

TRA 23-01 - Supply and Delivery of School Buses - Quote Form - Bus Unit Price: Type C Electric

		Dynamic Specialty Vehicles	The Lion Electric Co	Western Canada IC Bus Inc.	First Truck Centre Vancouver
		Submission 1 Unit Price	Submission 1 Unit Price	Submission 1 Unit Price	Submission 1 Unit Price
Line Item	Bus Description				
1	76 passenger Type C Electric. All units and components must meet Federal and Provincial regulations and requirements and current D250.	\$518,090.00	\$440,000.00	\$447,000.00	\$468,850.00
2	70 passenger Type C Electric. All units and components must meet Federal and Provincial regulations and requirements and current D250.	\$517,431.00	\$440,000.00	\$446,200.00	\$464,250.00

TRA 23-01 - Supply and Delivery of School Buses - Quote Form - Option Pricing: Type C Electric

		Dynamic Specialty Vehicles			The Lion Electric Co			Western Canada IC Bus Inc.			First Truck Centre Vancouver		
		Submission 1			Submission 1			Submission 1			Submission 1		
Line Item	Optional Pricing	Charge Type	Unit Price	Additional Information	Charge Type	Unit Price	Additional Information	Charge Type	Unit Price	Additional Information	Charge Type	Unit Price	Additional Information
1	One (1) additional spare tire mounted	Additional	\$1,309.00	Ship loose	Additional	\$975.00		Additional	\$875.00		Additional	\$775.00	Shipped Loose
2	Air horn roof mounted	Additional	\$254.00		Not Available			Not Available			Additional	\$129.00	
3	Current Gatekeeper digital video system supplied and installed with 2 cameras	Additional	\$2,360.00		Additional	\$3,963.31	Please note the Gatekeeper digital video system come with three (3) cameras	Additional	\$2,350.00		Additional	\$2,400.00	Pricing for local installs
4	Current Seon digital video system supplied and installed with 2 cameras	Additional	\$2,360.00		Additional	\$4,745.00	Please note that the SEON digital system provided by Lion comes with three (3) cameras.	Additional	\$2,350.00		Additional	\$2,400.00	Pricing for local installs
5	Pre-wiring for 2-way radio and antenna power and ground thru noise suppression switch.	Additional	\$53.00	.	Additional	\$160.00	Pre-wiring to be visible on the plans that will be submitted upon the reception of the PO	Additional	\$150.00	*	No Charge	\$0.00	Included
6	Driver's storage compartment overhead left side	Additional	\$219.00		No Charge			Additional	\$250.00		No Charge		Standard option for TBB
7	Installed Zonar current GPS Tracking and Vehicle Diagnostics System with EVIR handheld device and all accessories. Include pricing for each handheld device available	Additional	\$850.00		Additional	\$1,014.00	We can install the Zonar GPS Tracking and Vehicle Diagnostics System however we would like to please recommend Lion's alternative option LionBeat. The LionBeat telematic software can be accessed via different electronic devices (i.e. cellphone tablet computer). Refer to p.17 of Lion - ASTSBC RSO TRA23-01 document uploaded with our proposal.	Additional	\$850.00	Bid Price is for V4 Tablet. Samsung Tablet with Locking Mount avail at 1800.00	Additional	\$1,000.00	Bid price for V4 GPS with EVIR kit. - Samsung Tablet Active3 kit available for addition charge
8	Zonar current Fleet GPS Tracking and Vehicle Diagnostics System Installed	Additional	\$615.00		Additional	\$599.99	The LionBeat is priced at 599.99/ per bus per year. Pricing for the Zonar current fleet GPS tracking is listed above at line 7 for a total of 1014.00.	Additional	\$525.00		Additional	\$550.00	Bid price for V4 GPS with EVIR kit. - Samsung Tablet Active3 kit available for addition charge
9	Driver's clipboard storage accessible from drivers seat	Additional	\$27.00		No Charge			No Charge			Not Available		
10	Traction control through ABS	No Charge	\$0.00		No Charge			No Charge			Not Available		Equipped with Wabco 4S/4M ABS with Hill Start Aid
11	Limited Slip Rear Axle	Not Available	\$0.00		Not Available			Not Available			Not Available		
12	Driver controlled differential lock	Additional	\$1,523.00		Not Available			Not Available			Additional	\$850.00	
13	Automatic Greasers Minimum 12 grease points	Additional	\$3,843.00		Not Available			Not Available			Additional	\$4,050.00	
14	Recommended Level 2 charging system for your bus	Additional	\$3,900.00	In-Charge Level 2 AC or Level 2 DC available with RFID. Price does not include software and activation fees. See Energy Services and Charging Stations.pdf for details on charging options and services.	Additional	\$5,995.00	Pricing of Flo CoRE+. Upon receipt of purchase order, the LionEnergy team will contact the school district to discuss the best charging solution for their needs. Depending on the school district's choice of charger, the price may vary. As an authorized reseller of several Level 2 and DCFC chargers, districts will have the option to review pricing from different companies.	Additional	\$15,000.00	DC 24KW 480V Charger.	Additional	\$13,100.00	Delta 25 kW charger - 13100 Proterra 60kW Charger (1 x CCS cable) - 52200 Various chargers available upon purchase TBB infrastructure team can do an assessment to confirm what charging options would be best for the districts needs
