	Missing, expired or unspecified medicines in the first aid box or kit
4	Lack of specified fire extinguishers, empty or partially empty fire extinguishers that are beyond the date of expiry, or do not specify the expiry date.
5	Defective, damaged, or an otherwise inoperative wheelchair ramp.
6	Damaged floor, steps, hatches, or hatch covers inside the bus
7	Missing, damaged, or loosely hanging rub rails, hand grab rails, and hand holds
8	Missing, broken, or loosely hanging, seat belts, or wheel chair anchorages
9	Missing, non operative, or blackened saloon lights, indicator lights, wiper system, wiper blades, prescribed horn and any indicating instruments (per item)
10	Fixing any additional lights, gadgets, guards, fixtures, etc. on the exterior of the bus in contravention to the Applicable Laws.
11	Fitment of radio, music system, or any other gadgets inside the bus in contravention to the Applicable Laws.
	Operations
12	Not stopping at authorized bus stops on the Route
13	Delaying operation of Stage Carriage Services without cause.
14	Parking vehicles in stations against permitted rules and regulations.
15	Driver smoking while on board the bus
16	Picking and dropping passengers at unauthorized bus stops
	Quality
17	To operate vehicle with visible dents that are more than 6" in depth.
18	Oil spillage on wheel rims, hubs, tyres, etc
19	Discoloration, peeling paint, or unpainted repair work inside the bus or on any of its items

Table 3.B : Category B Infraction

S. No.	Description of the infraction
	Safety
1	Running the bus with a lux level less than 70 in the saloon area
2	To operate with defective front, side and/or back brake lights
3	Section of handrail loose or with sharp edges

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S. No.	Description of the infraction
4	Inadequate operation of passenger access doors, either due to damage or incorrect operation which affects the boarding and alighting of passengers
5	Defective, emergency exits and hatches or damaged or bent bumpers
6	Not adhering to required staff training schedules and programs.
	Operations
7	Removal of catalytic convertor or running the bus without a working catalytic converter, or not replacing the catalytic converter when required
8	Not carrying a Passenger Complaint Book or a refusal to give the Passenger Complaint Book on demand to a passenger or a IM' representative
9	Parking Stage Carriage Buses in places other than those prescribed by IM
10	Deviating from the route of a service without the prior authorization or instruction of IM/ Police without due cause
11	Not assisting wheel-chair passengers and the mobility impaired in boarding/alighting/anchoring their wheel chair, or in accessing and egressing from the bus. Refusing to provide all necessary support to the mobility impaired.
12	Failed to provide uniform to drivers in terms of para 7 of Annexure B of this Schedule.
	Quality
13	Dirty vehicle, outside or inside, at the beginning of the journey
14	Damaged, broken, loosely fitted, or missing passenger seats, excessive sound in the interior of the bus due to malfunctioning of AC System etc.
15	Display of incorrect passenger route information, inadequately lit or illegible display of passenger information at any of designated locations for displaying passenger information on the bus
16	Not complying with Pollution Control Norms and/ or allowing the vehicle to emit a high level of visible exhaust (smoke).
17	Display of slogans, posters on the bus without prior approval of IM.

Table 3.C : Category C Infraction

S. No.	Description of Infraction
	Safety
1	To reduce the percentage of visual transmission of lights of safety glasses beyond normal as prescribed in Rule 100(2) of CMVR
2	To drive with lights off in the saloon area and/or destination boards after lighting up time
3	Use of unauthorized electronic equipment by the driver while driving (Cell Phones, Walkman etc.)
4	Causing minor road accidents
5	Violation of any of the legal requirements related to registration, operation and maintenance of the buses
6	Fitment of an Air Pressure Horn
7	Driving the bus in a defective condition or sub-optimal performance/ failure of

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	air conditioning (AC) System.
8	Bus while in service running out of State of Charge of on-board Bus Battery en-route.
	Operations
9	Operating unauthorized trips such as trips which do not form part of the Schedule
10	Tampering On-board Equipment
11	Driver quarrelling with passenger(s) or road users or otherwise ill treating passengers or other road users.
12	Operational staff working beyond authorized working hours permitted under Applicable Laws.
13	Use of drivers without proper registration
	Quality
14	To use or modified colors and designs of the external paintwork of the vehicle outside the standards parameters as notified by Transport Department, GNCTD
15	To place advertising material not authorized by IM or to infringe regulations regarding advertising material in vehicles

