Section VI: Requirements

Preamble

This Section shall provide sufficient information to enable Participants to prepare comprehensive, realistic and competitive proposals addressing the Client's requirements.

The Requirements shall form an integral part of the resulting Contract.

The Requirements consist of the following parts:

• Scope of Supply;

• Delivery Requirements;

• Technical Specifications;

• Drawings, where appropriate.

The Client shall ensure that the ESHS requirements, specified in the Project legal agreements, are appropriately reflected in the Requirements.

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Scope of Supply

Purpose of the Goods and Related Services

The Clients intend to acquire the Goods and Related Services described below in order to *provide the services of passenger transportation on fixed routes in Vilnius, Lithuania.*

Participants shall ensure that the Goods and Related Services they propose are fit for the stated purpose.

The Supplier shall ensure that the Goods delivered and the Related Services performed under the Contract are fit for the stated purpose.

List of the Goods

No.	Title of Goods	Brief description	Quantity
1.	**Goods**		
1.1	Trolleybuses	New three-axle single deck articulated low floor trolleybuses with autonomous mileage (vehicle code M_3CGT) for carriage of passengers as detailed in chapters I and II of the Requirements below	73 vehicles
1.2	Documentation	Mandatory set of documentation as detailed in chapter VIII of the Requirements below	1 set
2.	**Tools**		
2.1	Diagnostic and maintenance equipment	Set of equipment as detailed in chapter VII of the Requirements below	1 set

List of the Related Services

No.	Title of Related Service	Brief description	Quantity
1.	Training for the Purchaser's technicians	10 (ten) advanced repair technicians – not later than 10 working days from delivery of the 1st trolleybus as per chapter IX of the Requirements below	1 session
2.	Training for the Purchaser's technicians (aditional)	10 (ten) advanced repair technicians – before expiry of the trolleybus warranty period. The date of the additional training shall be agreed by the parties.	1 session
3.	Training for the Purchaser's trolleybus drivers' instructors	Detailed instructions and training for ECO driving of 9 (nine) driver instructors as per chapter IX of the Requirements below	3 sessions (3 (three) driver instructors per session)

Delivery Requirements

Delivery Periods

The delivery periods below are expressed in days (weeks) and are calculated from the Commencement Date, as defined in the Contract, the date of receipt of advance payment by the Supplier.

Destination - Client's site (premises), defined as: **JSC "Vilniaus viešasis transportas" (VVT), Justiniškių str. 14, Vilnius, LT-05131, Republic of Lithuania**.

Partial deliveries within the specified periods are allowed.

The required Completion date is no later than: 532 days (76 weeks) from the Commencement date.

Early delivery is encouraged.

Goods

The Goods shall be delivered within the following periods:

No.	Title of Goods	Quantity	Delivery terms	Delivery period
1.	Trolleybuses	20	DDP, Vilnius JSC "Vilniaus viešasis transportas", Justiniškių str. 14, LT-05131 Vilnius, Republic of Lithuania	434 days (62 weeks)
2.	Trolleybuses	28	DDP, Vilnius JSC "Vilniaus viešasis transportas", Justiniškių str. 14, LT-05131 Vilnius, Republic of Lithuania	483 days (69 weeks)
3.	Trolleybuses	25	DDP, Vilnius JSC "Vilniaus viešasis transportas", Justiniškių str. 14, LT-05131 Vilnius, Republic of Lithuania	532 days (76 weeks)
4.	Documentation as per chapter VIII of the Requirements below	1	JSC "Vilniaus viešasis transportas", Justiniškių str. 14, LT-05131 Vilnius, Republic of Lithuania	434 days (62 weeks)
5.	Set of Diagnostic and maintenance equipment as per chapter VII of the Requirements below	1	DDP, Vilnius JSC "Vilniaus viešasis transportas", Justiniškių Str. 14, LT-05131 Vilnius, Republic of Lithuania	434 days (62 weeks)

Related Services

The Related services shall be provided within the period stated below depending on the actual delivery of the separate batches of the trolleybuses.

No.	Title of Related Service	Quantity	Place	Completion period
1.	Training for the Purchaser's technicians	1 session for 10 (ten) technicians (advanced repair technicians)	At the Client's premises, Vilnius, Lithuania	Not later than 10 working days from delivery of the 1st trolleybus
2.	Training for the Purchaser's technicians (additional)	1 session for 10 (ten) technicians (advanced repair technicians)	At the Client's premises, Vilnius, Lithuania	Before expiry of the trolleybus warranty period. The date of the additional training shall be agreed by the parties.
3.	Training for the Purchaser's trolleybus drivers' instructors	3 sessions for 3 (three) driver instructors per session, 9 (Nine) driver instructors in total	At the Client's premises, Vilnius, Lithuania	Upon delivery of the 1st trolleybus. The date of the training for trolleybus drivers' instructors shall be agreed by the parties.

Technical Specifications

I. GENERAL REQUIREMENTS

1. Seventy-three (73) new articulated tri-axle low-floor single-deck trolleybuses (vehicle code M_3CGT) for the carriage of passengers (hereafter - the vehicles, the trolleybuses).
2. The vehicles shall comply with the requirements for Class I passenger vehicles set out in United Nations Vehicle Regulation No 107, available at https://eur-lex.europa.eu/legal-content/LT/TXT/?uri=CELEX%3A42015X0618%2801%29, and with other requirements set out in this Technical Specification.
3. Trolleybuses must comply with the Technical Requirements for Motor Vehicles and their Trailers approved by Order No 2BE-260 of the Director of the Lithuanian Transport Safety Administration of 20 October 2022, as amended (TAR, 20/10/2022, No 21281; TAR, 06/04/2023, No 6693; TAR, 21/11/2023, No 22387).
4. Trolleybuses must comply with the requirements set out in Annex II "B" of Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019, including the requirements that will enter into force on 7 July 2026, which can be found at https://eur-lex.europa.eu/legal-content/lt/TXT/?uri=CELEX%3A32019R2144
5. A Purchaser managing critical information infrastructure, operating in areas considered to be part of the sectors of the economy strategically important for national security, or included in the list of users of the Safety Net, in conducting the procurements involving goods or services of the CPV codes specified in the list referred to in Article 92(13) of the Law of the Republic of Lithuania on Public Procurement, shall consider that the Participant has interests that may pose a threat to the national security and shall prohibit the Participants, their subcontractors or economic operators whose capacities are relied upon, who are themselves registered (if the Participant, its subcontractor, the economic operator whose capacities are relied upon, or the controlling person is a natural person - permanently residing or having citizenship) in the countries or territories referred to in the list provided for in Article 92(14) of the Law, from taking part in the procurement.
6. The parts used in the construction of the trolleybus, which correspond to the list in Article 92(13) of the Law of the Republic of Lithuania on Public Procurement, are listed in V Section VI, Requirements. The Participant must provide a list of these parts, including the information of the manufacturer and the country of origin.
7. Trolleybuses shall be new, not operated, fit for the carriage of passengers, of full completion and meet the requirements set out in these Requirements. They must be in the technical condition which allows them to be safely put into service immediately after delivery to the Purchaser.
8. The Participant shall give the representatives of the Purchaser the opportunity and access to inspect the vehicles at the time of manufacture and to assess their technical and aesthetic condition and conformity with the specification and these Requirements contained in the Participant's tender. Access shall be granted to the representatives of the Purchaser within 10 (ten) calendar days of receipt of the written notification.

9. At the time of transfer of the Trolleybuses, the Supplier shall provide the Purchaser with a mandatory technical inspection card valid in the Republic of Lithuania for each of the Trolleybuses to be transferred, which shall be valid for at least ten (10) months from the date of the handover of the Trolleybuses to the Purchaser.
10. The Supplier shall submit with the Trolleybuses copies of the Certificate of Conformity of the Vehicles and the EC type-approval certificate, of the certificate provided for in Annex IV to Regulation No 1060/2008/EC or in the relevant Annex to the individual Directive or Regulation, or of the national type-approval certificate (Certificate of Conformity), or of any other European standard, as well as of the Lithuanian standard transposing the European standard, or of the European standard or any other equivalent standard.
11. Where the specification refers to a particular model or source of supply, a particular process specific to the goods or services supplied by a particular Participant, or to a trademark, patent, types, specific origin or manufacture which would favour or exclude certain entities or certain products, an equivalent may be provided.
12. During the warranty period, the mandatory Technical Servicing and Maintenance and Maintenance Repairs shall be provided at the Purchaser's production premises (at Justiniškių str.14 and Žolyno str.15 in Vilnius), and the Warranty and Non-Warranty Repairs shall be provided at a location agreed with the Purchaser. The Purchaser undertakes to provide the Supplier with the necessary premises for the Trolleybus Maintenance and Service Stations (up to 300 sq. m) and up to 50 sq. m for the Supplier's warehouse and consignment warehouse. The Supplier will have to set up the Trolleybus Maintenance and Service Stations by his own efforts and at his own expense. The Purchaser will be able to provide the Supplier only the available technological equipment and only according to a separate agreement.

II. TECHNICAL SPECIFICATIONS FOR THE VEHICLES PURCHASED

Mandatory technical requirements for the articulated three-axle low-floor single-deck trolleybuses (vehicle code M_3CGT)

No	Name	Description
1.	Vehicle	1.1. Articulated three-axle low-floor single-deck trolleybus (vehicle code M_3CGT); 1.2. Suitable for being operated in winter (up to -30ºC) and summer (up to +40ºC) temperatures; 1.3. New, produced no earlier than 2025; 1.4. All vehicles offered must be of the same make and model, assembled according to the same technological process in the same factories.
2.	Vehicles certification	Certified in accordance with the requirements of Directive (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018, as amended;
3.	Total length	From 17 500 mm up to the maximum permissible according to legal acts of the Republic of Lithuania applicable on the date of issue of the certificate of conformity of the vehicle for vehicles of this type.
4.	Width	From 2,490 mm to 2,550 mm. (measured in accordance with the requirements of paragraph 6.2 of ISO 612-1978 (or equivalent standard)).
5.	Floor height	For all doors, the height of entry from the road surface (without the inclination function activated) shall not exceed 340 mm. The floor edges in the door area are marked with a bright contrasting marking.
6.	Number of passengers	6.1. There shall be at least 40 seats, including the driver's seat, and at least 70 standing spaces, and at least 1 seat shall be reserved for a disabled person (with special needs with a wheelchair) (with anchor belts, rails or other wheelchair anchorage) in the low-floor area between the axles of the bus. The layout of seats will be agreed before signing the contract; 6.2. The standing area in front of the second door shall be equipped with backrests for standing passengers;

		 Figure 1. Backrests for standing passengers 6.3. The vehicle must be able to carry bicycles in its passenger compartment and have an internal bicycle rack installed for at least one bicycle.  Figure 2: Example of equipment for transporting bicycles
7.	Passenger boarding / deboarding doors	7.1. Not less than four (4) double doors opening inwards or outwards on the right hand side of the vehicle. The direction of the door opening shall be proposed by the Participant and agreed before contract signature 7.2. The width of the door opening shall not be less than 1,200 mm (measured as the space for getting on/off between fully opened doors); 7.3. Passengers must be provided with a crush guard (the door must open if there is an obstacle between the doors when closing); 7.4. External emergency door openers shall be provided. The emergency opening of all doors shall be secured against spontaneous or accidental pressing; 7.5. Each door shall have handholds on the inside of the door; 7.6. Door handles shall be insulated to protect passengers from electric shock; 7.7. The doors can be operated in two ways: 7.7.1. From the driver's seat, with the option of opening both sides of the first door at once or separately, and of opening all doors separately and all at once; The door controls shall be located at the driver's seat on the right-hand side of the dashboard; 7.7.2. Passenger independent door-opening system: buttons in the passenger compartment and on the outside of the vehicle that allow passengers to open specific doors (including the front doors) independently, which can only be activated by the driver from his/her seat. 7.8. One independent door release button for passengers shall be located at the front door, both inside and outside the vehicle. All other doors shall be provided with two independent door release buttons, both inside and outside the vehicle. An alternative solution (e.g. a button on the door glass) may be possible and shall be agreed with the Purchaser prior to signing the contract 7.9. The buttons for opening the independent door in the passenger compartment shall contrast with the colours of the vehicle interior trim and handrails, and the buttons on the exterior of the vehicle shall contrast with the colour of the exterior. Buttons must be accessible to the blind (embossed or braille). 7.10. The buttons for independent door-opening shall have a "memory" function (if a button is pressed in the vehicle interior while the vehicle is still moving, the system shall record the press and the door shall open when the driver activates the door buttons). In this case, the door-opening button must also act as a "STOP" button.

		 Figure 3: Example of buttons in the passenger compartment and on the exterior of the vehicle 7.11. The first door shall be locked with a key from the outside and opened/closed with a push-button from the inside and outside; 7.12. All doors (except the first door) shall be locked and unlocked from the inside without a key, or with a special key for locking other service lids of vehicles; 7.13. The minimum opening or closing time of the door shall be no more than 3 seconds (the speed of opening and closing shall be adjustable); 7.14. An audible alarm must sound when a door opens or closes; 7.15. The exterior of the trolleybus shall be equipped with a passenger boarding and/or deboarding door light that switches on when the vehicle stops and the door opens; 7.16. When any door is opened, a braking system shall be applied to ensure that the vehicle cannot move when at least one door is open. If the vehicle is moving, the door opening must be automatically blocked.
8.	Ramp for a wheelchair	8.1. The second door must be equipped with a ramp for disabled persons and/or persons with special needs and for baby carriages; 8.2. The ramp shall be capable of supporting a load of at least 350 kg; 8.3. Buttons for announcing the entry or exit of a wheelchair or a baby carriage shall be located on the outside of the door and on the inside of the door near the seat for the disabled. When one of the buttons is activated, the passenger and driver shall be informed by a light and sound signal.
9.	Maximum permissible mass	In accordance with legal acts of the Republic of Lithuania in force on the date of issue of the certificate of conformity of the vehicle.
10.	Driving axle load	In accordance with legal acts of the Republic of Lithuania in force on the date of issue of the certificate of conformity of the vehicle.
11.	Axles	Three.
12.	Turning radius	Not more than 12.5 m. (measured in accordance with the requirements of paragraph 3.4 of Annex 11 to Regulation No 107 of the United Nations Economic Commission for Europe (UN/ECE))
13.	Drivetrain	13.1. A traction motor is an AC electric motor controlled by a motor control unit based on silicon carbide (SIC) transistors or insulated gate bipolar transistors (IGBTs). The electric drive of a trolleybus shall be adapted to the Vilnius City Trolleybus overhead contact line and the electric traction system; 13.2. Trolleybus electric drives and auxiliary converters must be equipped with a monitoring diagnostic system (fault memory required);