15	Acoustic ceiling panels throughout	Additional	\$908.00		Additional	\$1,295.00		No Charge			Additional	\$620.00	
16	10R22.5 Tires instead of base 11R22.5	No Charge	\$0.00		Not Available			Not Available			Not Available		
17	Interior mirror - 10" x 30" Mirror adjustable no windshield obstruction	Additional	\$35.00		No Charge			Additional	\$60.00		Not Available		8X30 Available for 35
18	Interior-Exterior intercom	Additional	\$71.00		Additional	\$450.00		Additional	\$100.00		Additional	\$95.00	
19	Emergency roof hatch vent with exhaust fan	Additional	\$1,112.00		No Charge			Additional	\$225.00		Additional	\$275.00	
20	Tinted Windows throughout	No Charge	\$0.00		No Charge			No Charge			No Charge		Included
21	Laptop and connectors with applicable programming and software including training for each style of bus purchased. ABS software.	Additional	\$3,000.00	Vantage software and ABS software included. Ford/Roush software included at no charge for Gas & Propane buses. Cummins software included (one per School District) Training included.	Not Available		Upon discussion with school district to tailored need.	Additional	\$2,500.00		Additional	\$4,200.00	
22	Wheelchair lift specify OEM in attached documentation. Supply and install wheelchair lift with one chair position across from lift inclusive of tie down system includes Ricon lift Qstraint tie down system and floor pockets for one chair	Additional	\$14,000.00		Additional	\$11,995.00	Wheelchair lift OEM is Braun	Additional	\$7,680.00		Additional	\$7,500.00	Braun Lift
23	Track seating per wheelchair space	Additional	\$1,565.00		Not Available		The LionC has pucks for securing wheelchairs.	Additional	\$1,050.00		Additional	\$840.00	
24	Air operated disc brakes	Additional	\$3,230.00		No Charge		This option is included in the base price to comply to ASTSBC base specification requirements	No Charge			Additional	\$1,650.00	
25	Integrated Child Seats/Per Seat - Attach information details	Additional	\$808.00		Additional	\$774.00		Additional	\$595.00		Additional	\$400.00	
26	Adjustable Foot Pedals	Additional	\$1,488.00		Not Available			Not Available			Additional	\$1,200.00	
27	Telescopic Steering	No Charge	\$0.00		No Charge			Additional	\$375.00		No Charge		Included
28	Hydraulic brake school bus with air seat and air suspension	Not Available	\$0.00		No Charge	-\$2,000.00	Included in base price	Not Available			Not Available		Air Brakes only
29	Hydraulic brake school bus (no air components)	Not Available	\$0.00		No Charge		ASTSBC clients that choose Hydraulic Brakes will be given an additional 2000 discount off the base price listed.	Not Available			Not Available		Air Brakes only
30	In-service training for chassis and body maintenance procedures at Purchaser's facility	Additional	\$2,500.00		No Charge			Additional	\$800.00		No Charge		Zone training for technicians provided free of charge - individual on site training 850
31	Interior mirror 8 X 30 inches adjustable no windshield blockage	Not Available	\$0.00		Not Available			Not Available			Additional	\$35.00	

32 Door handle on exterior of entry door	No Charge	\$0.00	Included in the base bus price. Option: Ruggedized exterior entry door handle	No Charge	No Charge	No Charge	No Charge	Included
33 Move to one body size larger with same seat count for increased knee room	Additional	\$841.00		Not Available	Additional	\$850.00	Additional	\$4,150.00
34 Pedestrian Detection System	Additional	\$2,450.00	Mobileye System	Not Available	Not Available		Not Available	
35 Stop Arm Camera	Additional	\$450.00	Seon camera only. 2 Camera Seon Stop Arm 1000. Gatekeeper Stop Arm Camera + License Reader 1085	Additional	\$3,548.00	Bid Price is for Seon Stop Arm Cam Gatekeeper Stop Arm Cam with License Plate Reader is 950.00	Additional	\$1,100.00
								Gatekeeper - Stop arm camera with license plate reader 1100
36 Power and Range upgrade / downgrade - Price for each range option available	Additional	-\$18,600.00	Downgrade 155 kWh Battery	No Charge	-\$30,000.00	Clients interested in purchasing the 168 kWh option, with a range of 200 km can expect to take delivery of these buses from 3 to 6 months after receipt of purchase order. The 168 kWh option will be discounted by \$30,000 from the bus unit bid price for a total of \$410,000 per vehicle.	Not Available	Seon stop arm camera only 1748