Table 3.D : Category D Infraction

S. No.	Description of the infraction
	Safety
1	Damaged, or over worn tyres, poor quality retreading of tyres, poorly inflated tyres etc.
2	Causing Major road accidents.
	Miscellaneous - Contractual Compliances
3	Failure to deliver incident information on time, as required by IM as specified in the Concession Agreement
4	To refuse to accept the visits of IM inspectors or authorized representatives. To hide information or to provide partial or erroneous information.
5	To implement administrative and accounting practices which impair the reliability of the accounting and financial information which the Concessionaire is required to keep in accordance with this Agreement.
6	To transfer title of any Bus without prior written authorization of IM.
7	Failure to provide adequate information to IM/ Police/ DoT in relation to accident/s, injury to persons, damage to public / third party property
8	Employing staff who do not meet Permit Conditions
9	Misinformation or an attempt to hide anti-social incidents on the bus or accidents en-route
10	Driver carrying weapons/arms of any kind on board the bus/ on person while on duty
11	To reduce the percentage of visual transmission of lights of safety glasses beyond normal as prescribed in Rule 100(2) of CMVR

Table 3.E : Category E Infractions

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S. No.	Description of the infraction
1	Over speeding, rash driving (driving bus beyond prescribed speed limit as notified from time to time)
2	Driving drunk on duty or driving the bus while in a drunken state
3	Tampering of speed governors
4	Jumping red lights, stopping the bus beyond the stop line at traffic signals

Category F Infractions

Table 3.F: Details of Infractions, which shall be measured on the basis of random sample checks conducted by IM' authorized officials.

S. No.	Description of the infraction
1F	Driver not wearing prescribed dress, badges, shoes, etc
2F	Dirty vehicle, outside or inside at the beginning of the journey.
3F	Not carrying a valid driving license, identity card or driving authorization, etc.
4F	Not carrying the correct vehicle registration certificate, vehicle insurance, PUCC, any other prescribed document, etc
5F	Broken side, front or back window, glasses or wind screen glasses
6F	Defective, damaged electronic PIS

The deductions and the incentives for the above performance standards will be as per the following:

Average Score per bus	Incentive / Deduction for the fleet
Less than 1	Incentive of Rs. 750X No. of total buses in the cluster
1 or more, less than 2	Incentive of Rs. 150 X No. of total buses in the cluster
2 or more, less than 4	Penalty of Rs. 300 X No. of total buses in the cluster
4 or more	Penalty of Rs. 750 X No. of total buses in the cluster

Checking Modalities:

The performance of the Concessionaire shall be evaluated on monthly basis, at the discretion of IM. In order to measure the performance of the Concessionaire on the above parameters, sample checks shall be conducted by IM' authorized officials on a random basis, at least one random check shall be carried during the month. However, IM reserves the right to conduct, more than one check during any given month, in which case the average of all checks conducted during the month shall be considered. In case, due to any reason, no check is carried out during a month, no incentive or deduction shall be applicable.

Each bus that is checked shall be assigned a score on a scale from 0 to 6 (0 being Very Good and 6 being Very Poor) based on infractions observed during the checks. The average score shall be computed for all the buses checked during the fortnight. The incentive and deduction for the fleet shall be computed and applied during the fortnight, as per the applicable slab.

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Example:

A Concessionaire holds a fleet of 80 buses. Every fortnight, 8 buses shall be checked on random basis for infractions mentioned in Table 3F. Each bus will be ranked for each infraction on a scale from 0 to 6. Let the score obtained by each bus for various infractions are the following:

	Bus 1	Bus 2	Bus 3	Bus 4	Bus 5	Bus 6	Bus 7	Bus 8
Infraction 1F	0	1	0	1	1	0	1	0
Infraction 2F	0	1	0	1	1	0	1	0
Infraction 3F	0	0	0	1	1	0	1	0
Infraction 4F	1	0	0	1	1	0	0	1
Infraction 5F	1	1	0	1	1	0	0	1
Infraction 6F	0	0	0	0	1	1	1	0
Total	2	3	0	5	6	1	4	2

The total score for all the buses checked is 23. The average score per bus is 23 divided by 8 (No. of buses checked) i.e. 2.9. The deduction applicable for the month shall be Rs. 300 multiplied by the total number of buses in the fleet i.e. 80, which works out to Rs. 24,000.