		13.3. The engine power must be at least 200 kW. The traction motor shall be so designed as to ensure its operation under the temperature conditions specified in paragraph 1.2; 13.4. The traction motor must be protected from water, snow and dust.
14.	Requirements for traction drive system and electrical equipment	14.1. All equipment connected to 600 DC +/-30% circuits or 380 V AC circuits of the electrical system shall be at least double insulated; 14.2. Passengers and maintenance personnel must be protected from accidental contact with dangerous voltage and stored energy equipment; 14.3. Continuous operation of the power steering shall be ensured when the Trolleybus is travelling on special parts of the overhead lines; 14.4. If there is insufficient pressure in the pneumatic system, any movement of the trolleybus must be stopped. 14.5. The trolleybus must be equipped with a connector to connect a diagnostic computer, which will allow the monitoring of the vehicle's essential parameters and the detection and diagnosis of faults.
15.	Wheels and tyres	15.1. New, non-retreaded, tubeless tyres shall comply with the requirements of United Nations Economic Commission for Europe (UNECE) Regulations No 54 and No 117; 15.2. Tyre labelling must comply with the requirements of Regulation (EC) No 2020/740 of the European Parliament and of the Council; 15.3. Produced no earlier than one year before the delivery of trolleybuses; 15.4. Tyres must be suitable for all seasons (M+S) and bear the  (3PMSF mark); 15.5. Tyres must be the same on all axles. The tyre load index and speed index must meet the requirements for bus tyres; 15.6. Tyres must be designed for public transport in urban conditions (class C3). Tyre sides must be reinforced. It must be possible to deepen and retread the tyre tread. Depreciation indicators must be present. Fuel efficiency class not less than D, wet grip class not less than C and measured external rolling noise not more than 73 dB; 15.7. Trolleybuses must have a tyre pressure monitoring system (TPMS). It must monitor tyre pressure in real time and warn the driver if the pressure deviates from the norm. The tyre pressure information shall be displayed to the driver on the dashboard or on a separate display showing schematically the arrangement of the wheels and axles of the vehicle. Pressure sensors must be mounted inside each wheel and their construction must be designed to allow easy relocation to another wheel or replacement; 15.8. It shall be possible to check the tyre pressure of all wheels with a hand-held tyre pressure gauge, without any special additional equipment.
16.	Hanger	Pneumatic with automatic altitude hold, forced rising and lowering and right-hand tilt functions.
17.	Pneumatic system	17.1. Pipes and hoses in the pneumatic system shall be made of corrosion-resistant materials. Pneumatic system thermal insulation shall ensure that it operates at the temperature conditions specified in paragraph 1.2; 17.2. The system shall include an air dryer with a heating element, an automatic condensate separator and an oil separator. The system shall be equipped with diagnostic connections (couplings) for inspection and maintenance; 17.3. A standard refuelling connection shall be provided at the front of the vehicle, under the windscreen, and at the rear of the vehicle; 17.4. The piping and valves of the pneumatic system must be protected against salt, ice and mechanical damage.
18.	Brakes	18.1. All brakes shall be of a disc type; 18.2. The vehicle shall be equipped with an Electronic Brakeforce Regulation system EBS or equivalent; 18.3. The main parking brake on the drive axle shall be operated mechanically by a lever from the driver's cab. The parking brake shall

		ensure that the trolleybus is able to stand stationary for a continuous period of time, without time limitation, on the maximum permissible ascent or descent; 18.4. The trolleybus must use a combined braking system combining electric motor braking and air brakes, controlled by a single pedal.
19.	Driving system	19.1. System with an amplifier; 19.2. Steering wheel on the left-hand side; 19.3. Steering wheel position adjustable (height and longitudinal).
20.	Electrical system, batteries	20.1. The current receivers must be suitable for a Trolleybus with autonomous drive and must be automatically controlled from the driver's cab by push buttons; 20.2. The dashboard shall display the position of the available current receivers. The driver shall also be able to see the connection/disconnection of the automatic current collectors from the overhead contact line via a video camera. The image is transmitted to the on-board computer screen or another display at the driver's workstation; 20.3. In the event of a failure of the automatic control system of the current collectors, the possibility of autonomous operation of the trolleybus shall be provided; 20.4. The design of the current receivers and heads shall be adapted to the Vilnius City contact network. Trolleybus current receivers shall be made of aluminium or a special composite with an insulating material coating (yellow). They shall not project more than 1,200 mm beyond the length of the trolleybus; 20.5. The automatic control system of the current receivers shall ensure the safe locking of the receivers, protecting people, the trolleybus itself, other vehicles and the overhead line from sudden disconnection from the wires at any line height; 20.6. Trolleybus current receivers shall be equipped with ropes designed for trolleybuses with In-Motion charging system to allow safe manual replacement of carbon inserts; 20.7. The maximum deviation of the trolleybus from the axis of the overhead line shall not be less than 4.5 m; 20.8. The trolleybus shall be equipped with a control system for reversing the direction of the overhead contact line on the branches, i.e. separate buttons for left and right movements. The amperage shall be at least 80 A when the trolleybus is moving to the left and at least 40 A when moving to the right; 20.9. A space should be provided for radio control equipment for switches manufactured by ESKO, Spol. s r.o. The technical specifications of this control equipment can be found at: https://www.esko-praha.cz/produkt/dalkovy-vysilac-d8-8-vozidlo/; 20.10. The heads of the current collectors shall be designed so as not to interfere with overhead lines and the carbon inserts shall be applied without screws. The steel parts of the receiver bars shall be RAL 7035. The heads of the current collectors shall be of such a design that they do not become entangled in the overhead line and the carbon inserts shall be applied without screws. The steel parts of the rods of the current receivers shall be RAL 7035, the other component parts of the rods shall have a yellow end (the part of the current receivers between the receiver head and the steel part); 20.11. The LED light for the illumination of the receiver heads shall be operated by a push-button from the driver's position; 20.12. The trolleybus electrical equipment must ensure that the vehicle can continue to operate even if the voltage on the overhead contact line drops to 420 V; 20.13. When a trolleybus uses electricity from an overhead line, the electricity generated by the recuperation process is first fed to the electrical equipment of the trolleybus and then used to charge the traction battery; 20.14. When the Trolleybus moves in autonomous drive, the electricity generated by the regeneration process shall be first charged into the traction battery and then into the electrical equipment of the Trolleybus; 20.15. There shall be a function allowing the driver to switch off the

charging of the trolleybus traction battery from the driver's workstation using overhead line power. The activation of this function must be indicated on the driver's workstation display.
20.16. A function shall be provided to allow the Trolleybus to run when the overhead line is iced. This function must be activated by a button from the driver's seat. Activation of this function must be indicated by a light signal or information on the driver's workstation display. This function must allow the Trolleybus to run (without blocking) on an icy overhead contact line in the event of voltage fluctuations.
20.17. The overcurrent arrestor shall protect the trolleybus against lightning strikes on the overhead line or against high voltage line drops on the trolleybus overhead line;
20.18. The trolleybus must not interfere with radio frequency transmitters. It must be equipped with a filter to remove interference;
20.19. The 600DC/24DC (DC) SIC technology static converter shall be used to provide low voltage. The capacity of a static converter should exceed at least 10% of the total capacity of all energy consumers;
20.20. Primary voltage - 600 V DC +/-30 %;
20.21. Rated secondary voltage - 24 V DC;
20.22. Characteristics of the voltage converter (DC-AC) used to power the auxiliary motors:
• Output voltage - 3x 380 ÷ 400 V AC;

• Frequency - 50 Hz;

20.23. The trolleybus shall be equipped with a control device that continuously monitors the voltage difference between the trolleybus body and the ground (earth) potential;
20.24. All electrical circuits shall be protected by readily accessible automatic fuses with indication, except where it is not possible to install automatic fuses in electrical circuits due to technological or safety conditions. The fuse panel shall include a diagram and description of the fuses in Lithuanian;
20.25. All relays, control units, automatic fuses and other electrical equipment must be installed in easily accessible junction boxes. Junction boxes shall be waterproof and dustproof (IP65) and made of a material that protects against electric arc flash;
20.26. The design of the trolleybus must be adapted for automatic external washing;
20.27. All vehicles must have USB Type-C connectors for charging mobile phones.
20.28. USB Type-C nodes shall be positioned in proportion to the size of the vehicle. One USB Type-C node must contain two USB Type-C connectors;
20.29. The number of USB Type-C nodes for passenger sharing in the vehicle must be at least 20 and the locations of the USB nodes must be agreed with the Purchaser;
20.30 1 USB Type-C node at the driver's workstation;
20.31. In-vehicle and out-vehicle loudspeakers:
20.31.1. The vehicle must be equipped with external and internal loudspeakers;
20.31.2. In the passenger compartment, the audible information system shall have a volume of not less than 90 dB in proportion to the size of the vehicle;
20.31.3. The audible passenger information system shall be equipped with an automatic sound level control function which analyses and adapts in real time to the internal noise level of the vehicle, ensuring that the information announced is clearly audible at all points of the passenger's presence, regardless of the existing background noise level. The sound level shall not exceed 10 dB above the background noise level, which can be adjusted to ensure comfort and smooth reception of information;
20.31.4. The loudspeakers must be able to work in coordination with the e-ticketing system and/or the on-board passenger information system;
20.31.5. An external loudspeaker shall be installed at the passenger boarding / deboarding door. The external loudspeaker must work with outdoor conditions. The external loudspeaker shall be able to play a

		different sound from the internal loudspeaker in the passenger compartment at the same time (connected separately from the internal loudspeakers); 20.31.6. A microphone will need to be installed on the left side of the driver, activated with the left foot or hand. Microphone messages must take precedence over other messages; 20.31.7. Audible reversing and door-closing alarms shall be provided; 20.31.8. Audio announcements in the vehicle must be clearly and understandable to passengers (of adequate loudness). The audio file format must be MP3 at 320kbps/mono/44.1kHz; 20.31.9. The audible information system in the passenger compartment shall provide audible announcements and volume control; 20.31.10. The driver's workstation must be equipped with 1 (one) radio receiver; 20.31.11. The audio information system in the passenger compartment shall have at least 8 loudspeakers proportionally arranged. Speakers shall be mounted in the ceiling of the passenger compartment or on the inside of the upper side covers. The speakers shall be connected via an audio amplifier; 20.32. Electronic clock shall be provided at the driver's workstation; 20.33. Audible signals when reversing, closing doors, cornering lights and switching off current collectors - "no current" signals; 20.34. Electrical wiring for the connection of the e-ticketing equipment in accordance with a scheme agreed with the Purchaser.
21.	Traction battery	21.1. The traction battery shall be LTO, NMC or equivalent, designed for on-the-move charging technology; 21.2. The traction battery must have a capacity of at least 80% of the capacity of a new battery at the end of the warranty period and must be able to provide 20 km of continuous autonomous driving; 21.3. The assessment and determination of the actual electricity consumption of trolleybuses shall be carried out using the test methodology set out in Part VIII; 21.4. The traction battery shall be charged from the overhead line while the trolleybus is running (or connected to a powered overhead line). The duration of charging of the traction battery from the mains shall not exceed 5 minutes for each kilometre of autonomous range travelled using traction battery power; 21.5. When charging the traction battery from the overhead network when the Trolleybus is stationary, the amperage shall not exceed 150 A; 21.6. The traction battery shall be capable of being charged from a CCS2 connector with a capacity of at least 20 kW; 21.7. The traction battery shall not have a charge memory effect and shall be rechargeable at any battery charge level; 21.8. The traction battery shall be equipped with a monitoring diagnostic system (the number of charge cycles, battery parameters and faults shall be stored in memory and shall be accessible at all times to the Purchaser. If specialised equipment (hardware and software) is required, the Supplier shall provide it free of charge to the Purchaser, including a perpetual licence). The traction battery shall be equipped with a battery temperature early warning system. The temperature data of the traction battery parts shall be displayed to the driver, collected and stored in a memory that is always accessible to the Purchaser; 21.9. In the event of a traction battery failure, the Trolleybus must be able to be operated using overhead line power.
22.	Batteries	22.1. The Trolleybus shall be equipped with 2 12 V batteries in series to power the low voltage circuits and shall have the capacity to provide the amount of electricity required by the Trolleybus equipment; 22.2. Batteries must be installed in a retractable, corrosion-resistant case; 22.3. Gases that may escape from the batteries must not enter the passenger compartment.
23.	Central lubrication system	23.1. If the trolleybus trailer coupling has a bearing, the trailer coupling must be lubricated via an automatic central lubrication system. If there are more lubrication points on the chassis and suspension of the vehicle than the driveshaft, all points must be lubricated via an automatic

		central lubrication system. All individual assemblies must be lubricated via separate lubrication lines, with different lubricant doses. 23.2. The automatic central lubrication system shall be non-progressive, i.e. in the event of a lubrication system leak, the driver shall be immediately informed of a pressure drop in the system; 23.3. A record of system operation shall be provided in the system operation memory to allow diagnosis and review of historical system parameters, including pressure.
24.	Trolleybus speed	The vehicle must be equipped with a speed limiter with a maximum speed of 70 km/h.
25.	Bodywork	25.1. Thermal insulation of the body sides and roof in accordance with the climatic conditions indicated in paragraph 1.2 of the technical specification; 25.2. The anti-corrosion coating must ensure that the warranty obligations of the bodywork are met; 25.3. Wheel arches (domes) shall be made of stainless steel or equivalent material resistant to corrosion and salt impact; 25.4. The edges of the wheel arches shall be fitted with bristles to protect the outer surfaces of the body from wheel dirt; 25.5. The external side trim of the bodywork of vehicles shall be made up of individual replaceable trim panels.
26.	Air conditioning, heating, ventilation	26.1. The HVAC system shall be equipped with separate controls for the driver's workstation and passenger compartment; 26.2. The heating system of the vehicle shall be suitable for the climatic conditions specified in paragraph 1.2; 26.3. Vehicles shall have the following passenger compartment air temperature requirements: 26.3.1 During the period from 1 November to 31 March, the temperature in the passenger compartment of the vehicles shall be maintained at between 5º and 15ºC during the operation of the routes; 26.3.2 During the period from 1 April to 31 October, the temperature in the passenger compartment of the vehicles shall be maintained between 18º and 28ºC during the period of operation of the routes. The National Public Health Centre recommends that the temperature difference between the outside and inside temperature in public transport should not exceed 6º - 7ºC. 26.4. The heating, ventilation and air-conditioning system shall ensure that the driver's cab and passenger compartment window panes do not rust; 26.5. At least 2 mechanically or electrically operated roof hatches shall be fitted, if the design of the vehicle so permits; 26.6. The passenger compartment shall have at least 8 (eight) windows with lockable vents; 26.7. Adequate collection of fluorinated greenhouse gases must be ensured to prevent leakage and release of fluorinated greenhouse gases when the air conditioning system is dismantled; 26.8 The air-conditioning system shall use R407c or CO2 gas, the operation of the air-conditioning system shall be via a heat pump; 26.9. The heating, ventilation and air-conditioning system of the trolleybus must be fully electric.
27.	Noise level	27.1. The sound level emitted by vehicles must not exceed the following limits (according to Regulation (EU) No 540/2014 of the European Parliament and of the Council): 27.1.1. with an engine of 150 kW or more and 250 kW or more - 76 dB(A); 27.1.2. with an engine of at least 250 kW, 77 dB (A).
28.	Driver's workstation and seat	28.1. The main switches, indicator lights and messages on the driver's console must be marked with identification markings and/or inscriptions in Lithuanian; 28.2. The dashboard shall be equipped with a speedometer, an odometer and an electricity consumption meter; 28.3. The dashboard shall provide all the information the driver needs