						Delivery of the LionC 210 kWh option, with a range of 250 km will take place in Q1 of 2024.		
37 First Light Safety Products FULLY ILLUMINATED STOP ARM Air Drive	Additional	\$1,961.00		Not Available	Additional	\$1,050.00	Additional	\$1,650.00
38 First Light Safety Products FULLY ILLUMINATED STOP ARM Electric Drive	Additional	\$1,961.00		Not Available	Additional	\$1,250.00	Additional	\$2,250.00
39 First Light Safety Products ILLUMINATED SCHOOL BUS SIGN	Additional	\$1,200.00	Factory installed illuminated sign equivalent at 1200. Aftermarket installation of First Light Safety Product Illuminated School Bus Sign 2286	Not Available	Additional	\$1,500.00	Not Available	

TRA 23-01 - Supply and Delivery of School Buses - Specification - Base Bus Specifications: Body - Type C Electric

		Dynamic Specialty Vehicles		The Lion Electric Co		Western Canada IC Bus Inc.		First Truck Centre Vancouver	
		Submission 1		Submission 1		Submission 1		Submission 1	
Line Item	Body Specifications	Yes/No	Additional Information	Yes/No	Additional Information	Yes/No	Additional Information	Yes/No	Additional Information
1	Four (4) additional power supply feeds at body power source.	Yes		No	The LionC has two (2) additional power supply feeds at body power source.	Yes		Yes	
2	Crossing arm deactivation switch	Yes		Yes		Yes		Yes	
3	Full power steering - minimum 18" diameter steering wheel Tilt steering column telescopic	Yes		Yes		Yes		Yes	
4	HORNS Dual electric	Yes		Yes		Yes		Yes	
5	Instruments: Dash mounted hr meter Battery Monitor speedometer in kmh c/w odometer in km Range (2) air pressure gauges if air equipped	Yes		Yes	Lion is compliant with this specification for clients choosing air brakes for their vehicles.	Yes		Yes	We do not have Range in the dash EV dash is similar to existing diesel with addition of SOC Gauge
6	Low air warning - light and buzzer	Yes		Yes	Lion is compliant with this specification for clients choosing air brakes for their vehicles.	Yes		Yes	
7	School buses must be equipped with heating units and be able to sustain 15.5 degrees C (plus or minus 2 degrees) inside the vehicle when the outside temperature is 0 degrees C ambient. Heaters should not decrease vehicle range by more than one percent. Please describe achievable in vehicle temperature when outside temperature is -30C and provide the expected impact of heating the interior cabin temperate on vehicle range especially when outside temperature conditions are very cold.	Yes	Reaching and sustaining 15.5 degrees C (+/- 2 degrees) inside the vehicle when the temperature is 0 is not a problem. Further testing is required to provide the achievable in-vehicle temperature when the outside temp is -30C.  The battery thermal management system typically uses less than 10% of usable power to maintain operating conditions. This does not account for cabin heat loads. When cabin heat is activated cabin heat will consume 6% - 20% of usable power.	Yes	Lion offers an 80000 BTU fuel heater from common brands. The fuel fire heater emits on average 2238 pounds of CO2 per year (considering that the tank would be refilled about 4 times in extreme weather conditions) and the auxiliary tank contains 25 gallons of fuel. The auxiliary system does not draw any range from the battery. No kW used during operation; No draw on battery range; Pre-heat setting to heat the cabin while plugged in using the energy from the grid; 25 gallons tank; Refuel will depend on climate (average 4x per winter).  Lion also offers an electric heater option that is currently being used by all the Lion electric school buses in California.  Consumption of 4-6 kW per hour; Pre-heat setting to heat the cabin while plugged in using the energy from the grid (also available with the auxiliary option); Pre-cool setting not available because the AC system is very efficient and cools down the vehicle much faster than the heating system does.	Yes	Dual heating system included: electric and fuel fired. Both systems will operate on a closed loop. The electric heater (21kW) sustains heat between 18c to 23c (defined as comfort) down to -10C (14F) ambient temperature. In temperatures below -10C the fuel-fired heater will maintain comfort. Operation of heating systems has been taken into consideration in our range statement. The fuel fired heating system is used below -10C and to maintain maximum range.	Yes	Yes standard heaters can meet the desired temp but not without more than -1% effect on Range. We have 2 electric coolant heater 10kW for the batteries and 20kW for the cabin area