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Annexure K

COMPLIANCE FORMAT

Sr. No.	Model No.	Chassis Number	Engine Number	Registration Details		Fitness Details			Permit Details		Insurance				Road Tax			EMC-compatibility Test		Insulation Test																						
				Regn. Number	Regn. Date	Certificate No.	Date of issue	Valid Till	Permit No.	Valid Till	Policy No.	Date of Issue	Valid till	Ins Co.	Receipt Number	Date of issue	Road Tax Valid till	Receipt No.	Date of issue	Validity	Receipt No.	Date of issue	Validity																			

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SUBSTITUTION AGREEMENT

SCHEDULE 4

THIS SUBSTITUTION AGREEMENT is entered into on this the _____ day of _____ 201__ at _____.

AMONGST

The President of India, acting through the Secretary and Commissioner, Transport Department and having its principal office at 5/9 Under Hill Road, Delhi 110006 (hereinafter referred to as the “**DoT**” which expression shall unless repugnant to the context or meaning thereof include its, successors and assigns) of the First Part;

_____ a company incorporated under the provisions of the Companies Act, 2013/ a Scheduled Caste/Scheduled Tribe Co-operative Society registered under the Delhi Co-operative Societies Act, 2003 and having its registered office at *****, (hereinafter referred to as the “**Concessionaire**” which expression shall unless repugnant to the context or meaning thereof include its successors and permitted assigns and substitutes) of the Second Part; and

_____ [name and particulars of Lenders’ Representative] and having its registered office at _____, acting for and on behalf of the Lenders as their duly authorised agent with regard to matters arising out of or in relation to this Agreement (hereinafter referred to as the “**Lenders’ Representative**”, which expression shall unless repugnant to the context or meaning thereof include its successors and trustees for the time being) of the Third Part;

WHEREAS:

- (A) DoT has entered into a Concession Agreement dated _____ with the Concessionaire (the “**Concession Agreement**”) for operation of Stage Carriage Services in Delhi for Cluster No.____ (specify Cluster No.).
- (B) The Lenders have agreed to finance the Project in accordance with the terms and conditions set forth in the Financing Documents.
- (C) The Lenders have requested DoT to enter into this Substitution Agreement for securing their interests through assignment, transfer and substitution of the rights of the Concessionaire under the Concession Agreement to a Nominated Company in accordance with the provisions of this Agreement and the Concession Agreement.

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- (D) In order to enable implementation of the Project including its financing, procurement, construction, operation and maintenance, DoT has agreed and undertaken to transfer and assign the rights of the Concessionaire under the Concession Agreement to a Nominated Company in accordance with the terms and conditions set forth in this Agreement and the Concession Agreement.
- (E) With a view to facilitate financing of the Project by the Concessionaire, and in pursuance of Clause 11.7 of the Concession Agreement, DoT and the Concessionaire have agreed to enter into Substitution Agreement being these presents with the Lenders representatives.

NOW THEREFORE IN CONSIDERATION OF THE PREMISES AND THE MUTUAL COVENANTS HEREINAFTER CONTAINED, THE PARTIES HERETO HEREBY AGREE AND THIS AGREEMENT WITNESSETH AS FOLLOWS as follows:

1 DEFINITIONS AND INTERPRETATION

1.1 Definitions

In this Substitution Agreement, the following words and expressions shall have the meaning hereinafter respectively assigned to them:

“Agreement” means this Substitution Agreement and any amendment thereto made in accordance with the provisions contained in this Agreement.

“Financial Default” means occurrence of a material breach of the terms and conditions of the Financing Documents or a continuous default in Debt Service by the Concessionaire for a minimum period of _____().