to know about the technical status of the vehicle's systems;
28.4. Instrument scales shall be metric;
28.5 The vehicle shall be equipped with an alcohol interlock device which shall comply with the Lithuanian standard LST EN 50436-2:2014 (or equivalent) "Alcohol interlocks. Test methods and performance requirements. Part 1. Devices for drink-driving offender programmes (as amended and supplemented). The engine must not be started without the driver having been checked for sobriety by an alcohol breathalyser. The Purchaser must be able to disconnect the system using a special key or code;
28.6. Driver's seat on air suspension, height-adjustable, with armrest on the left side, adjustable backrest angle and distance from the steering wheel;
28.7. A sun visor shall be fitted at the front and on the left-hand side of the driver's workstation to protect the driver from sunlight;
28.8. The driver's workstation shall be provided with:
28.8.1. a 12 V and a 24 V socket;
28.8.2. Closed driver's bag compartment;
28.8.3. Adjustable lamp for reading and to illuminate the sheet holder for the route timetable;
28.8.4. An SOS button for the driver to register an accident. When the button is pressed, the incident shall be captured on video and the system shall send an alarm message to a location (IP) or multiple locations agreed with the Purchaser. The button must be used to record an accident in the vehicle’s compartment. The operator who receives the alert must be able to monitor the live image and sound from the CCTV camera(s) on the Trolleybus;
28.8.5. The "A lane" button, which allows the driver to record an accident or traffic offence in the "A" traffic lane. The button shall capture the event on video and the system shall automatically send a message from the camera in front of the vehicle to a location (IP) or multiple locations agreed with the Purchaser. The uploaded image shall contain metadata and the image shall display: date, time, GPS coordinates of the event and the garage number of the vehicle. The operator who receives the alert should be able to observe the image directly from the camera;
28.9. The driver's workstation shall be separated by a closed compartment accessed through the front leaf of the front door. The compartment partition must be fitted with a door with locks on both the driver's side and the passenger compartment side. The cab design shall include elements to enable the driver to communicate with passengers (e.g. a perforated part of the partition door glass). At least 60 % of the partition shall be made of transparent material. In the compartment, the driver shall be protected against glare from interior lighting;

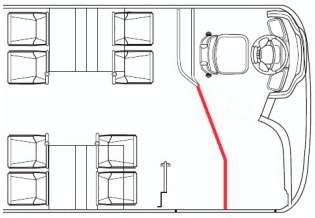


Figure 4: Diagram of the driver's cab partition.

28.10. The partition behind the driver shall be opaque, shall be fitted with a hanger for the driver's jacket, and shall have space on the other side of the partition for displaying information;
28.11. There shall be an opening window on the left-hand side of the driver's cab;
28.12. The driver's cab shall be equipped with a refrigerator for water or the driver's shift meal;
28.13. The driver's cab will need to have an additional fan. The fan shall have a diameter of at least 6 inches and shall be designed to allow adjustment of the direction of the airflow and the speed of the fan (at least 2 speeds);

		28.14. An A5 horizontal sheet holder shall be installed at the workstation, within the driver's field of vision, to hold the route timetable. The holder must be made of durable plastic, be easily accessible to the driver and ensure that the leaf does not fall out while driving. The mounting point should be chosen so that the holder does not obstruct the driver's view of the road or the use of the controls.
29.	Passenger seats	29.1. Individual passenger seats. The base of the seats shall be made of plastic. Padded seating shall be separable from the base; 29.2. Seats should be fixed to the wall (using a cantilever) (unless the design of the trolleybus does not allow it); 29.3. Seats must be resistant to wear, dirt and breakage; 29.4. Two folding single seats in the standing passengers' compartment next to the seat for the disabled; 29.5. At least 1 (one) wheelchair space for the disabled and/or persons with special needs shall be provided, including a belt, support (backrest) or other equipment to secure the wheelchair in front of the second door. The number of places will be agreed before signing the contract; 29.6. The upholstery fabric of the seats shall be ECO leather; 29.7. The seat upholstery fabric shall be resistant to folding in accordance with ISO 7854 method B for at least 400,000 folding cycles; 29.8. The manufacturer shall guarantee that the seat upholstery fabric will not wear out for at least 5 years; 29.9. The seating layout and colour scheme shall be agreed no later than 30 days from the date of signature of the contract.
30.	Security equipment	30.1. At least two 6 kg dry powder extinguishers shall be readily accessible and labelled; 30.2. Red reflective emergency triangle sign; 30.3. Two wheel supports; 30.4. Two first aid kits for road motor vehicles complying with the requirements of the Order No V-450 of the Minister of Health of the Republic of Lithuania of 11 July 2003 on the competence of healthcare and pharmacy professionals in first aid, first aid boxes and first aid kits; 30.5. All notices in the driver's cab must be in Lithuanian; 30.6. In the passenger compartment, a dispenser of gel hand sanitiser shall be mounted in front of each door, for public transport and supplied with power from the common electrical system of the trolleybus; 30.7. A Mobileye or equivalent collision avoidance system shall be fitted, always consisting of active frontal and blind spot sensors on both sides of the vehicle. The sensors must be based on image processing technology, monitor the dynamic driving environment and provide real-time visual and audible warnings to drivers. The vehicle shall be equipped with in-vehicle displays to visually warn the driver when a pedestrian, cyclist, motorcyclist, scooter rider, etc., appears in the danger zone on the side of the moving vehicle (the front sensor shall additionally be able to detect the risk of collision with cars or other vehicles). If the risk of collision increases, an audible signal shall be activated in addition to the visual signal; the audible signal shall be louder when a collision is imminent. The system must analyse the objects to minimise false reports. It must not record passengers entering or leaving the vehicle; 30.8. The traction motor and voltage converter compartments shall be equipped with an automatic fire-extinguishing system and the traction battery compartments with a fire suppression system.
31.	Glass	31.1. The windscreen must be air-heated; 31.2. The front lightboard shall be located at the front of the trolleybus, at the top of the windscreen or above the windscreen; 31.3. The windows shall be made of safety (toughened) glass and the side and rear windows of the passenger compartment shall be double glazed; 31.4. Door glass shall cover at least 50% of the door area; 31.5. Window panes shall be tinted and glued to the bodywork; 31.6. Trolleybuses shall have a light transmittance of at least 70 per cent in the front 180° of the driver's field of vision. The light

		transmission of the passenger compartment glazing will need to be between 50 and 70 per cent, with the final figure to be agreed before the contract is signed. 31.7. The first (driver's) door must be double-glazed; 31.8. The driver's left-hand window must be double-glazed or electrically heated.
32.	Emergency exits	32.1. Emergency exits shall be marked "Emergency exit"; 32.2. No rear window glass shall be provided for emergency exit; 32.3. Hammers to break the glass shall be attached at the emergency exit.
33.	Interior lighting/exterior lighting, lights	33.1. The passenger compartment lighting shall be LED technology, operating in two modes, one of which shall be energy-saving. It shall be possible to partially or fully illuminate the passenger compartment; 33.2. Separate lighting shall be provided for the driver's workstation (cab); 33.3. Passenger compartment lamps shall be so arranged as to provide adequate illumination of the passenger compartment and doors during the hours of darkness without dazzling the driver; 33.4. Interior entrance step lighting shall be provided at the passenger boarding / deboarding door. The lights must automatically switch on when the door is opened and off when it is closed. 33.5. All external lighting on the trolleybus shall be LED.
34.	Railings	34.1. The passenger compartment shall be fitted with tubular handrails painted in a bright colour, colour code RAL1016; 34.2. The horizontal handrails shall be fitted with plastic hanging brackets (at least 14 pieces) capable of accommodating a double-sided printed advertisement of 90×170 mm (or 85×125 mm). The advertising surface of the holders shall be oriented along the passenger compartment so as not to obstruct the driver's view; 34.3. Each door shall be equipped with "STOP" buttons on both vertical handrails. Pressing one of the buttons gives the driver information on the dashboard and a light signal informs the passenger.
35.	Labelling	All signage and information in the passenger compartment shall be provided in Lithuanian and English (Annex 2 to the Technical Specification). The place of the signs and information shall be agreed before signing the contract.
36.	Floor	36.1. The floor shall be covered with a non-slip, easy-to-clean PVC coating for public transport, which shall be resistant to abrasion, fire, chemical cleaning agents and weather conditions: 36.1.1. A total thickness of not less than 2.2 mm; 36.1.2. Abrasive wear thickness not less than 1.2 mm; 36.1.3. Residual indentation (according to EN 433 or equivalent) not exceeding 0.1 mm; 36.1.4. Colour fastness (according to EN ISO 105 BO2 or equivalent) not less than 6; 36.1.5. Resistance to chemicals (according to EN 423 or equivalent standard) - very good, unchanged; 36.1.6. Slipperiness (according to DIN 51130 or equivalent standard) not less than R10; 36.1.7. Flammability class (according to ECE R118/3 or equivalent standard) not less than Bfl - S1; 36.1.8. Coating solid fillers (e.g. silicon carbide) shall be present throughout the wear layer of the product and not just on the surface. 36.2. The colour and pattern of the PVC covering shall be practical to hide dirt. The colour must be agreed within 30 days of the date of signature of the Contract; 36.3. The edges of the PVC coating on the compartment walls shall be raised (lifted) at least 100 mm from the floor; 36.4. Passenger boarding / deboarding steps and the intersections of floor surface height differences shall be marked with bright contrasting signs; 36.5. The floor of the vehicle's cabin shall be fitted with blind warning

		and guidance surfaces. These surfaces shall guide the blind person from the door to the nearest e-ticketing system ticket scanner (validator) and seating. The installation and layout of the surfaces shall be agreed within 30 days from the date of signature of the Contract; 36.6. The lifetime of the floor covering shall not be less than 12 years (144 months) while maintaining the required performance.
37.	Rear-view mirrors	37.1. Rectangular rear-view mirror inside, at the front. Inside the compartment, the displays (monitors) must not obstruct the view, i.e. the driver must be able to see the parking spaces of the occupants in front of all doors; 37.2. Mirror eye or equivalent lateral observation system shall be provided on the exterior.
38.	Towing device	Towing devices shall be mounted in the lower part of the bodywork at the front and rear of the vehicle. The towing loop may be removable, but must be supplied with each vehicle. The towing device or the point of attachment of the loop shall be covered by a hood or cover.
39.	Exterior painting, compartment interior	39.1. The design of the trolleybus paintwork shall be agreed within 30 days of signing the Contract. 39.2. The paint used for the exterior painting of vehicles shall be resistant to daily brushing. The Participant shall specify the types of advertising film that could be applied to the painted surfaces; 39.3. Emblems and lettering shall be affixed with stickers or painted (to be determined when finalising the external appearance); 39.4. The interior surfaces of the passenger compartment shall be made of materials (plastic, aluminium, etc.) resistant to wet cleaning (using chemical cleaning agents).
40.	Vehicle systems on-board computer	40.1. The on-board systems computer shall record and store technical data on the operation of the vehicle, such as: distance travelled, average and maximum speed, sudden braking and acceleration, energy consumption, opening/closing of doors, switching on/off of the heating system (the additional on-board computer(s) performing these functions may be from other manufacturers); 40.2. The ability to remotely connect to on-board computer systems and monitor: 40.2.1. Trolleybus traction system parameters - 24 V circuit voltage, traction motor voltage or power and consumption, amount of recuperation energy produced, brake resistor voltage or power, total energy consumption, auxiliary motor operation, air-conditioning pump/compressor operation, heating system operation, accelerator pedal position; 40.2.2. Parameters of the trolleybus chassis system, including brake pad wear, brake pedal position and vehicle speed; 40.2.3. traction battery parameters - charge and approximate remaining mileage in km, acceptable energy recovery, temperature and charging capacity, failure events; 40.2.4. the temperature of the passenger compartment and the outside temperature and the values set by the vehicle's climate control system; 40.3. the ability to receive remotely notifications of failures and malfunctions of the vehicle systems listed in paragraphs 40.2.1, 40.2.2 and 40.2.3 of these Rules.
41.	Passenger counting system	41.1. Requirements for automatic passenger counting system equipment: 41.1.1. All vehicles must be equipped with an automatic passenger counting system; 41.1.2. The automatic passenger counting system shall be installed at all passenger boarding / deboarding doors of the vehicle; 41.1.3. The automatic passenger counting system shall provide data on the number of boarding and alighting passengers at each stop; 41.1.4. The accuracy of the automatic passenger counting system equipment must be at least 95%; 41.1.5. The automatic passenger counting system must include sensors for measuring passengers (e.g. People Counting Unit (PCU)) and on-board computers; 41.2. The automatic passenger flow measurement equipment of the

		passenger counting system shall: 41.2.1. Capturing public transport passenger flow data (see Raw data), linking them to a specific place, time, vehicle and vehicle door; 41.2.2. Have a positioning system (GPS, Galileo or equivalent) function installed to detect and record the coordinates of the vehicle's position and the time at which they are recorded; 41.2.3. Ensure the security of the data collected; 41.2.4. The Automatic Passenger Counting Technical Equipment (APC TE) shall be able to function reliably and continuously during the operation of the service; 41.2.5. In the APC TE, all connections and cables must be suitable for public transport. This means they must be resistant to vibration, environmental influences (dust, water, humidity and temperature). 41.3. Requirements for passenger measurement sensors (hereinafter - IR sensors): 41.3.1. IR sensors shall operate on the infrared principle (or equivalent) and shall be able to detect objects and the direction of movement of objects by triangulation. Infrared rays that are invisible and harmless to the human eye should be used; 41.3.2. IRs shall be installed in the vehicle in openings in the vehicle's structures above the passenger boarding / deboarding doors and shall operate with the same quality of performance at the mounting height of the vehicles in use; 41.3.3. The number of IR sensors at each passenger boarding / deboarding doors shall be such as to ensure the accuracy specified in subparagraph 41.1.4; 41.3.4. The IR sensors shall be powered by the on-board computer of the APC TE and shall not use batteries; 41.3.5. Each vehicle shall be equipped with the number of APC TE required to cover the number of corresponding passenger boarding/deboarding doors. If more than one controller is deployed, they must operate in a hierarchical master-slave relationship. 41.4. Vehicles with APC TE should: 41.4.1. Generate a file of estimated passenger flows and other data (position, door closures, etc.) and transmit this data via GSM to an application server equipped with the Dilax Citisense software, which allows viewing and analysing the statistics obtained. Files must be in dlx, csv or xml format. The APC TE should be able to retain at least 2 days' data in the event of communication failures; 41.4.2. Send data on the status and errors and failures of the components of the APC TE. The APC TE should be able to install firmware updates from a central system; 41.4.3. Have an integrated positioning system (GPS or Galileo or equivalent). The antenna of the positioning system unit shall be provided with the APC TE; 41.4.4. Have a data communication device on mobile GSM networks (4G or above), which must be equipped with a standard SIM card. The antenna of the GSM device shall be provided with the APC TE; 41.4.5. Be able to operate in Ethernet. It shall be possible to configure the on-board computer via a computer network (either connected to the network on-board the vehicle or remotely via a GSM data link) using a web-based user interface; 41.4.6. The APC TE should be installed and ready for operation, i.e. all the necessary wiring, cables and connectors to connect all components should be supplied and installed. All connections should be such that they cannot be connected incorrectly. Connectors and cables should comply with the environmental (dust, water, vibration) requirements for the equipment. 41.5. Requirements for the transmission of passenger flow data: 41.5.1. Passenger flow data should be transmitted to service stations equipped with APC IS, which allows viewing and analysing the statistics obtained; 41.5.2. Data shall be transmitted from the APC TE to the APC IS over a wireless IP network, e.g. GPRS or equivalent. For data transmission separate LANs should be created if the data is transmitted over a closed data network, and individual APNs or individual VPNs if the data is transmitted over public data networks;