8	Vendors should describe their proposed heating systems including fuel source and flexibility to accommodate different fuel types as requested by local school district. "The use of electric heaters to pre-heat the vehicle cabin is not preferred; however using electric heat to keep the batteries warm is acceptable. Vendors should also describe their proposed system for pre-heating vehicle cabins.	Yes	The Thermal Management System consists of three electric heaters of which one is dedicated to heating the propulsion batteries and two are dedicated to cabin heat. As a supplement to the electric heaters there is an optional Valeo diesel-fired heater that can provide additional heat for the cabin. The electric heaters and/or the fuel-fired heater are capable of pre-heating the cabin while the bus is charging. While the bus is charging the driver can turn on the cabin heaters while performing pre-check which will use power from the charger to run the electric heaters and not affect the battery charge. With a valeo heater the timer can be set on the EV no different than a diesel engine to pre-heat the cabin.  The Valeo diesel-fired heater is included in the base price of the bus.	Yes	The heating system on the Lion school buses was designed as a system where the heater can begin warming the passenger cabin before the bus even begins its daily routes. This works by allowing the unit to start while the electric school bus is still connected into the charging station. Thus it heats up the school bus without draining any energy from the batteries because the energy being used to heat the bus is being drawn directly from the charging station. Using this “preheat” method as we call it means that the system can increase the interior bus temperature and maintain it at 21 degrees C during roll-out regardless of what temperature the passenger cabin started at. We have many electric school buses deployed in areas where winter weather regularly goes below freezing. However with our preheat ability our school buses can be warm and comfortable on the inside regardless of outside temperatures are below freezing (or lower). The preheat process can even be scheduled to occur automatically at determined times during selected days. This means that an operator can pre-set the unit to start warming up while charging even hours before the driver even boards. This way there is no wait time between the driver engaging the preheat system (remotely/automatically) and the school bus being warm enough and ready for roll-out. The school bus will already be maintaining a steady comfortable temperature by the time the driver boards. Our unique and innovative preheat ability contributes to the quality of our electric buses and helps drivers and end users have a comfortable riding experience. We are happy to provide additional information on the performance of our heating systems and preheat abilities upon request. ASTSBC are welcome to test the heating and preheat systems before delivery. However Lion can also leverage auxiliary diesel-powered heaters as mentioned before. Lion offers an 80000 BTU fuel heater from common brands such as Pro-heat and Spheros. The fuel fire heater emits on average 2238 pounds of CO2 per year (considering that the tank would be refilled about 4 times in extreme weather conditions) and the auxiliary tank contains approximately 25 gallons of fuel. The auxiliary system does not draw any range from the battery. No kW used during operation; No draw on battery range; Pre-heat setting to heat the cabin while plugged in using the energy from the grid; 25 gallons tank; Refuel will depend on climate (average 4x per winter)	Yes	When vehicle is not in use during cold temperatures it is recommended to keep battery temp above 0C by keeping the vehicle plugged in. When vehicle is in use the vehicle BMS will control temperature. There are no additional maintenance or operational requirements.	Yes	Our vehicles are designed for zero emissions. 2 Electric heaters are used to provide heat for the battery system and cabin area. Standard under-seat heater are used to heat cabin - we do not offer an auxiliary diesel heater for our electric bus
9	LIGHTS: Front headlights: HD All exterior lights to be LED Cluster lights: front and rear - six (6) in total LED 8 light system non-sequential with master switch	Yes		Yes		Yes		Yes	

10	Body insulation including walls ceiling and roof bows - to be fiberglass or equivalent Dust intrusion package on underside of bus up to floor joint	Yes		Yes	Yes	Yes
11	WINDSHIELD Laminated safety glass tinted Please state what is offered.	Yes		Yes Laminated glass not tinted.	Yes 3-Piece Flat	Yes Tinted safety glass 1-peice curved & bonded windshield provided for best in class visibility clear of any seams. With the largest visibility footprint on the market our windshield eliminates any potential blind spots that may be found with a 3 or 4 piece windshield. Ensuring children are always seen and safe.