“Financing Documents” means the documents executed by the Concessionaire in respect of financial assistance provided by the Lenders by way of loans, guarantees, subscription to non-convertible debentures and other debt instruments including loan agreements, guarantees, notes, debentures, bonds and other debt instruments, security agreements, and other documents relating to the financing (including refinancing) required for the implementation of the Project.

“Lenders’ Representative” means the person referred to as the Lenders’ Representative in the foregoing Recitals.

“Nominated Company” means a company, incorporated under the provisions of the Companies Act, 1956/ a Scheduled Caste/Scheduled Tribe Co-operative Society registered under the Delhi Co-operative Societies Act, 2003, selected by the Lenders’ Representative, on behalf of Lenders, and proposed to the DoT for assignment/transfer of the rights of the Concessionaire under the Concession Agreement as provided in this Agreement.

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“**Notice of Financial Default**” shall have the meaning ascribed thereto in Clause 3.2.1.

“**Parties**” means the parties to this Agreement collectively and “**Party**” shall mean any of the Parties to this Agreement individually.

1.2 Interpretation

1.2.1 References to Lenders’ Representative shall, unless repugnant to the context or meaning thereof, mean references to the Lenders’ Representative, acting for and on behalf of Lenders.

1.2.2 References to Clauses are, unless stated otherwise, references to Clauses of this Agreement.

1.2.3 The words and expressions beginning with capital letters and defined in this Agreement shall have the meaning ascribed thereto herein, and the words and expressions used in this Agreement and not defined herein but defined in the Concession Agreement shall, unless repugnant to the context, have the meaning ascribed thereto in the Concession Agreement.

1.2.4 The rules of interpretation stated in Clauses 1.2 and 1.3 of the Concession Agreement shall apply, *mutatis mutandis*, to this Agreement.

2 ASSIGNMENT

2.1 Assignment of rights and title

The Concessionaire hereby assigns the rights, title and interest of the Concessionaire under the Concession Agreement to, and in favour of, the Lenders’ Representative pursuant to and in accordance with the provisions of this Agreement and the Concession Agreement by way of security in respect of financing by the Lenders under the Financing Documents.

3 SUBSTITUTION OF THE CONCESSIONAIRE

3.1 Rights of substitution

3.1.1 Pursuant to the rights, title and interest assigned under Clause 2.1, the Lenders’ Representative shall be entitled to substitute the Concessionaire by a Nominated Company under and in accordance with the provisions of this Agreement and the Concession Agreement.

3.1.2 The DoT hereby agrees to substitute the Concessionaire by endorsement on the Concession Agreement in favour of the Nominated Company selected by the Lenders’ Representative in accordance with this Agreement.

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3.1.3 Notwithstanding anything contained under sub-clause 3.1.2 above, the DoT shall have the paramount right to reject the Nominated Company selected by the Lenders' Representative without assigning any reasons thereof.

3.2 Substitution upon occurrence of Financial Default

3.2.1 Upon occurrence of a Financial Default, the Lenders' Representative may issue a notice to the Concessionaire (the "**Notice of Financial Default**") along with particulars thereof, and send a copy to DoT for its information and record. A Notice of Financial Default under this Clause 3 shall be conclusive evidence of such Financial Default and it shall be final and binding upon the Concessionaire for the purposes of this Agreement.

3.2.2 Upon issue of a Notice of Financial Default hereunder, the Concessionaire shall have the right to cure such Financial Default, to the satisfaction of the Lenders' Representative, within a period of _____() days from the date of receipt of Notice of Financial Default (hereinafter referred to as "**the Cure Period**"), failing which the Lenders' Representative may, without prejudice to any of its rights or remedies under this Agreement or the Financing Documents, substitute the Concessionaire by a Nominated Company in accordance with the provisions of this Agreement.

3.2.3 At any time after the expiry of the Cure Period, the Lenders' Representative may request DoT to terminate the Concession Agreement forthwith by issuing a Termination Notice in accordance with the provisions of the Concession Agreement; provided that upon written request from the Lenders' Representative and the Concessionaire, the DoT may extend the aforesaid Cure Period by a period not exceeding _____() days.