		41.6. Requirements for the ATS TE: 41.6.1. Should be suitable for use in ambient temperatures ranging from -25° to +40° C; 41.6.2. The environmental protection rating should be not less than IP65 according to IEC 60529 or equivalent standard; 41.6.3. The vandal resistance rating should be at least IK08 according to IEC 62262, EN 50102 or equivalent; 41.6.4. It should comply with the requirements for shock and vibration resistance category 1, class B according to EN 61373 or equivalent; 41.6.5. The data recorded by the APC TE should be transmitted automatically at least every 24 hours; 41.6.6. It must be possible (if necessary) to access data in real time (at least every 30 seconds). The data and data formats that contain the passenger flow calculation information and are passed to the calculations must be open; 41.6.7. The ACS TE should ensure the receipt of data on the number of boarding and deboarding passengers (simultaneously) at each stop.
42.	Passenger Information System	42.1. Vehicles should be equipped with external and internal passenger information boards (displays); 42.2. The Passenger Information System shall be controlled by a controller located at the driver's workstation (cab), within easy reach of the driver without leaving the seat; 42.3. The billboards shall have a nominal rated power supply voltage of 24 V. 42.4. External billboards: panels using light-emitting diode technology (SMD LED or equivalent), where each point of the sign is an LED. The colour of the LEDs in the external passenger information billboards shall be RGB colour for the route number and monochromatic white or equivalent for the route direction. The external billboards shall have a minimum viewing angle of 110° and at least 5000 cd/m^2 luminance The billboards should be switched on at the same time as the on-board computer is switched on;  Figure 5: Example of an external billboard. 42.5. There shall be one external passenger information billboard at the front of the vehicle. The resolution of the part of the front billboard displaying the route number shall be at least 32x19 pixels and the resolution of the part of the front billboard displaying the route direction shall be at least 144x24 pixels. This billboard shall be sized to the maximum dimensions of the window or the cavity above the window; 42.6. Vehicles shall be equipped with 2 external passenger information billboards on the right-hand side. The resolution of the part of the side billboard showing the route number shall be at least 32x19 pixels and the resolution of the part of the side billboard showing the direction of the route shall be at least 144x24 pixels. This billboard shall be sized to the maximum dimensions of the window or the cavity above the window. The fixing points of the billboards will be agreed before the contract is signed; 42.7. There shall be one external billboard at the rear of the vehicle. The resolution of the rear billboard displaying the route number shall be at least 32x19 pixels and the resolution of the rear billboard displaying the route direction shall be at least 144x24 pixels. This billboard shall be sized to the maximum dimensions of the window or the cavity above the window. The route number must be displayed to the right of the route direction; 42.8. There shall be 1 external passenger information billboard on the left-hand side of the vehicle, displaying the route number, with a resolution of at least 32x19 pixels. This billboard shall be sized to the maximum dimensions of the window or the cavity above the window; 42.9. Vehicles shall be equipped with 5 internal passenger information

bilboards (displays) with an LCD TFT or equivalent technology screens with a diagonal of at least 29 inches. The exact locations of installation of the internal passenger information bilboards will be agreed before signing the contract;

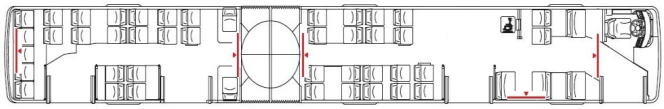


Figure 6: Diagram of the layout of the interior billboards.

Figure 7: Example of an internal billboard layout.

42.10. The internal billboards (displays) shall provide a digital interface to the external billboards. A resolution of at least 1920x610 pixels and an aspect ratio of at least 32:9 (UltraWide). The billboard shall be able to display two different images simultaneously. The fixing points will be agreed before the contract is signed. If the design of the trolleybus does not allow the installation of a 29" diagonal internal billboard at the rear of the trolleybus, 1 (one) of the 5 billboards shall be allowed to be installed with a diagonal of 18" or more, with a resolution of at least 1900x610 pixels, and a screen aspect ratio of at least 16:9;
42.11. Internal billboards shall have a minimum vertical viewing angle of 170° and a minimum horizontal viewing angle of 170°. The brightness of the internal billboards shall not be less than 500 cd/m2. The internal billboard shall be adapted to display a static image without the additional use of matrix burn-in reduction techniques. The screen coating shall be anti-glare;
42.12. The method of transmission of data updates (audio, route information, promotional videos displayed on internal billboard screens) shall be remote;
42.13. The passenger information system must be able to provide audio recordings of stops and other information relevant to passengers. The audio announcement of stops shall be synchronised with the display of visual information on internal passenger information displays. It must be possible to publish the name of the stop and other information related to the stop message (e.g. "Other",
"Next stop", "Last stop on the route", "Detour", "Park trip", etc.) It shall be possible for records of information (other than stops) to be announced at every given number of stops, and/or on a given route;
42.14. The billboard controller shall have at least one free Ethernet socket;
42.15. System self-diagnosis function;
42.16. Ways of updating data (audio, routing information, promotional videos shown on multimedia screens):
42.16.1. Wi-Fi in parks and GSM in the city;
42.16.2. Direct programming via a dedicated card or USB port on the front of the on-board computer.
42.17. The vehicle manufacturer can optionally integrate the billboards into the on-board e-ticket computer or connect them to the passenger information system controller;
42.18. The Passenger Information System should support the entry of information (routes, etc.) in the following ways:
42.18.1. GTFS format. The passenger information system should automatically process the information provided (read the file provided

		at the start of the trolleybus shift and generate the correct route number, direction, stop list and other information below for the specific vehicle assigned to the route) and display the correct information on the external and internal billboards (displays). The Passenger Information System shall keep track of changes in GTFS and other files provided and, if necessary, promptly update the displayed information throughout the bus shift. The driver shall be able to manually select the route number and direction; 42.18.2. Manually. This method should be used as a fall-back when, due to technical difficulties, GTFS files or other data are not available for the automatic processing and submission of information. 42.19. The vehicle's external front billboard must display the route number, the direction of the route, the type of journey (shortened, modified, detour, park, etc.) and, in certain directions, the symbol (e.g. for airport journeys, the aircraft symbol). The route number must be displayed in colour, according to the GTFS file or colour codes provided. The direction of the route should be shown in monochromatic white or an alternative solution should be provided; 42.20. The external billboard on the right-hand side of the vehicle shall show the route number, name and direction of the route, the nature of the journey (abbreviated, modified, detour, depot trip, etc.). The route number should be displayed in colour in the provided GTFS file or colour coded. The direction of the route shall be displayed in monochromatic white; 42.21. The vehicle's external rear billboard shall display the route number, direction, type of journey (shortened, modified, detour, depot trip, etc.) The route number shall be displayed in colour according to the GTFS file or colour codes provided by the Authorised Body. The direction of the route shall be displayed in monochromatic white or an alternative solution; 42.22. External passenger information billboards should have an option to display other information unrelated to the route number and direction, including ideograms (icons) such as "Happy Holidays" or "Happy Birthday, Vilnius". The information shall be displayed by changing it with the direction; 42.23. The size of the digit(s) of the route number displayed on the external billboards shall be at least 100 mm, the size of the letters and digits of the names of the starting and ending stops shall be at least 60 mm, and the size of the letters and digits of the intermediate stops shall be 35 mm. The inscriptions on the route arrows shall be in Lithuanian. If the route number is a combination of digit(s) and letter(s), the size of the letter(s) shall be at least 1/2 the size of the digit. 42.24. The following information shall be displayed on the interior light boards in the passenger compartment of the vehicle: 42.24.1. Vehicle route number; 42.24.2. The direction of the vehicle route; 42.24.3. The technical possibility of displaying the previous stop should be provided; 42.24.4. Nearest stop (highlighted in larger font); 42.24.5. Next stop; 42.24.6. Arrow - showing the sequence of stops; 42.24.7. Clock - showing the real time; 42.24.8. Static (pre-recorded or from a GTFS file) information about possible changes at the next stop; 42.24.9. Real-time information (obtained from the GTFS-RT file) about the departures of other routes from the future stop; 42.24.10. Real-time information (derived from the GTFS-RT file) on the time it will take a vehicle to approach certain stops; 42.24.11. Real-time (from a file provided by the Authorised Body or partners) information on traffic disruptions; 42.24.12. Configuration of transfer points before certain given stops (in png or equivalent format); 42.24.13. Larger diagonal billboards (29" and above) shall be able to display both two images at the same time (e.g. a small vertical route layout and the nearest stop departures or advertisements).

Figure 8: Information provided by the internal passenger information display design example

Figure 9: Example of the display image and information broadcast on the indoor passenger billboard

43.	Installation for the E-ticketing system	Vehicles should be equipped for the installation of the ticketing and tagging system used in the city. That is, the vehicle should be ready to connect to the e-ticket used in Vilnius in accordance with the diagram provided in III chapter of the Requirements. Final installation decisions should be agreed within 60 days of the signing of the contract.
44.	Requirements for internal and external camera equipment of the vehicle.	44.1. General requirements: 44.1.1. Cameras mounted on the exterior of the vehicle and in the interior of the vehicle shall be equipped with a sensor with a maximum image resolution of at least 6 megapixels, shall be designed to operate in a temperature range of -20 °C to +45 °C, shall be dust-proof, vibration-proof, and resistant to significant temperature variations, shall be rated not less than IP65, or equivalent, and shall comply with EN 55024, EN 61000-6-1, or equivalent standards; 44.1.2. The camera system should meet at least one of the following cyber security certifications: SySS, NDAA, Secure by Default, CNPP trust passport; 44.1.3. The lenses of the cameras should be selected so as to ensure a clear and high-quality image from all cameras (external and internal) in the vehicle; 44.1.4. The CCTV system shall be capable of recording video from all cameras, shall provide for automatic start of recording when the vehicle engine is started and shutdown of the system at a set time after the engine has been switched off, and shall be capable of storing a minimum of 200 hours of video footage on the storage medium of the device, with a resolution of not less than 1920x1080 and a minimum resolution of not less than 24 unique fps. The video material should be recorded on a medium without mechanical parts; 44.1.5. The Authorised Body should be able to view / export for viewing the video with at least Windows Media Player or VLC media player or equivalent video viewer; 44.1.6. The video recorder shall be free of moving parts, have a minimum of 200 hours of video recording memory, and use MxPEG or MJPEG or an equivalent code for encoding the video (so that the moving object is not blurred and is clear when the recording is stopped). 44.2. System of camera equipment for the passenger compartment (interior) of the vehicle.

		44.2.1. System of camera equipment for the passenger compartment (interior) of the vehicle shall consist of one camera at the driver's workstation (with the possibility to disconnect it from the entire system) and additional camera(s) to ensure that all passengers boarding / debording the vehicle are captured. Each video camera in the passenger compartment shall have a minimum 360° lens or an alternative solution to provide surveillance of the whole area of the vehicle compartment without a blind spot (obstruction of the passenger seat or handrail is not considered a blind spot), and shall have a viewing angle overlay to ensure the safety of the passengers, the other cameras, and the interior of the vehicle against vandalism. The installation points of the cameras should be agreed with the Purchaser; 44.2.2. A video camera capable of recording video with sound shall be installed in the passenger compartment of the vehicle at each passenger boarding / deboarding door. The driver-facing camera shall have the functionality to mute the sound. The positioning of the cameras shall ensure that the screen at the driver's workstation shows the passenger parking spaces of all doors. The positioning of the cameras shall also provide video surveillance at each passenger door in the passenger compartment. 44.3. System of camera equipment for the exterior of the vehicle. 44.3.1. One camera recording the view in front of the vehicle (outside) shall have a lens of at least 180° in order to provide a view of the traffic in the carriageway; 44.3.2. One camera capturing the image at the rear (outside) of the vehicle; 44.3.3. One camera on the right side of the vehicle (outside), providing video surveillance at each passenger boarding / deboarding door; 44.3.4. When the driver presses a button (e.g., SOS, "A lanes"), a part of the video from all the cameras in the vehicle would be flagged for automatic transmission according to the parameters set in the software (time interval in seconds before the button is pressed, and the time interval in seconds after the button is pressed), and the possibility to send to the software an alarm with a video of the event of at least 10 seconds duration.
45.	Facilities for managing, downloading and viewing video records	45.1. A unified hardware and software solution shall be developed for the automatic downloading and remote viewing of videos when a given vehicle is in the connection area, ensuring that a video of a predefined time and duration is automatically downloaded by the software; 45.2. When the driver presses the SOS button or the “A-lane” button, part of the video from all cameras in the vehicle shall be flagged for automatic transmission according to the parameters set in the software (time interval in seconds before the button is pressed, and time interval in seconds after the button is pressed), and it shall be possible to send to the software an alarm signal with a video of the event of at least 10 seconds duration; 45.3. Vehicles should be equipped with all the software necessary to process, transmit, store and view video recordings from the vehicles. The software provided shall be compatible with the Mobotix camera system used by the Purchaser in the vehicles purchased in 2018-2020. Data exchange protocols should be made available free of charge by registering on the manufacturer's website https://developer.mobotix.com/. If for any reason a Participant is unable to download the requested data from the address provided, the Purchaser may make the data exchange protocols for the equipment installed on the vehicles available to Participants who have registered for the Procurement and who so request; 45.4. During the warranty period of the vehicles, the licences should be provided that entitle the user to use the software and the functions described in the software installed in the vehicles, without limitation as to the number of workstations.
46.	Software for performance/fault monitoring	46.1. Vehicles should be equipped with a single software solution to monitor the operation of the internal CCTV cameras and the traffic video surveillance and recording system, as well as to automatically report faults and malfunctions. This part of the equipment shall provide automatic reports (including reports to the selected e-mail addresses) of failures of the system or its components from all vehicles;