12	WINDOWS Passenger windows split sash type tinted throughout. Thermal where required Driver's window sliding type thermal pane lockable Emergency windows evenly spaced.	Yes		Yes Up to four (4) thermos windows. Windows are 26% tinted and are all tempered glass.	Yes	Yes
13	Exterior Lettering Six Inch - (Purchaser name) both sides at belt line	Yes		Yes Lion will apply lettering at its St-Jerome (QC) manufacturing factory or its Richmond (BC) experience center during the bus' PDI.	Yes	Yes As required by district
14	Four Inch - Bus Number two front corners and opposite rear license plate	Yes		Yes Lion can work with ASTSBC preferred lettering vendor and can apply them before delivery.	Yes	Yes As required by district
15	Two Inch - Capacity GVW (Purchaser name) on side panel back of entrance door and side panel below driver.	Yes		Yes Lion can work with ASTSBC preferred lettering vendor and can apply them before delivery.	Yes	Yes
16	Floor 5/8 plywood subfloor or equivalent secured with screws only (no nails) water proofed and sealed at joints with silicone sealer including floor to wall seams; floor covering and entry steps	Yes		Yes Lion offers equivalent 3/4 plywood subfloor.	Yes	Yes We use screws only
17	Vandal lock for Emergency and Entrance Doors	Yes		Yes	Yes	Yes
18	Heavy duty entrance door control - air or electric operated Entrance Door must be outward opening	Yes		Yes	Yes	Yes Air and Electric entrance door controls available
19	Two (2) auxiliary 6" electric defroster fans Separate switches on panel	Yes		Yes	Yes	Yes One windshield mounted and one above driver's window
20	Driver's dome light on separate switch.	Yes		Yes	Yes	Yes LED Driver's dome
21	Rear dome lights on separate switches ( with dimmers if available )	Yes		Yes	Yes	Yes Front & rear half of dome lights on separate switches (no dimmers available with LED dome lights)
22	AM/FM CD RADIO W/PA Flush mounted speakers to match bus	Yes		Yes	Yes	Yes
23	Driver's seat to be deluxe high back air seat fully adjustable - 6-way with lumbar support and fold down arm rests. Air foam rubber filled with heavy duty covering cloth fabric	Yes		Yes	Yes	Yes
24	EMERGENCY EQUIPMENT COMPARTMENT Above windshield; all emergency equipment to meet standards	Yes		Yes	Yes	Yes FAK & Fire extinguisher in overhead compartment Triangles on vestibule floor
25	Mud flaps front Mud flaps rear with rubber fender skirts	Yes		No The front mud flap are not required on a LionC as the rear body of the front wheels is protecting from potential splashes. The LionC has no rear rubber fender skirts.	Yes	Yes
26	MIRRORS (EXTERIOR) Right and left side primary and convex mirrors; remote adjustable Exterior convex crossovers self-defrosting mounted on right and left sides of hood	Yes		Yes	Yes	Yes
27	Two (2) LED stop arms with strobe lights (red) air operated one (1) front mounted (1) rear mounted. Both with wind guards	Yes		No The LionC has an electric operated stop arm.	Yes	Yes
28	Wet arm windshield wipers intermittent / delay preferred	Yes		Yes	Yes	Yes
29	Light coloured rubber floor covering and entrance steps. Specify colour.	Yes	Grey floor.	Yes Dark Grey or White are available on the LionC.	Yes	Yes Grey colour flooring
30	Seat spacing minimum 24" knee clearance Frame seat belt ready	Yes		Yes	Yes	Yes
31	Aluminized side panelling	Yes		Yes Lion leverages Composite Body Panels Gelcoat no corrosion & no water leaks rendering more durable than aluminum and accepted as an equivalent.	Yes	Yes Galvalume interior side walls
32	77" minimum interior headroom at highest point. Please state Headroom	Yes	77"	Yes 78"	Yes 78"	Yes 78" Headroom standard
33	Interior mirror - minimum 6" up to 10" x 30" Sun visor - Plexiglas 6" x 30"	Yes		Yes	Yes	Yes 6 x 30 inch mirror provided
34	Two (2) roof emergency hatches / vents	Yes		Yes	Yes	Yes