3.3 Substitution upon occurrence of Concessionaire's Event of Default

3.3.1 Upon occurrence of a Concessionaire's Event of Default, the DoT shall by a notice inform the Lenders' Representative of its intention to issue a Termination Notice and grant Fifteen (15) days time to the Lenders' Representative to make a representation, stating the intention to substitute the Concessionaire by a Nominated Company.

3.3.2 In the event that the Lenders' Representative makes a representation to DoT within the period of Fifteen (15) days specified in Clause 3.3.1, stating that it intends to substitute the Concessionaire by a Nominated Company, the Lenders' Representative shall be entitled to undertake and complete the substitution of the Concessionaire by a Nominated Company in accordance with the provisions of this Agreement within a period of one hundred and eighty (180) days from the date of such representation, and DoT shall withhold Termination for the aforesaid period of one hundred and eighty (180) days; provided that upon written request from the Lenders' Representative and the Concessionaire, DoT shall extend the

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aforesaid period of one hundred and eighty (180) days by a period not exceeding ninety (90) days.

3.4 Procedure for substitution

3.4.1 DoT and the Concessionaire hereby agree that on or after the date of expiry of Cure Period or the date of representation to the DoT under Clause 3.3.2, as the case may be, the Lenders' Representative may, without prejudice to any of the other rights or remedies of the Lenders, invite, negotiate and procure offers, either by public auction or tenders for the implementation of the Project to the Nominated Company upon such Nominated Company's assumption of the liabilities and obligations of the Concessionaire towards operation of the Stage Carriage Services under the Concession Agreement and towards the Lenders under the Financing Documents.

3.4.2 The Nominated Company shall, in any event whatsoever, in order to be eligible for substitution in place of the Concessionaire, be required to fulfil the eligibility criteria that were laid down by DoT in RFQ and/or RFP Document for short listing the bidders for award of the Project; provided that the Lenders' Representative may represent to the DoT that all or any of such criteria may be waived in the interest of the Project, and if the DoT determines that such waiver shall not have any material adverse effect on the Project, it may waive all or any of such eligibility criteria.

3.4.3 Upon selection of a Nominated Company, the Lenders' Representative shall request DoT to:

- (a) accede to the request to transfer to the Nominated Company the right to implement the Project in accordance with the provisions of the Concession Agreement;
- (b) endorse and transfer the rights of the Concessionaire, under the Concession Agreement, to the Nominated Company, on the same terms and conditions, for the residual Concession Period; and
- (c) enter into a Substitution Agreement with the Lenders' Representative and the Nominated Company on the same terms as are contained in the Concession Agreement.

3.4.4 If DoT has any objection to the transfer of the rights of the Concessionaire under the Concession Agreement in favour of the Nominated Company in accordance with this Agreement, it shall within Thirty (30) days from the date of request made by the Lenders' Representative, give a reasoned order after hearing the Lenders' Representative.

Provided that in the event of such objection by DoT, the Lenders' Representative may propose another Nominated Company whereupon

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the procedure set forth in this Clause 3.4 shall be followed for substitution of such Nominated Company in place of the Concessionaire.

3.5 Selection to be binding

The decision of the Lenders' Representative and DoT in selection of the Nominated Company shall be final and binding on the Concessionaire. The Concessionaire irrevocably agrees and waives any right to challenge the actions of the Lenders' Representative or the Lenders or the DoT taken pursuant to this Agreement including the transfer/assignment of the rights of the Concessionaire under the Concession Agreement in favour of the Nominated Company. The Concessionaire agrees and confirms that it shall not have any right to seek revaluation of assets of the Project or the Concessionaire's shares. It is hereby acknowledged by the Parties that the rights of the Lenders' Representative are irrevocable and shall not be contested in any proceedings before any court or Tribunal and the Concessionaire shall have no right or remedy to prevent, obstruct or restrain DoT or the Lenders' Representative from effecting or causing the transfer by substitution and endorsement of the Concession as requested by the Lenders' Representative.