		46.2. The Passenger Information System shall include software to create and update promotional videos or other information displayed on LCD screens, as well as to create, upload and update route information (notes) in the vehicles. The software provided shall be compatible with the Luminator Technology Group (Mobitec) Passenger Information System and the LCD screens used in the vehicles purchased by the Purchaser in 2018-2020. The data exchange protocols shall be made available free of charge by registering on the manufacturer's website: https://luminator.com/en-uk/service/request-information.html. If for any reason the Supplier is unable to register at the address indicated or does not receive the requested data, the Purchaser may make available the data exchange protocols of the equipment installed on the Purchaser's vehicles to Participants who have registered for the procurement procedure and who have requested it; 46.3. The software for monitoring the operation / faults of the internal video cameras and the traffic video surveillance and recording system and for automatic downloading of video recordings shall be compatible with the Mobotix camera surveillance/monitoring system used in the vehicles purchased by the Purchaser in 2018-2020. The data exchange protocols to be provided shall be available free of charge on the manufacturer's website at: https://developer.mobotix.com/. If for any reason a Participant is unable to download the requested data to the address indicated, the Purchaser may make available the data exchange protocols of the equipment installed on the Purchaser's vehicles to the Participants who have registered for the procurement procedure and who have requested it; 46.4. During the warranty period of the vehicles, licences entitling the user to use the software and all its functions installed in the vehicles, without limitation as to the number of workstations, should be presented.
47.	Wi-Fi internet connection should be provided for passengers in the vehicle.	47.1. The Wi-Fi device (router) should be installed in the vehicle in such a way that it is protected and out of the reach of passengers; 47.2. Internet access in the passenger compartment of the vehicle cabin should be available to all devices with a WiFi interface; 47.3. The Wi-Fi device (router)should be suitable for use in a vehicle (transport), i.e. it should withstand an operating temperature of -20°C to +45°C, a humidity of 90% and voltage fluctuations; 47.4. The in-vehicle Wi-Fi internet connection device must: 47.4.1. ensure a download speed of at least 100 Mbps and an upload speed of at least 50 Mbps; 47.4.2. provide free access to Wi-Fi service to at least 110 passengers / users at a time; 47.4.3. support 802.11b/g/n or equivalent; 47.4.4. support 4G connectivity; 47.4.5. support an embedded SIM card from Lithuanian telecommunications operators.
48.	Other equipment	48.1. All vehicles should be fitted with equipment that records actual electricity consumption and the data should be accessible and readable remotely; 48.2. All vehicles should be fitted with ECO driving equipment that reads data remotely in accordance with the requirements of paragraph 40.1; 48.3. For data transmission and communication: GSM, GPS antennas should be installed on the outside of the vehicle. No more than 3 antennas could be installed; 48.4. Metal litter bins for public transport should be available and fixed at the driver's workstation and at each passenger entrance door; 48.5. Flag holders on the left and right side of the upper front section should be provided.
49.	"Anti-COVID"	49.1. A system for neutralising viruses, bacteria, fungi and other micro-organisms; 49.2. The system should be functioning during normal trolleybus operation; 49.3. The installed system should use the air circulation generated by the air conditioning and roof heating systems and no additional fans may be used to supply air to the compartment; 49.4. All air entering the cabin from the air conditioning system or roof

		heating should pass through the UV rays; 49.5. The system shall automatically select the operating power based on the operating conditions of the trolleybus, the total power of the air conditioning system and its instantaneous capacity; 49.6. The system should be free of filters that need to be replaced periodically, ensuring service safety without coming into contact with contaminated components; 49.7. The system must not emit noise; 49.8. The process of neutralising viruses, bacteria, fungi and other micro-organisms shall be based on UV radiation; 49.9. There shall be a diagnostic system to report malfunctions in the system; 49.10. If there is no air flow, the system must shut down; 49.11. The system shall have a manual shut-off device.

III. DESCRIPTION OF THE EXISTING E-TICKETING SYSTEM AND REQUIREMENTS FOR THE INSTALLATION AND FITTING OF E-TICKETING EQUIPMENT

1. Existing e-ticketing hardware and general requirements for installation and fitting

1. Once the Purchaser has confirmed that the vehicle complies with the requirements established for it, i.e. when the Purchaser has signed the Certificate of Conformity of a Trolleybus, the Supplier will be required to install the Electronic Ticketing Equipment (hereinafter - the Equipment) in the vehicle and to carry out the other works related to its installation and preparation before the handover of the vehicle to the Purchaser. The equipment will be supplied to the Supplier by the Purchaser. The Purchaser undertakes to deliver the Equipment to the Supplier on the same day on which it signs the vehicle inspection certificate. The Purchaser shall be responsible for the quality, completion and technical condition of the Equipment.

2. Examples of the principle installation diagram are given in Section 3 and the requirements for installation and mounting works are given in Section 2.

lo	Name	Description	Quantity, (pcs.)
.	Composition of E-ticketing equipment (hereinafter - the Equipment)	1.1. On-board computer; 1.2. E-ticket tablet (mounted at the driver's workstation); 1.3. E-ticket tablet holder; 1.4. GPS and GPRS antennas; 1.5. WI-FI antenna; 1.6. Electronic card readers with holders; 1.7. Uninterruptible power supply UPS; 1.8. Switchboard - to connect e-ticketing system devices; 1.9. Fuse box; 1.10. Installation cables (set).	1 1 1 1 1 4 1 1 1 1
.	Installation and Equipment mounting works	2.1. Connect the power supply to the points of the Equipment being mounted; 2.2. Carry out the wiring inside the vehicle to the points of the Equipment being mounted; 2.3. Install the holders and attach the equipment to them in the vehicle; 2.4. Perform the Equipment boot-up (connection to the E-ticket system) and check for errors; 2.5. Conduct the Equipment testing together with the CE.	

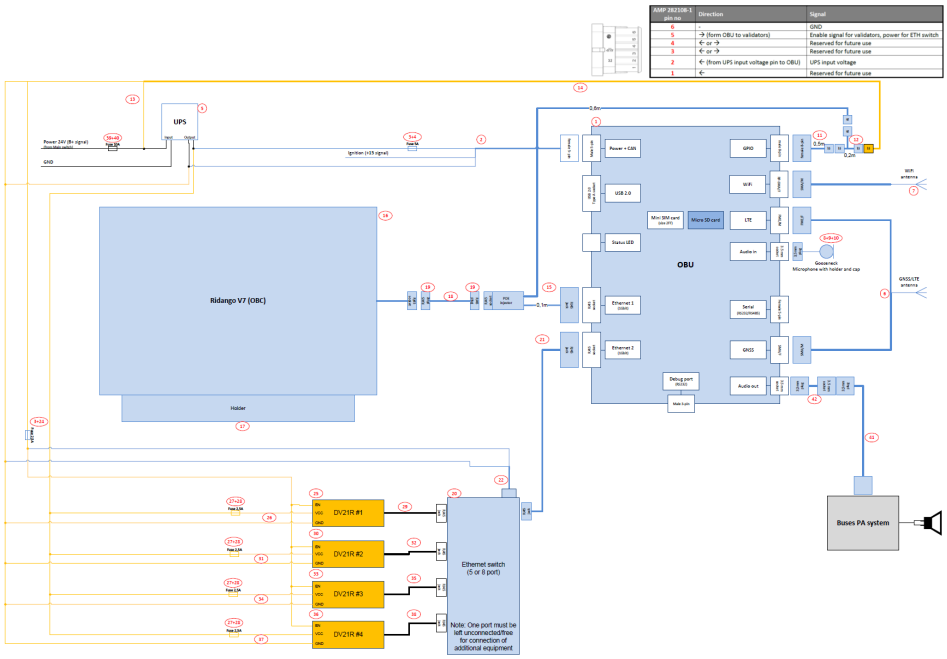
2. Requirements for installation works and mounting of the Equipment

The requirements provided shall only relate to the performance of the works referred to in paragraph 43 of the Technical Specification.

No	Equipment / means	Submitted by	Requirements for the Supplier
1.	On-board computer and switchboard	Purchaser	
2.	E-ticket tablet	Purchaser	Installation point to be agreed with the Purchaser.

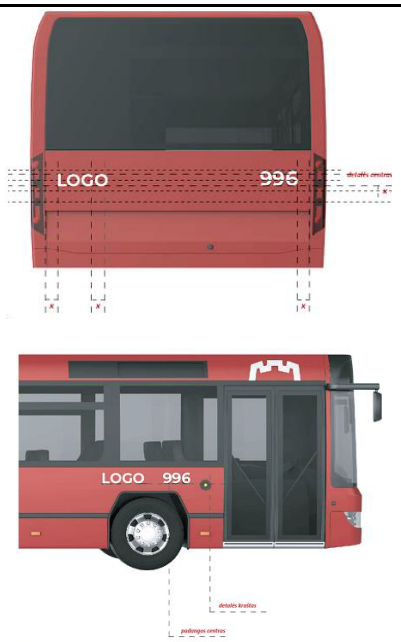
3.	GPS and GPRS antennas	Purchaser	
4.	WI-WI antenna	Purchaser	
5.	Uninterruptible power supply UPS	Purchaser	
6.	Electronic card reader with holder	Purchaser	Installation points to be greed with the Purchaser.
7.	On-board computer holder	Purchaser	
8.	Mobile data connection	Purchaser	One SIM card per vehicle (on-board computer) with activated mobile data service
9.	Power and other installation cables	Supplier	9.1. Rated power supply voltage 24 V DC (0.5 - 5 A); 9.2. Voltage stabiliser recommended.
10.	Vehicle operating environment	Supplier	The requirements are set out in Part II of the Technical Specification "Technical requirements for the vehicles to be purchased" paragraph 1.
11.	Preparation of the vehicle for the installation of the E-ticketing equipment and installation requirements	Supplier	11.1. The mounting space of at least 315 x 170 mm (length x width) for the E-ticket tablet (the driver must be able to reach the buttons of the on-board computer while behind the wheel); 11.2. The mounting point for the electronic card reader and the reader holder shall be provided next to the door where the passenger can comfortably hold the card and read the information on the reader screen; 11.3. All connection wires shall be installed and hidden. 11.4. On-board computer, uninterruptible power supply, GPS, GPRS and WI-FI antennas, fuse box - all in one place.
12.	Equipment installation works	Supplier	12.1. Installation works shall be carried out by the Supplier. The installation works shall be carried out at the location and according to the schedule agreed with the CE.
13.	Warranty	Supplier	The Supplier shall provide a warranty of not less than 60 months for the installation works and the installed components (wiring, connectors, other materials necessary for the proper functioning of the Equipment, excluding the Equipment itself).

3. Example of a principle installation diagram:
Tri-axle vehicle. The specific locations for the installation of the Equipment shall be agreed by the Supplier with the Purchaser.



IV. MANDATORY STICKERS AND INFORMATION HOLDERS

Table 1. Requirements for mandatory external and internal vehicle decoration/labelling:

Requirement for the vehicle's exterior decoration	Example of the vehicle's exterior decoration
1. At the rear of the vehicle (as shown in the example), through the centre of the rear part, on the sides (the end of the logo to the centre of the front tyre, the garage number to the edge of the part), the name of the haulier or the logo and the garage number of the vehicle should be provided.	
2. The Vilnius City logo shall be applied above the first (driver's) door. The centre of the castle in the logo shall be aligned with the centre of the front door and the top of the castle shall be aligned with the top edge of the screen.	

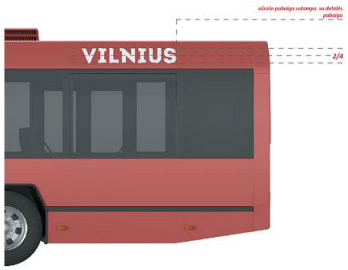
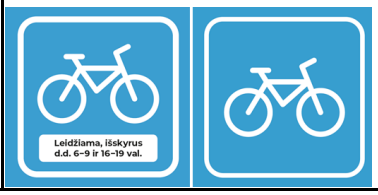
3. Vilnius city logo (VILNIUS). The end of the lettering of this logo shall be the same as the end of the vehicle part.	
4. The emergency opening mechanism shall be fitted with the sticker "Emergency door opening". - Sticker dimensions: e.g., 65x130mm. - Stickers shall be affixed on the outside of the vehicle to each door equipped with an emergency door opener. - The information on the sticker shall be provided in the Lithuanian and English languages.	
5. Important information on the vehicle's accessibility for all passengers and for passengers with disabilities shall be displayed at the middle door on the outside or, where there is a ramp, on the right hand side of the door. For instance, one sticker should be at least 75x75 mm. The following stickers shall be mandatory depending on the vehicle's specification: - Passenger with a child; - Disabled individuals; - Elderly; • Wi-Fi; - Bicycles; - Air conditioning;	 
6. Stickers marking the entrance to the vehicle (e.g., 75x75 mm): - 1 unit at he front door; - 1 unit at the middle door (on the left side of the door); - 2 units at all other doors (on both sides of the door).	
7. Stickers indicating the rules for transporting a bicycle (e.g., 75x75 mm) shall be affixed as follows: - 1 unit at the middle door (on the left side of the door); - 1 unit at the back door (right side of the door).	 

Table 2. Requirements for the interior decoration / labelling of the vehicle

Requirement for the vehicle's exterior decoration	Example of the vehicle's exterior decoration
1. Marking - indicating the place of keeping fire extinguishers. Marking shall not be smaller than, e.g., 130x130 mm.	
2. Marking - designating the capacity of public transport. V shall be no smaller than, e.g., 200x130 mm.	
3. Indicative marking - should not to disturb the driver in English and Lithuanian (diameter, e.g., 130 mm).	
4. Marking - indicating the place of the first aid kit on-board the vehicle (2 units): - one to be affixed in the driver's cab (size, e.g., 50x50 mm); - second on the driver's cab, on the passenger compartment side (size, e.g., 130x130 mm).	
5. Marking - designating the emergency exit shall be placed at each emergency door opener inside the vehicle, in English and Lithuanian (size, e.g., 65x130 mm).	
6. V - designating the emergency exit windows, double-sided sticker to be affixed on the emergency exit windows (image visible inside and outside the vehicle). The stickers shall be applied at the edge of the window at eye level and also on the vehicle's sunroofs (size, e.g., 127x127 mm).	

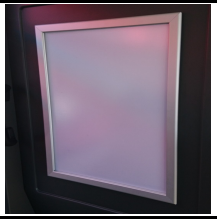
	
7. Information stickers - to mark the places for transportation of bicycles, for seniors, passengers with small children, disabled passengers and other special places for passengers. These stickers must be affixed close to specific places, in areas that are clearly visible to passengers (e.g., above the windows or on the landing below the window in Lithuanian and English (diameter, e.g., 130 mm).	 
8. Information stickers - indicating the opening windows: transparent stickers to be affixed to the opening vents inside the vehicle, the information on the stickers shall be in Lithuanian and English (e.g., 65x130 mm).	
9. Marking of the prohibited egress doors: a sticker to be affixed above the front door of the vehicle (size, e.g., 75x75 mm);	
10. Marking indicating permitted exit doors: to be affixed above all doors except the front door (size, e.g., 75x75 mm);	
11. Frame for changeable information behind the driver's cab (e.g. 480x670 mm).	