35	Right side luggage compartment 84" preferred Specify largest size available based on body size	No	Not available on Electric Bus	No Not available	No	No Not available
36	Body fully undercoated for noise and enhanced rust protection	Yes	Asphalt emulsion undercoating included.  Option: Premium Undercoat Sulfonate Enhanced DTM Modified Wax coating. Replaces the standard asphalt emulsion. Provides approx twice the performance in highly corrosive environments where de-icing chemicals are prevalent.	Yes Lion fully undercoats its body. Please note that an all-electric school bus is noiseless. Please note that the plywood flooring is installed above an aluminum extrusion therefor fully rust protected.	Yes Water Based Asphalt Emulsion installed post body-drop is included. Chemguard metal treatment is available optionally.	Yes Asphalt emulsion undercoating standard full under coating For maximum corrosion resistance Corashield high performance undercoating is available at an additional cost. This durable wax based self-healing formula guards against moisture and abrasions from road debris
37	Each unit shall be equipped with a Sound Generator that complies with FMVSS and CMVSS 141	Yes		Yes	Yes	Yes

TRA 23-01 - Supply and Delivery of School Buses - Specification - Base Bus Specifications: Chassis - Type C Electric

	Dynamic Specialty Vehicles		The Lion Electric Co		Western Canada IC Bus Inc.		First Truck Centre Vancouver	
	Submission 1		Submission 1		Submission 1		Submission 1	
Line Item	Yes/No	Additional Information	Yes/No	Additional Information	Yes/No	Additional Information	Yes/No	Additional Information
1 Chassis and Body Year	Yes	Blue Bird 2024	Yes	LionC 2025	Yes	2024 International	Yes	Thomas Built Bus 2024
2 Propulsion system - vehicle performance include: A sustained speed of 70 kph on a 2.5% grade; and 20 kph on a 20% grade. An ability to accelerate to 20 kilometers per hour (kph) in four seconds; to 40 kph in 10 seconds; 50 kph in 20 seconds and 70 kph in 35 seconds. Expectations are that the school bus shall be cable of a minimum of 200 kilometer range on a single battery charge on route measured with 50% city miles and 50% highway miles. Vehicles should be capable of operating at minus 30 degrees Celsius (-30C) to 35C with limited loss of range (no more than 10% reduction of documented range) in these variable conditions. This range rating must be tested with all normal accessories running in the conditions described including terrain encountered in BC.	Yes	A sustained speed of 70 kph on a 2.5% grade: YES A sustained speed of 20 kph on a 20% grade: YES An ability to accelerate to 20 kilometers per hour (kph) in four seconds: YES An ability to accelerate to 40 kph in 10 seconds: YES An ability to accelerate to 50 kph in 20 seconds: YES An ability to accelerate to 70 kph in 35 seconds: YES Driving habits duty cycle vehicle weight and accessory load conditions can affect this number. The bus has not been tested with all normal accessories running in the conditions described including terrain encountered in BC. Operating temperatures are recommended to be within -30 – 68 degrees Celsius. The battery thermal management system typically uses less than 10% of usable power to maintain operating conditions. This does not account for cabin heat loads. When maximum cabin heat is activated the system will consume approximately 6% - 20% of usable power. In cold climates it is recommended to have the bus plugged in to a Level 3 DC Fast Charge system to maintain battery temperatures prior to starting routes. In cold climates it is also recommended to store the bus in a climate-controlled building prior to starting routes.	Yes	As detailed in our Lion - ASTSBC RSO TRA23-01 Lion has delivered all-electric school buses throughout North America in a wide range of different climates and different types of roads. Range of the vehicles acceleration and consumption of energy are greatly affected by driving behaviors and use of accessories. Clients must follow operations guidelines and normal usage of accessories recommended by the manufacturer to optimize range and a normal usage of accessories.	Yes		Yes	