4 PROJECT AGREEMENTS

4.1 Substitution of Nominated Company in Project Agreements

The Concessionaire shall ensure and procure that each agreement entered into with supplier, Vendors, service provider, contractor for the Project contains provisions that entitle the Nominated Company to step into such Project Agreement, in its discretion, in place and substitution of the Concessionaire in the event of such Nominated Company's assumption of the liabilities and obligations of the Concessionaire under the Concession Agreement.

5 TERMINATION OF CONCESSION AGREEMENT

5.1 Termination upon occurrence of Financial Default

At any time after the expiry of the Cure Period, the Lenders' Representative may by a notice in writing require DoT to terminate the Concession Agreement forthwith, and upon receipt of such notice, DoT shall undertake Termination under and in accordance with the provisions of the Concession Agreement.

5.2 Termination when no Nominated Company is selected

In the event that no Nominated Company acceptable to DoT is selected and recommended by the Lenders' Representative within the period of one hundred and eighty (180) days or any extension thereof as set forth in Clause 3.3.2, DoT may terminate the Concession Agreement forthwith in accordance with the provisions thereof.

5.3 Realisation of Debt Due

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DoT and the Concessionaire hereby acknowledge and agree that, without prejudice to their any other right or remedy, the Lenders' Representative is entitled to receive from the Concessionaire, without any further reference to or consent of the Concessionaire, the Debt Due upon Termination of the Concession Agreement.

6 DURATION OF THE AGREEMENT

6.1 Duration of the Agreement

- 6.1 This Agreement shall come into force from the date hereof and shall expire at the earliest to occur of the following events:
- (a) Termination of the Concession Agreement; or
 - (b) no sum is outstanding to the Lenders under the Financing Documents.

7 INDEMNITY

7.1 General indemnity

- 7.1.1 The Concessionaire will indemnify, defend and hold DoT and the Lenders' Representative harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense of whatever kind and nature arising out of any breach by the Concessionaire of any of its obligations under this Agreement or on account of failure of the Concessionaire to comply with Applicable Laws and Applicable Permits.
- 7.1.2 DoT will indemnify, defend and hold the Concessionaire harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense arising out of failure of DoT to fulfil any of its obligations under this Agreement, materially and adversely affecting the performance of the Concessionaire's obligations under the Concession Agreement or this Agreement, other than any loss, damage, cost and expense, arising out of acts done in discharge of their lawful functions by DoT, its officers, and agents.
- 7.1.3 The Lenders' Representative will indemnify, defend and hold the Concessionaire harmless against any and all proceedings, actions and third party claims for any loss, damage, cost and expense arising out of failure of the Lenders' Representative to fulfil its obligations under this Agreement, materially and adversely affecting the performance of the Concessionaire's obligations under the Concession Agreement, other than any loss, damage, cost and expense, arising out of acts done in discharge of their lawful functions by the Lenders' Representative, its officers and agents.

7.2 Notice and contest of claims

In the event that any Party hereto receives a claim from a third party in respect of which it is entitled to the benefit of an indemnity under Clause 7.1 or in respect of which it is entitled to reimbursement (the "**Indemnified Party**"), it shall notify the other Party responsible for indemnifying such claim hereunder (the

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“**Indemnifying Party**”) within Fifteen (15) days of receipt of the claim and shall not settle or pay the claim without the prior approval of the Indemnifying Party, such approval not to be unreasonably withheld or delayed. In the event that the Indemnifying Party wishes to contest or dispute the claim, it may conduct the proceedings in the name of the Indemnified Party and shall bear all costs involved in contesting the same. The Indemnified Party shall provide all cooperation and assistance in contesting any claim and shall sign all such writings and documents as the Indemnifying Party may reasonably require.

8 DISPUTE RESOLUTION

8.1 Dispute resolution: Arbitration

(a) Procedure

Any Dispute, which is not resolved amicably, shall be finally settled by binding arbitration under the Arbitration and Conciliation Act, 1996. The arbitration shall be by a panel of three arbitrators, one to be appointed by each Party and the third to be appointed by the two arbitrators appointed by the Parties. The Party requiring arbitration shall appoint an arbitrator in writing, inform the other Party about such appointment and call upon the other Party to appoint its arbitrator. If within thirty (30) days of receipt of such intimation the other Party fails to appoint its arbitrator, the Party seeking appointment of arbitrator may take further steps in accordance with Arbitration Act.