Table 3. The requirements apply to the internal decoration / marking of the vehicle.

Requirement for the vehicle's exterior decoration	Example of the vehicle's exterior decoration
1. 1 sticker (900x210 mm) shall be affixed in the passenger compartment of the public transport vehicle, in a conspicuous place (above the windows, at the doors of the first and second axle), indicating: Rules for the use of road passenger transport (or an extract thereof) and other information approved by Vilnius City Municipality: - the name and contact details of the carrier; - the name and contact details of the Authorised Body; - the name and contact details of the municipality that issued the authorisation to carry passengers on the public transport route; - the garage number of the vehicle; - ways and means of purchasing tickets; - the amount of the fine for travelling without a ticket; - other relevant information. 2. 1 sticker (900x210 mm) must be affixed in the passenger compartment of the public transport vehicle, in a place clearly visible to passengers (above the windows, at the doors of the first and second axle), indicating the municipality's approved rules for the use of the public passenger transport (or an extract thereof).	

V. PARTS USED IN THE TROLLEYBUS DESIGN WHICH COMPLY WITH THE LIST OF ARTICLE 92(13) OF THE REPUBLIC OF LITHUANIA LAW ON PUBLIC PROCUREMENT

Seq. No	Common Procurement Vocabulary code	Description
1.	30211XXX-X	Miscellaneous computer equipment
2.	30213XXX-X	Miscellaneous computers
4.	30215100-0	Microcomputer CPUs
5.	3023XXXX-X, except: 30231XXX-X 302331XX-X 302372XX-X 302373XX-X 302374XX-X	Miscellaneous computer-related equipment, except: various computer screens and consoles various memory devices various computer accessories various computer accessories, cassettes, tapes, audiotapes, discs various data entry accessories
7.	31712XXX-X	Various microelectronic machinery and apparatus and

		microsystems
10.	32323500-8	Video surveillance system
11.	32333200-8	Video cameras
12.	323442XX-X	Miscellaneous radio equipment and apparatus
13.	32352XXX-X	Antennas and reflectors, radio and radar spare parts and accessories
15.	3242XXXX-X	Miscellaneous network equipment
16.	32510000-1	Wireless telecommunications system
17.	3252XXX-X other than 32521000-1	Miscellaneous telecommunications equipment other than telecommunications cables
18.	32552410-4	Modems
19.	3512XXXX-X	Various monitoring and security systems and devices
20.	3811XXXX-X	Miscellaneous navigation devices
21.	38652120-7	Video projectors
22.	42961XXX-X	Miscellaneous command and control systems
23.	42965XXX-X	Miscellaneous information management and processing systems
24.	48XXXXXX-X	Miscellaneous software packages and information systems

VI. MANDATORY TECHNICAL REQUIREMENTS FOR WARRANTY

The trolleybus manufacturer guarantees that the styling, craftsmanship, condition and functionality of the trolleybuses supplied and of the material used is in conformity with the Technical Specifications in the tender and contract.

The trolleybus manufacturer must confirm the trolleybuses offered will be available for a minimum number of years of heavy urban transport operations (service life) as required in the warranty terms and conditions here below.

The trolleybus manufacturer guarantees that it bears responsibility for any damage to life, health and property of passengers, as well as of the Purchaser’s employees and third parties, caused by any technical or design defect in the trolleybuses supplied under the contract.

The trolleybus manufacturer shall be responsible for the total product and warranty and is not allowed to transfer this responsibility to sub suppliers / component suppliers, unless agreed with the Purchaser.

During the warranty periods, the Supplier must provide the mandatory Technical Servicing and Maintenance and Maintenance Repairs and the Warranty and Non-Warranty Repairs of the Trolleybuses at the Trolleybus Maintenance and Service Stations located at the Purchases premises (at Justiniškių str.14 and Žolyno str.15 in Vilnius)

The trolleybus manufacturer has to perform warranties for the supplied goods under the contract in accordance with the Clause 19 [Warranty] of the Particular Conditions of Contract. The Purchaser‘s stipulated Warranty requirements are mandatory.

The period of validity of the warranty for separate items shall be as follows:

VI.	Vehicle warranties	1. The warranty period starts from the date of signing the vehicle's acceptance certificate: 1.1. Parts, units and subassemblies shall be provided with a warranty of at least 60 months or until the trolleybus has covered at least 400,000 km, whichever comes first (the warranty does not apply to parts that wear out automatically, such as brake pads, brake disks, wiper brushes, contact pads, tyres, filters, fluids, oils, lubricants, LED lights, belts, carbon inserts); 1.2. For the interior covering, the bodywork warranty against breakage, deformation, corrosion, and the chassis against breakage or corrosion - at least 10 years (120 months) without mileage limitation; 1.3. Painted body surfaces shall be covered for a minimum of 60 months without mileage limitation; 1.4. The warranty period for electrical and electronic equipment shall be not less than 60 months or until the vehicle has covered at least 400 000 km, whichever comes first; 1.5. The traction battery shall be covered with at least 6 years’ warrantee. On the basis of calculations, it is expected that an autonomous mileage of the vehicle will be around 150,000 km during the warranty period. If the traction battery is depleted by more than 20% within the warranty period, it shall be replaced by a new battery; 2. The Participant should guarantee that spare parts will be available for a minimum period of 15 years from the date of signature of the transfer and

		acceptance certificate; 3. If 40% of the vehicles and/or their equipment fail repeatedly within the warranty period, the Supplier must rectify the faults and the causes of the faults in the remaining vehicles for which the warranties are still valid without waiting for the fault to occur in those vehicles; 4. During the warranty period, replaced parts shall be covered by a new warranty from the date of replacement until the end of the vehicle's warranty, but not less than 6 months.

6.1 The Participant warrants that the quality and specification of the Trolleybuses delivered under the Purchase Contract comply with the requirements for Class I passenger vehicles set out in United Nations Vehicle Regulation No 107, available at https://eur-lex.europa.eu/legal-content/LT/TXT/?uri=CELEX%3A42015X0618%2801%29.

6.2. The Participant warrants that the Trolleybuses comply with the requirements set out in Annex II "B" of Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019, including the requirements that will enter into force on 7 July 2026, which can be found at https://eur-lex.europa.eu/legal-content/lt/TXT/?uri=CELEX%3A32019R2144.

6.3. The Participant warrants that the Trolleybuses comply with the Technical Requirements for Motor Vehicles and their Trailers approved by Order No 2BE-260 of the Director of the Lithuanian Transport Safety Administration of 20 October 2022, as amended (TAR, 20/10/2022, No 21281; TAR, 06/04/2023, No 6693; TAR, 21/11/2023, No 22387).

6.4. The Participant shall submit to the Purchase together with the Trolleybuses copies of the Certificate of Conformity of the Vehicles and the EC type-approval certificate, of the certificate provided for in Annex IV to Regulation No 1060/2008/EC or in the relevant Annex to the individual Directive or Regulation, or of the national type-approval certificate (Certificate of Conformity), or of any other European standard, as well as of the Lithuanian standard transposing the European standard, or of the European standard or any other equivalent standard.

6.5. At the time of transfer of the Trolleybuses, the Supplier shall provide the Purchaser with a mandatory technical inspection card valid in the Republic of Lithuania for each of the Trolleybuses to be transferred, which shall be valid for at least ten (10) months from the date of the handover of the Trolleybuses to the Purchaser.

6.6. The Supplier warrants the quality of the Trolleybuses and the absence of latent defects. The quality of the trolleybuses must comply with the requirements set out in the technical specification, the terms and conditions of the Contract, as well as the models or descriptions of the trolleybuses to be purchased and the requirements of the documents determining their quality.

6.7. The Supplier shall provide the following warranties for the Trolleybuses under the Contract:

6.7.1. a warranty period of 60 (Sixty) months or 400,000 (Four Hundred Thousand) kilometres for parts, assemblies and sub-assemblies of the Trolleybuses, whichever is the earlier (the main Trolleybus Warranty Period). The warranty shall not apply to wear parts and materials of the Trolleybuses (as brake pads, brake disks, wiper brushes, contact pads, tyres, filters, fluids, oils, lubricants, LED lights, belts, carbon inserts);

6.7.2. a warranty period of 10 years (120 (One Hundred and Twenty) months) with no mileage limitation for the bodywork against breakage, deformation or corrosion, and the interior covering, chassis against breakage or corrosion;

6.7.3. a warranty period of 60 (Sixty) months with no mileage limitation for painted bodywork surfaces;

6.7.4 a warranty period of 60 (Sixty) months or 400,000 (Four Hundred Thousand) kilometres for the electrical and electronic equipment of the Trolleybuses, whichever is the earlier;

6.7.5. a warranty period of 6 (six) years for traction batteries of the Trolleybuses. The Trolleybuses are estimated to have an autonomous mileage of around 150,000 km during the traction battery warranty period. If the traction battery is depleted by more than 20 per cent within the warranty period, it shall be replaced by a new battery.

6.8. Traction Battery Warranty. The capacity of the traction battery shall be at least 80 per cent of the capacity of the new traction battery at the end of the warranty period and must be able to provide 20 km of continuous autonomous driving

6.9. The anti-corrosion coating of the Trolleybuses must ensure that the warranty obligations of the bodywork are met.

6.10. The Supplier shall guarantee that the seat upholstery fabric will not wear out for at least 5 years.

6.11. The warranty periods shall commence on the date of signing of the transfer-acceptance

certificate of the particular Trolleybus and shall continue until the expiry of the periods specified.

6.12. Spare parts replaced during the warranty period shall be covered by a new warranty from the date of replacement until the end of the Trolleybus warranty, but not less than 6 months.

6.13. In the event that the same defect recurs in forty (40) per cent of the Trolleybuses during the Trolleybus Warranty Period, such defects and their causes must be rectified in the remaining Trolleybuses without waiting for the defect to occur in them.

6.14. The Participant should guarantee that spare parts will be available for a minimum period of 15 years from the date of signing of the transfer-acceptance certificate of the last Trolleybus.

VII. DIAGNOSTIC AND MAINTENANCE EQUIPMENT FOR TROLLEYBUSES

The equipment and tools as listed below (including installation and commissioning, if necessary) shall be included in the tender price.

Instructions and manuals for the equipment and relevant software must be in English and Lithuanian languages.

List of required diagnostic equipment for the trolleybuses:

VII	Equipment	Quantity	Requirements
1.	Computers	6 (six)	1 . The Supplier shall provide with the first vehicles 6 (six) sets of shock-proof industrial diagnostic computers with software and performance modification programs for detailed vehicle diagnostics. The Purchaser should have access to all systems installed on the vehicles. If an industrial-grade diagnostic computer is offered for use, a laptop, should be supplied with all the necessary cables and connectors to connect it to the Trolleybus. The 15-inch computer should be supplied with a licensed operating system and a full set of licensed diagnostic software installed. Diagnostic computers should meet the following requirements: - a screen brightness of at least 400 nits; - a CPU score of at least 12000 according to CPUBenchmark.net; - At least 8 GB of DDR RAM 4; - Hard disk 500 GB SDD.
2.	Industrial tablets	6 (six)	6 (six) industrial tablets for mechanics with the necessary software to view historical data related to the maintenance and repair of a specific Trolleybus, to conveniently enter information on ongoing diagnostics, maintenance and repair, and to have access to comprehensive maintenance and repair manuals. Handheld industrial tablets should meet the following requirements: - The screen should be at least 10 inches in diameter; sunlight-readable, with at least 500 nits; - At least 4 GB of RAM; - At least Wi-Fi connectivity - IP 65 - Battery for at least 8 hours of continuous use - Operating temperature min -20°C, max +40°C.
3.	Wheel tightening tools	73 (seventy three)	The Supplier shall provide wheel tightening tools, 1 per trolleybus.

VIII. REQUIREMENTS FOR DOCUMENTATION TO BE PROVIDED BY THE SUPPLIER

The Supplier shall provide documentation as described below. The documentation shall be included in the tender price.

VIII	Technical documentation	8.1. Upon delivery and handover of the first trolleybus to the Purchaser under the Purchase Contract, the Supplier no later than within 3 (three) working days after the date of signing the Certificate of Conformity of a Trolleybus shall: 8.1.1. Provide detailed manuals in Lithuanian and English (2 copies) on electronic media for the maintenance and repair of Trolleybuses to enable qualified maintenance and repair of Trolleybuses (including the engine, axles and other assemblies), including maintenance and repair technology, schematics, drawings of component connections and other information; 8.1.2. Provide the Trolleybus diagnostic, repair and maintenance safety instructions (2 copies) on electronic media, if they were not provided together with the technical information; 8.1.3. Provide spare parts catalogues (2 copies) with images in English or Lithuanian, showing all spare parts of the Trolleybus by individual mechanism, component or system and identifying the serial numbers of these spare parts; 8.1.4. Provide legitimate online access to the Trolleybus manufacturer's electronic spare parts catalogue (4 access keys) or provide the Trolleybus manufacturer's electronic spare parts catalogues in electronic media, 2 copies; 8.1.5. Provide on electronic media general schematics of the Trolleybus electrical, pneumatic, mechanical systems and components, schematics of the individual units (2 copies), schematics of the units with detailed descriptions, values of the adjustable and controllable parameters, schematics for the control, repair and qualified maintenance of the whole Trolleybus and its components; 8.1.6. Provide on electronic media all the hardware and software necessary for the processing, transmission, storage and viewing of the videos (2 copies); 8.1.7. Provide detailed documentation (2 copies) of the hardware and software installed on the Trolleybuses, including the technical parameters of the equipment, in electronic media, in Lithuanian or English. The supplier shall provide configuration files that allow complete switching/reconfiguration of the equipment; 8.1.8. The supplier shall provide a brief user manual in English on an electronic medium, giving instructions for the normal use of the CCTV system and the passenger information system; 8.1.9. During the warranty period of the Trolleybuses, at least eight (8) required licences should be provided, which entitle the user to use the software and all its functions installed on the Trolleybuses; 8.1.10. Provide detailed instructions on electronic media describing the procedures for the safe and proper transportation of a defective trolleybus; 8.1.11. Detailed instructions describing the procedures for the safe and proper transportation of the defective trolleybus. 8.2. Each Trolleybus shall be provided with instructions for the driver in Lithuanian. 8.3. Technical documentation (schematics, electrical signals at control points, etc.) is available in Lithuanian or English; 8.4. Periodically update all technical documentation, including spare parts catalogues and diagnostic programmes, in accordance with the update intervals specified by the Trolleybus manufacturer;