3 Describe vehicle performance while fully loaded in terms of maximum operating speed grade-ability and acceleration. Please provide documentation of for verifying submitted vehicle performance claims to meet above performance specifications.	Yes	See gradeability and acceleration information attached: Gradeability and Acceleration Data.pdf	Yes	Certification to be supplied upon award	Yes	Range: 200km in bid stated conditions. Acceleration: All acceleration times will comply with bid stated conditions. Max Speed: 100km/h 20% grade 0-100km/h in <40 sec Peak Power: 250kW (335 hp) Continuous Power 160 kW (215 hp) Peak Torque: 15700Nm (11570 ft-lbs) Continuous Torque: 2100Nm (1549 ft-lbs) See Attachment.	Yes	Our range is up to 134 miles (215km). This is dependent upon driver terrain HVAC. TBB has not validated vehicle performance to the described requirements
4 Vehicles should have the ability to change the powertrain deferential ratio to maximize range performance in mountain routes city routes highway routes or a combination of mountain city and highway routes. Please describe your process for achieving this?	No	Blue Bird has chosen to use the 5.29 single rear axle ratio as a great compromise for the typical school bus stop and go route whether that is in mountain routes city routes highway routes or any combination of the regional operations. Since Blue Bird School Buses do not use a transmission or a two-speed rear axle we not only keep the overall weight of the school bus lower we do not encounter the additional losses of efficiency that the vehicle would have with the added weight of a transmission. If a transmission and two speed rear axle were to be used it would contribute to a greater loss of efficiency.	Yes	Lion's electric motor is direct drive there is no transmission. Lion partnered with Dana for its powertrain thus maximizing range performance	Yes	Differential axle ratios are determined by the axle on the vehicle which are semipermanent components. Changing the ratio would require a different axle. The axle differential ratio is designed to achieve an overall performance that is suitable for most environments.	No	6.14 rear axle ratio required
5 Wheelbase up to 280" - Specify for Each body size	Yes	252" Wheelbase with 3011 body size (71 Passenger bus) 273" Wheelbase with 3310 body size (75 Passenger bus)	Yes	278"	Yes	276"	Yes	Available in 259 wheelbase 311TS body size (up to 71 passengers) and 279 wheelbase 341TS body size (up to 77 passengers)
6 Remote air tank drains	Yes	Heated automatic drains for all reservoirs included. If remote manual drains are required then they must be on the left.	Yes	With standard air ride suspension also present if air brakes are selected	Yes		Yes	
7 Rear tow hooks	Yes		Yes		Yes		Yes	
8 Wheels - Disc hub piloted	Yes		Yes		Yes		Yes	
9 Tires - Six (6) -11R22.5 Michelin XZE 2 preferred	Yes		Yes		Yes		Yes	
10 Rear Axle - Capacity: 19 500 lb Maximum speed required: 110 kmh Cruise control set at 100 kmh 21 000 lb air ride suspension.	Yes	Max rear axle capacity is 23000 lb. Maximum speed is 104.6 kmh. Cruise control is not available. If air ride suspension is used then it will have a rating of 23000 pounds.	No	The LionC is compliant for the rear axle but has no cruise control.	Yes		Yes	Michelin XZE2 steer tires and Michelin X Multi Maximum rear axle capacity is 23000 lb. Maximum speed is 105 kmh. Cruise control is not available. Air ride suspension is 23000 lb.