(b) Place of Arbitration

The place of arbitration shall be at Delhi but by agreement of the Parties, the arbitration hearings, if required, may be held elsewhere in India.

(c) English Language

The request for arbitration, the answer to the request, the terms of reference, any written submissions, any orders and awards shall be in English and, if oral hearings take place, English shall be the language to be used in the hearings. The Award shall be a speaking order.

(d) Performance during Arbitration

Pending the submission of and/or decision on a dispute and until the arbitrage award is published, the Parties shall continue to perform their respective obligations under this Agreement without prejudice to a final adjustment in accordance with such award.

(e) Costs

Each of the Parties to this Agreement shall bear their own respective costs for and during the Arbitration and shall not raise any claim in respect thereof as against the other Party.

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9 MISCELLANEOUS PROVISIONS

9.1 Governing law and jurisdiction

This Agreement shall be construed and interpreted in accordance with and governed by the laws of India, and the Courts at Delhi alone shall have jurisdiction over all matters arising out of or relating to this Agreement.

9.2 Waiver of sovereign immunity

The DoT unconditionally and irrevocably:

- (a) agrees that the execution, delivery and performance by it of this Agreement constitute commercial acts done and performed for commercial purpose;
- (b) agrees that, should any proceedings be brought against it or its assets, property or revenues in any jurisdiction in relation to this Agreement or any transaction contemplated by this Agreement, no immunity (whether by reason of sovereignty or otherwise) from such proceedings shall be claimed by or on behalf of the DoT with respect to its assets;
- (c) waives any right of immunity which it or its assets, property or revenues now has, may acquire in the future or which may be attributed to it in any jurisdiction; and
- (d) consents generally in respect of the enforcement of any judgement or award against it in any such proceedings to the giving of any relief or the issue of any process in any jurisdiction in connection with such proceedings (including the making, enforcement or execution against it or in respect of any assets, property or revenues whatsoever irrespective of their use or intended use of any order or judgement that may be made or given in connection therewith).

9.3 Priority of agreements

In the event of any conflict between the Concession Agreement and this Agreement, the provisions contained in the Concession Agreement shall prevail over this Agreement.

9.4 Alteration of terms

All additions, amendments, modifications and variations to this Agreement shall be effectual and binding only if in writing and signed by the duly authorised representatives of the Parties.

9.5 Waiver

- 9.5.1 Waiver by any Party of a default by another Party in the observance and performance of any provision of or obligations under this Agreement:

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- (a) shall not operate or be construed as a waiver of any other or subsequent default hereof or of other provisions of or obligations under this Agreement;
- (b) shall not be effective unless it is in writing and executed by a duly authorised representative of the Party; and
- (c) shall not affect the validity or enforceability of this Agreement in any manner.

9.5.2 Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation thereunder nor time or other indulgence granted by a Party to another Party shall be treated or deemed as waiver of such breach or acceptance of any variation or the relinquishment of any such right hereunder.

9.6 No third party beneficiaries

This Agreement is solely for the benefit of the Parties to the agreement and no other person or entity shall have any rights hereunder.

9.7 Survival

9.7.1 Termination of this Agreement:

- (a) shall not relieve the Parties of any obligations hereunder which expressly or by implication survive termination hereof; and
- (b) except as otherwise provided in any provision of this Agreement expressly limiting the liability of either Party, shall not relieve either Party of any obligations or liabilities for loss or damage to the other Party arising out of or caused by acts or omissions of such Party prior to the effectiveness of such termination or arising out of such termination.

9.7.2 All obligations surviving the cancellation, expiration or termination of this Agreement shall only survive for a period of Three (3) years following the date of such termination or expiry of this Agreement.

9.8 Severability

If for any reason whatever any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties will negotiate in good faith with a view to agreeing to one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable to such invalid, illegal or unenforceable provision. Failure to agree upon any such provisions shall not be subject to dispute resolution under Clause 8 of this Agreement or otherwise.