IX. TRAINING

IX	Training	9.1. Upon delivery of the first trolleybuses under the Contract, the Supplier shall train at least 10 (ten) technicians (advanced repair technicians) at the premises of the Purchaser no later than 10 (ten) working days from the date of signing of the first handover and acceptance certificate. Training dates and schedules shall be agreed with the Contracting Entity. The training material shall be prepared in Lithuanian and distributed to all training participants. Upon successful completion of the training, the Supplier shall issue certificates to the trainees confirming completion of the training course and the competence of the staff to carry out maintenance work. The Supplier shall be required to provide additional training to a group of at least 10 (ten) technicians before expiry of the vehicle warranty. The date of the additional training shall be agreed between the two parties;

		9.2. The training programme should cover all systems installed on the Trolleybus. The training programme shall include: 9.2.1. Vehicle components and equipment (chassis, bodywork, high-voltage equipment, electronics, traction elements, hydraulics, pneumatics, etc.); 9.2.2. Operation principles and parameters of vehicle components; 9.2.3. Vehicle maintenance work; 9.2.4. Computer diagnostics of the vehicle - live parameters and settings, error scanning, calibration and programming options, etc; 9.2.5. Identification and rectification of potential faults (if known by the Supplier); 9.2.6. Components, maintenance and repair of additional vehicle equipment (video, audio, passenger counting and information, tyre pressure, fire-fighting and fire-extinguishing, disinfection, etc.); 9.2.7. A minimum of eight (8) hours of practical training per training group (arrangement of vehicle components, simulation of faults in electrical systems, fault finding and rectification); 9.2.8. Ten (10) technicians (advanced repair technicians) should be trained in the use of the spare parts catalogue and the correct selection of spare parts. They will need to be trained to read diagrams of electrical, hydraulic and pneumatic systems correctly. 9.3. If the technical solutions, programmes or software of the vehicles are changed during the warranty period, the Supplier shall provide additional training to 6 (six) technicians (higher qualified repair professionals); 9.4. The Supplier shall train at least 9 (nine) Trolleybus Driver Instructors of the Procuring Entity in the Safe and Efficient Driving Programme upon delivery of the first vehicles under the Contract. The dates and schedules of the training shall be agreed with the Contracting Entity. The Supplier shall provide methodological training material to all participants in the training, if necessary. The Supplier shall issue certificates to employees who successfully complete the training; 9.5. All training shall be in Lithuanian.

X. REQUIREMENTS RELATED TO SUPPLY OF SPARE PARTS AND CONSUMABLES

X.1. List of Goods

List No.	Name of Goods	Brief Description	Quantity
1.	Spare parts and consumables for Non-Warranty repairs and Maintenance repairs of the Trolleybuses	Spare parts, components and materials for the Non-warranty repairs and the Maintenance repairs of 73 Trolleybuses	1 set*
2.	Spare Parts and Consumables for the Technical Servicing and Maintenance of the Trolleybuses	Spare Parts and Consumables, required for the Technical Servicing and Maintenance of the Trolleybus in months 1 to 120 covering 800 000 km each during this period	73 sets*

* The Purchaser will purchase Spare parts and consumables for Non-Warranty Repairs and Maintenance repairs specified in Table X.2 based on the actual demand. For the avoidance of doubt these spare parts and consumables shall not constitute part of the scope of supply under this Contract. These spare parts and consumables will be purchased from the Supplier who will carry out these Non-Warranty Repairs and Maintenance repairs as stipulated in these Requirements. The Purchaser will have the right to replace in the Trolleybuses only the automatically wearing parts such as contact pads, carbon inserts, wiper blades, etc. and to refill the Trolleybuses with independently purchased window cleaning fluid according to the relevant season.

The Particpant shall provide prices for Spare parts, components, materials, and consumables required for Technical Servicing and Maintenance of the Trolleybuses and Non-Warranty and Maintenance repairs. Only these Spare parts, components, materials, and consumables required for Servicing, Maintenance and Repairs of Trolleybuses will be eligible use under the Separate Contract, as

described in chapter XI

The Supplier undertakes to use the Spare parts and consumables specified in Table X.2 for the Non-Waranty Repairs and Maintenance Repairs of the Trolleybuses and to use the Spare parts and consumables specified in Table X.3 for the Technical Servicing and Maintenance of the Trolleybuses at the prices (rates), excl. VAT, specified in its tender proposal, and to ensure that using these Spare parts and consumables for the Non-Waranty Repairs, Maintenance Repairs, and Technical Servicing and Maintenance of the Trolleybuses will not result in the loss of the warranty of the Trolleybuses.

The Prices of Spare parts, components, materials and consumables required for Technical Servicing and Maintenance, and Repairs of Trolleybuses will be revised (indexed) in line with the procedure established in the Particular Conditions of Contract.

Lists need to be presented by the Participant in its Tender:

X.2 Spare parts and consumables for Non-Warranty and Maintenance repairs of the Trolleybuses		
No	Description of spare parts and consumables	Qty (5 years)
1.	Set of front brake pads	550
2.	Set of rear brake pads	550
3.	Front brake disc	400
4.	Rear/middle brake disc	600
5.	Front brake caliper left and right full set	50
6.	Rear/middle brake caliper left and right full set	100
7.	Skids for collection head (summer type)	20 000
8.	Skids for collection head (winter type)	30 000
9.	Set of blades wipers	380
10.	Front tire	450
11.	Rear/middle tire	1 800
12.	Set of front glass	40
13.	Rear glass	15
14.	Front bumper set	15
15.	Rear bumper set	15
16.	Front left side section paneling set	5
17.	Front right side section paneling set	5
18.	Front central paneling or hatch set	5
19.	Front doors glass (left)	4
20.	Front door glass (right)	4
21.	Middle doors glass (left)	4
22.	Middle door glass (right)	4
23.	Rear doors glass (left)	4
24.	Rear door glass (right)	4
25.	Left side paneling until front wheel	4
26.	Left side paneling from front wheel until rear wheel	3
27.	Left side paneling from rear wheel until trolleybus end.	4
28.	Right side paneling from front door until middle door	4
29.	Right side paneling from middle door until rear	

	door	4
30.	Right side paneling from rear door until trolleybus end	4
31.	Left side hatches set	4
32.	Right side hatches set	5
33.	Rear hatches set	10
34.	Front door set (right side)	2
35.	Front door set (left side)	2
36.	Middle door set (right side)	2
37.	Middle door set (left side)	2
38.	Rear door set (right side)	2
39.	Rear door set (left side)	2
40.	Left side mirror eye set	5
41.	Right side mirror eye set	5
42.	Right side front headlights set	15
43.	Left side front headlights set	15
44.	Left side rear lights set	15
45.	Right side rear lights set	15
46.	Passenger seat material (ECO skin)	350 m²
47.	Collection heads	40
48.	Spare parts for collection head set (or separate parts, article to discuss)	100
49.	Rod for current collector	20
50.	Side marker light	100
51.	Brake pads wear sensor, front	300
52.	Brake pads wear sensor, rear/middle	500
53.	Set of side windows glass	5
54.	Roof unit separate modules set (article to discuss)	3
55.	Folding bellows set	2
56.	Coupling dampers set	2
57.	Coupling unit repair set	1
58.	Coupling unit control repair set	5
59.	Air conditioner maintenance tools set	2

X.3 Spare Parts and Consumables for the Technical Servicing and Maintenance of the Trolleybuses in months 1 to 120 covering 800 000 km each during this period [*1]

Item no.	Sequence and Name of technical service	Mileage or month of technical service, in km or months	Name of the part, component or material	Catalogue number	Units (e.g. pcs, liters, kg, etc.)	Quantity per trolleybus	Quantity for 73 Trolleybuses
1	[Name of the technical	*[X km or months]*	*[Material]*	*[catalogue number]*	*[specify units]*	*[specify quantity of*	*[specify quantity of*

	service]					*units]*	*units for 91 trolleybuses]*
1			*[Consumable]*	*[catalogue number]*	*[specify units]*	*[specify quantity of units]*	*[specify quantity of units for 73 trolleybuses]*
			[Part or material]	*[catalogue number]*	*[specify units]*	*[specify quantity of units]*	*[specify quantity of units for 73 trolleybuses]*
n	[Name of the technical service]	*[X km or months]*	*[Part or material]*	*[catalogue number]*	*[specify units]*	*[specify quantity of units]*	*[specify quantity of units for 73 trolleybuses]*
			[Consumable]	*[catalogue number]*	*[specify units]*	*[specify quantity of units]*	*[specify quantity of units for 73 trolleybuses]*
							[specify quantity of units for 73 trolleybuses]

Notes:

[*1]- Table X.3 Spare Parts and Consumables for the Technical Servicing and Maintenance of the Trolleybuses in months 1 to 120 covering 800 000 km each during this period, including all spare parts, components and materials for Technical Servicing and Maintenance of trolleybuses must be proposed and outlined in detail by the Tenderers in the table above, under the following conditions:

1. The complete list of the spare parts, components and materials must be inserted based on the instructions for the maintenance of the proposed trolleybus, indicating the mileage in kilometers for each technical service (maintenance) and / or frequency in time, indicating a clear number of months and/or mileage. (The Trolleybus Manufacturer's detailed instruction for Technical Servicing and Maintenance of the proposed trolleybus must be provided with the tender proposal).

2. Each technical service (maintenance) of a trolleybus must be separately presented in the table and must include a list of replaceable parts, components and materials during the Technical Servicing and Maintenance, indicating description (name), catalogue number, unit of measure and quantity.

3. The list of Spare parts and consumables for the Technical Servicing and Maintenance of trolleybuses shall be include the technical service of a proposed trolleybus for the mileage of 800 thousand kilometers and the operation of 10 (Ten) years each.

4. The price of Spare parts and materials for the Technical Servicing and Maintenance of trolleybuses (replacement parts, components and materials) for technical service within 10 (Ten) years and 800 000 (Eight Hundred Thousand) kilometers per trolleybus must be multiplied by 73 (seventy three) trolleybuses.

5. The Supplier shall deliver first batch of Spare parts and consumables for the Technical Servicing and Maintenance of trolleybuses as well as spare parts and consumables for Non-warranty and Maintenance repairs of trolleybuses to the Consignment Warehouse no later than the date of delivery of the first trolleybus.

XI. REQUIREMENTS RELATED TO CARRY OUT THE TECHNICAL SERVICING AND MAINTENANCE OF THE TROLLEYBUSES, AS WELL AS NON-WARRANTY AND MAINTENANCE REPAIRS OF THE TROLLEYBUSES

11.1. The Supplier shall carry out the Technical Servicing and Maintenance of the Trolleybuses as well as Warranty and Non-Warranty repairs and Maintenance repairs during the warranty period of the Trolleybuses. The additional contract for the Technical Servicing and Maintenance, Warranty and Non-Warranty repairs of the trolleybuses and the supply of Spare parts and consumables for the Trolleybuses shall be signed by the Purchaser and the Supplier.

11.2. The Supplier shall carry the , Warranty Repairs and Non-Warranty Repairs: the Technical Servicing and Maintenance of Trolleybuses and the Maintenance Repairs of Trolleybuses – at the Purchaser's production premises (Justiniškių str. 14 and Žolyno str. 15 in Vilnius, Lithuania) at the

Trolleybus Maintenance and Service Stations (hereinafter – the Trolleybus MS Station) installed by the Supplier at the Supplier's own expense, and the Trolleybus Warranty Repairs and Non-Warranty Repairs – Depending on the Supplier’s choice either at the Trolleybus MS Station, or at any other place agreed with the Purchaser.

11.3. The Supplier shall supply the Spare Parts, Service Parts and Consumables for the Technical Servicing and Maintenance, as well as Warranty and Non-Warranty Repairs and the Maintenance Repairs of Trolleybuses.

11.4. The Participant is required to submit with the tender a detailed description of the premises and equipment necessary for the performance of the contract. The description should include: characteristics of the premises, list of equipment, description of infrastructure.

Main requirements fot the Technical Servicing and Maintenance, and Repairs of trolleybuses during the warranty period:

XI.1	Technical Servicing and Maintenance *, repairs** (Warranty and Non-warranty).	11.1.1. Technical Servicing and Maintenance and Warranty repairs of trolleybuses during the warranty period: 11.1.1.1. During the warranty period, the Technical Servicing and Maintenance shall be provided at the Purchaser's production facilities. Faults shall be logged 24 hours a day, 7 days a week in the Purchaser's repair planning programme; 11.1.1.2. In the event of a breakdown of a trolleybus on the route, the Purchaser undertakes to evacuate the trolleybus to the workshop using a specialised towing vehicle. The Supplier must provide detailed instructions, together with the technical documentation, describing the procedures for the safe and proper transportation of the defective trolleybus. 11.1.1.3. During the warranty period, the supplier must provide the warranty repair services with its own resources and at its own cost. The Purchaser must not incur any costs for warranty repairs. 11.1.1.4. During the period of the vehicle warranties, the Supplier shall, in accordance with the trolleybus manufacturer's maintenance and servicing frequency (standards) and the content of all the maintenance and servicing required (the quantities and requirements of the maintenance and servicing works and of the materials and parts to be replaced, etc.), carry outthe maintenance and servicing of the trolleybusat the intervals and frequencies specified and in compliance with the standard working time indicated. 11.1.1.5. The Purchaser undertakes to notify the supplier (or the workshop indicated in its tender) of the need to carry out maintenance and servicing of the trolleybuses at the times specified in the technical documentation provided by the supplier (either according to the mileage of the trolleybuses or the lifetime of the trolleybuses) throughout the trolleybuses' warranty period. 11.1.1.6. The Supplier must carry out the maintenance and servicing of the trolleybuses and return the trolleybus to the Purchaser ready for operation within a maximum of 8 (eight) hours after the vehicle has been presented to the Supplier for maintenance. In exceptional cases where a longer period of time is required for maintenance and servicing work, it may be extended by agreement between the Parties to a reasonable period of time for the specific maintenance and servicing work to be carried out, which the Supplier must justify. The scheduled main period for maintenance and mandatory maintenance works shall be from 21.00 to 05.00. 11.1.2. Non-warranty repairs for trolleybuses during the period of warranties provided for trolleybuses: 11.1.2.1. The Supplier undertakes to repair, during the entire period of warranty for trolleybuses, the trolleybuses and their individual units, the various systems, the chassis, the bodywork and any other faults and damage not caused by the manufacturer or the Supplier and which are not recognised as a fault under the warranty (non-warranty repairs), at the place of the non-warranty repairs (workshop); 11.1.2.2. The Supplier shall carry out the non-warranty repairs of trolleybuses and return the trolleybus to the Purchaser ready for operation within 72 (seventy-two) hours (3 days) from the date of sending the notice of the fault to the Supplier, without counting that day, i.e. the time limit starting from the beginning of the following calendar day (00.00 hr). The Supplier may, after assessing the extent of the fault and determining that a longer period of time is required to

		remedy a particular fault, contact the Purchaser in writing and agree with the Purchaser a reasonable period of time, not exceeding 14 (fourteen) days from the date on which the notice of the fault was sent to the Supplier, not counting the day of the fault, to carry out the non-warranty repairs, which the Supplier must justify. In exceptional cases, where warranty repairs cannot be carried out within the time limits specified, the Parties may agree and fix a different time limit for non-warranty repairs by separate written agreement; 11.1.2.3. spare parts and other consumables for non-warranty repairs shall be provided by the Supplier on an as-needed basis. The time limits for non-warranty repairs shall not exceed the standard time set by the trolleybus manufacturer and/or the authorised vehicle repairer for such repairs; 11.1.2.4. Trolleybuses for which the supplier has performed non-warranty repairs shall continue to be covered by their factory warranties and, in addition, shall be covered by warranties of at least 6 months for the non-warranty repairs carried out and for the spare parts used for these repairs. 11.1.3. The Supplier undertakes to grant the Purchaser the right to carry out part of the daily maintenance of the trolleybuses. This work may include, but shall not be limited to: cleaning the exterior and interior of the vehicle, replacing contact lining and topping up consumables, changing tyres on the road. 11.1.4. The Supplier shall ensure that, when carrying out the Technical Servicing and Maintenanceand repair of trolleybuses and other services related to the Technical Servicing and Maintenanceand warranty repairs of trolleybuses, the availability of the trolleybuses at the time of the organisation of the operation is at least 96 %. ** Technical Servicing and Maintenance - means a set of technological measures and operations, carried out at intervals specified in the vehicle manufacturer's regulation or in accordance with the vehicle's performance units (mileage), aimed at maintaining the technical condition of the vehicle as specified by the vehicle manufacturer, including all servicing work, replacements of parts, technical liquids and materials, checks and adjustments of systems as specified in the vehicle manufacturer's regulation.* *** Repair means a set of technological measures and operations aimed at repairing a defective vehicle so that its technical condition is equivalent to the technical condition specified by the vehicle manufacturer. Repairs include fixing and replacing defective vehicle parts.*
XI.2	Trolleybus pick-up and return	11.2.1. For the Technical Servicing and Maintenance and Repair of trolleybuses and for other services related to the compulsory maintenance, warranty and non-warranty repair of trolleybuses, the supplier shall use the information provided by the Purchaser on the technical condition of the trolleybus. 11.2.2. The Supplier shall collect the trolleybuses for the Repair of the trolleybuses and other services related to the Repair not later than on the first working day of the workshop following the date of the Purchaser's notification of the need to Repair the trolleybuses and other services related to the Repair of the trolleybuses or on such other date as the Parties may agree. 11.2.3. The Supplier shall return the trolleybuses after having carried out Repairs or other services related to the Repair of the trolleybuses not later than the first working day of the workshop following the day on which the trolleybuses were Repaired or other services related to the Repair of the trolleybuses were carried out, or such other day as agreed between the parties. 11.2.4. In the case of Technical Servicing and Maintenance and Repair of trolleybuses and other services related to the Technical Servicing and Maintenance of trolleybuses, warranty and non-warranty repairs, the work carried out shall be recorded and made available to the Purchaser’s staff at any time. 11.2.5. Maintenance, warranty and non-warranty repairs of trolleybuses will be recorded in the Purchaser's repair planning programme. The Supplier will be provided with user logins to the system, which will record all work carried out and other information

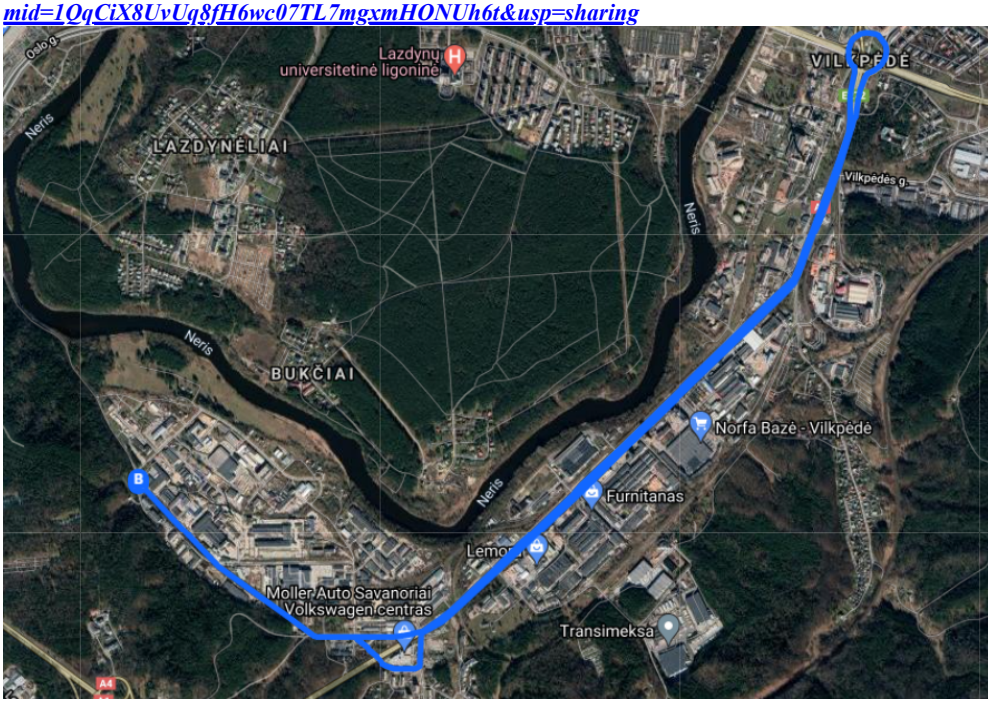
		related to the servicing, maintenance and Repair of the trolleybuses. 11.2.6. At the end of the term of the Technical Servicing and Maintenance the Supplier will carry out, together with the Purchaser, an assessment of the technical condition of the trolleybuses to determine their actual technical condition, taking into account the natural wear and tear. The Supplier will be required to remedy the identified deficiencies within a mutually agreed time limit.

XII. ESTIMATION AND DETERMINATION OF ACTUAL ELECTRICITY CONSUMPTION OF TROLLEYBUSES DURING TESTS

The Purchaser will hire an independent third party to participate, observe and confirm the accuracy of tests and testing process.

The actual electricity consumption of the Trolleybuses determined during tests and recorded in the test reports, will be converted into the actual average energy consumption of the Trolleybuses per 1 kilometre of mileage (to three decimal places) by calculating the actual average electricity consumption of the Trolleybuses per 1 kilometre of mileage determined during tests (hereinafter referred to as the "actual average energy consumption').

12.1. The electricity consumption of a trolleybus is defined as the total electricity consumption of all the equipment of the trolleybus.
12.2. 30 min before the consumption test trolleybus should be started and all the equipment switched on (passenger information systems (signboards, e-ticketing systems, passenger information displays), video surveillance systems inside and outside the trolleybus, Wi-Fi systems, passenger counting systems, heating). The traction battery should be fully charged.
12.3. During those 30 min (before the consumption test) heating system should warm up trolleybus passenger and driver's compartments at least up to temperature 18 °C. During the test heating system should be set to maintain inside temperature at least at 18 °C, or in case the temperature is not adjustable to keep certain passenger compartment temperature, it should be set to work at maximum performance.
Test runs will be carried out on the route indicated (link).
https://www.google.com/maps/d/edit?mid=1QqCiX8UvUq8fH6wc07TL7mgxmHONUh6t&usp=sharing



The terrain of the route can be assessed using topographic maps such as:
https://maps.vilnius.lt/bendrasis-planas#tools

12.4.Totally four (4) test runs (every test with a different trolleybus) will be carried out to assess the electricity consumption, (hereinafter referred to as the "tests'). The dates and times of the tests will be agreed by the Parties. Trolleybus drivers shall be assigned to the tests in equal shares of two (2) people from each Party, unless the Parties agree otherwise.

12.5. The Supplier's trolleybus driver(s) will be given the opportunity to perform up to 3 test runs prior to the tests to familiarise the Supplier's trolleybus driver(s) with the specifics and characteristics of the route.
12.6. The Supplier undertakes to train the Purchaser's trolleybus drivers in safe and economical driving before performing test runs by the Purchaser's trolleybus drivers.
12.7. Each test will be carried out with different, randomly selected trolleybus.
12.8. Test conditions:

a) the ambient temperature during the test may vary from 5 °C to 18 °C;

b) the road surface is asphalt. However, the tests shall not be carried out during rain or snowfall;

c) the trolleybus starts with fully charged traction batteries and travels at least 50 km in one test (at least five round trips on the test route);

d) tests will be carried out during off-peak hours (as agreed by the Parties. Peak hour are 7:00 – 9:00 and 16:00 – 19:00);

e) during the tests, the trolleybus will stop at all stops along the route and all passenger doors will be opened/closed. Doors will be opened for at least 10 seconds till the button "to close the door" is pressed;

f) tests will be carried out loaded with weight of 2500 kg distributed around the trolleybus to imitate passengers;

g) apart from the trolleybus driver, there will be a Purchaser's representative,the Supplier's representative and third party representative will be present on-board of the trolleybus during the tests;

h) test data will be read from the trolleybus on-board computer. A diagnostic computer can be used to read the data. In case of discrepancy between readings the readings of the trolleybus on-board computer will prevail and will be used for the comparison of actual electricity consumption of the trolleybus and the consumption of trolleybus declared by the Supplier in the tender proposal;

i) the test will be carried out with new tyres to the required pressure (checked before each test).

12.9. Test route data:

a) the round trip during the test on the the route is 11 (eleven) kilometres long (a single test run);

b) number of the overhead contact line switches: six (6) pcs;

c) number of automatic overhead contact line switches (manufacturer: ESKO, spol. sr.o., Czech Republic): six (6) pcs;

d) number of passenger stops: 21 (twenty one);

e) number of traffic lights controlled junctions: 12 (twelve).

The Supplier should take into account that number of items listed in points b) – e) here above may be reduced by one or increase by one item each.
12.10.The readings along with the results will be recorded in an electricity consumption report which shall be filled out immediately after each test and signed by all persons participating in the test. The report shall include:

12.10.1. the date and time of the test,
12.10.2. vehicle identification number,
12.10.3. complete information on actual test conditions stipulated in the sub-paragraph 12.8 of this part of Requirements, including the time of switching on all trolleybus equipment required to prepare vehicle for the test (must be at least 30 minutes), temperature of the passenger compartment at the height of 1.5 meter measured in the middle of passenger standing area at the middle door and set up regime of the heating equipment (must be at maximum or to maintain at least at 18 °C),
12.10.4. confirmation of the Test route data outlined in the sub-paragraph 8.9. here above, including:
a) actual trolleybus odometer readings before start of the test,
b) actual trolleybus odometer readings after the test,
c) the distance travelled during the test in kilometres (km) with a precision of two decimal places;
12.10.5. The readings of the trolleybus electricity consumption metering equipment:
a) the readings of electricity metering equipment not earlier than 30 seconds before the start of the test drive on the route and the exact time (including seconds) of recording the data,
b) the readings of electricity metering equipment not later than 30 seconds after the completion

of the round trip of the run on the test route and the exact time (including seconds) of recording the data,

c) the actual electricity consumption of the trolleybus during the test drive on the particular run, in kilowatt-hours (kW/h), with a precision of three decimal places;

12.10.6. The report shall include all details data and information required in this sub-paragraph 12.10 for each run separately.

12.11. The trolleybus electricity consumption data will be based on the electricity consumption protocol of the diagnostic equipment or data of the trolleybus on-board computer. In case of discrepancy between readings the readings of the trolleybus on-board computer will prevail and will be used for the comparison of actual electricity consumption of the trolleybus and the consumption of trolleybus declared by the Supplier in the tender proposal;

12.12. In case, one of the test conditions or record taking procedures described above are not met test should be repeated.

12.13. Only readings of the successful test drives compliant with conditions outlined above and requirements for testing and record taking will be taken into account.

12.14. Having the required number of successful tests (i.e. 10 single test runs by the Purchaser driver and 10 single test runs of the Supplier's driver) the recorded readings of only successful test runs will be taken into account.

12.15. To calculate the Actual Energy Consumption of trolleybus the sum of readings of the electricity consumed during the successful test runs will be divided by the sum of mileage on these successful test runs.

12.16. A summary report of the energy consumption tests will be prepared by the third party selected as an observer of the test. The summary report will be signed by the observer and representatives of the Purchaser and Supplier.

12.17. Tests can be carried out in any days of the week, including Saturdays and Sundays.

12.18. The Purchaser shall issue a notification of the planned test dates at least five (5) working days in advance of the envisaged tests.

12.19. In case the Supplier fails to delegate a representative or participate in the tests, the Purchaser has a right to carry out the required tests by himself and with his drivers complaining with the conditions of the test stipulated above. In such case of absence or failure to delegate a representative, the Supplier agrees that the third-party observer contracted to participate in the test, observe it and verify it, is fully replacing the Supplier, including but not limited to confirmation of the accuracy of tests and testing process.

Drawings

The Participant is required to provide drawings, plans, schedules and pictures of the proposed trolleybus with its Tender. The detailed drawings will be required prior to delivery during contract implementation.

The following shall be provided with the Tender Technical Documentation:

1. Dimensional drawings of the proposed Trolleybuses with principal dimensions and the proposed interior scheme.
2. Diagrams and drawings of the electrical and pneumatic systems installed in the Trolleybuses.
3. Description of the Trolleybus design with characteristics and parameters, diagrams and drawings.
4. Official manufacturer declarations.
5. A visual presentation of the proposed Trolleybuses and/or a link to the website where the visual presentation of the Trolleybuses can be found and viewed.
6. Documentation proving the periodicity of Trolleybus servicing and maintenance.
7. Documentation of the working time standards for service and maintenance operations.
8. Documentation proving the quantities of materials and parts required for servicing and maintenance work.
9. Content descriptions for Trolleybus servicing and maintenance.
10. The Supplier shall provide with the first Trolleybus copies of the Sertificate of Conformity to the requirements for Class I passenger vehicles set out in United Nations Vehicle Regulation No 107, the Sertificate of Conformity to the requirements set out in Annex II "B" of Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019, including the requirements that will enter into force on 7 July 2026, Certificate of Conformity with the Technical Requirements for Motor Vehicles and their Trailers approved by Order No 2BE-260 of the Director of the Lithuanian Transport Safety Administration of 20 October 2022, as amended (TAR, 20/10/2022, No 21281; TAR, 06/04/2023, No 6693; TAR, 21/11/2023, No 22387) and copies of the Certificate of Conformity and EC type approval of the Vehicles, the certificate of conformity and EC type approval, the certificate provided for in Annex IV to Regulation No 1060/2008/EC or in the relevant Annex to the individual Directive or Regulation, or the national type confirmation certificates (certificates of conformity) or other European standard certificates and certificates of the Lithuanian standard that succeeds the European standard, or of the European or other equivalent standards.