11 FRONT AXLE 10 000 lb minimum 10 000 lb spring suspension	Yes		Yes		Yes		Yes	
12 AIR BRAKES 5 cam W/ABS Min. 13.2 cfm compressor Spring brakes for emergency and parking Auto slack adjustors long stroke Air dryer 16-1/2 x 5 Front 16-1/2 x 7 Rear backing plates	Yes		Yes	Lion leverages disk brakes instead of drum brakes therefore there is no need for a slack adjuster. Lion's diskbrakes meet ASTSBC expectations.	Yes		Yes	
13 Regenerative braking to charge batteries must meet all Canadian Motor Vehicle Safety Standards in regards to braking systems	Yes	Bluebirds regenerative braking system to charge batteries meets all Canadian Motor Vehicle Safety Standards in regards to braking system	Yes		Yes		Yes	
14 BATTERY - *200 kwh minimum* - Vendors should describe their proposed energy storage/battery system including the number of battery packs and battery chemistry. "Battery efficiency (kilometers per kWh) "Time (in minutes) to charge batteries from 20% to 100% state of charge on a level 2 charger. "Time (in minutes) to charge batteries from 20% to 80% state of charge on a level 2 charger. "Battery capacity (amps per hour per cell) "Battery storage capacity (kWh) "Total usable battery energy storage capacity (kWh) "Total battery pack C-rate. "Total battery pack E-rate "Battery Cycle Life in number of charge-discharge cycles at a specific depth of discharge (DOD) "Battery thermal management type (describe battery maintenance and operational requirements when vehicle is in use and not in use	Yes	Number of packs: 9 batteries in two packs for a total of 18 batteries (200kWh) Chemistry: Li-NMC-G batteries which is Lithium-Nickel Manganese Cobalt-Graphite Battery efficiency: Will dependent on several factors including driving habits terrain and use of a/c and heaters. Time to charge Level 2 (20%-100%): 400-430 minutes Time to charge Level 2 (20%-80%): 300-330 minutes Battery capacity: 126 Ah Battery storage: 196 kWh Total usable battery storage: 157 kWh C-rate: The charge rate is 1C and the discharge rate is 2C E-rate: This is proprietary and will not be disclosed Battery life cycle: 3000 cycles at 70% depth of charge Battery thermal management type: Blue Birds battery thermal management type is a system of heaters chillers a radiator and fluid pumps design to maintain the optimal operating temperature of the batteries and the main propulsion motor by regulating the temperature of the fluid flowing through them. Temperature sensors monitor the coolant for the batteries and the motor and the VCU uses that information to either activate the heaters to heat the coolant or to activate the chiller to cool the components. Maintenance required for the propulsion batteries is to torque the hardware every 12 months or 20000 miles. Maintenance for the thermal management system is to check the coolant level every 32000 km and change it every five years.	Yes	"The LionC Type C all-electric school bus 210 kWh battery pack for up to 250 km will be available for Q1 2024 delivery. 210 kWh equates to 5 battery packs - Lion leverages lithium ion batteries.  Scenario 1 with a 19.2 kW charger : 20% to 80% : charging to be obtained in approximately 390 minutes (6.5 h) Scenario 2 with a 19.2 kW charger : 20% to 100 % : charging to be obtained in approximately 525 minutes (8.75 h) "" Battery capacity (amps per hour per cell) = Total is 120Ah cells for 1 battery ; 96 cells so 125 Ah per cell "" Battery storage capacity (kWh) 42 kwh per battery "" Total usable battery energy storage capacity (kWh) : 5 batteries : 178,5 kwh ; "" Total battery pack C-rate. Lion C : 0.68 "" Total battery pack E-rate Lion C : 1.46 "" Battery Cycle Life in number of charge-discharge cycles at a specific depth of discharge (DOD) - Charging time (energy input into HVS all HVS sub components active and/or operative): 10500h(charging from grid with 3.6kW) "" Battery thermal management type - The HVS (High Voltage Storage) can be operated in a cell temperature range of -40°C to +53°C measured at the hottest point of any cell surface. Power degradation applies at extreme high and low temperatures. To enhance the lifetime a power derating based on the cell temperatures is implemented. The HVS will be functional at installation space temperature up to +80°C as long as the cell temperatures remain in the specified range. The HVS (High Voltage Storage) conditioning system consists of: - a combined electronic thermostatic expansion and shutoff valve -refrigerant pipes -refrigerant circuit inside the HVS	Yes	The battery system consists of 2 strings of 3 battery packs each achieving a total capacity of 210kWh and a nominal voltage of 608V. Each pack has a 1P63S cell configuration. The cells are prismatic and use LFP chemistry. Lithium-Ion Batteries (6) 210kWh total 608V 345Ah total. Vehicle efficiency 0.84 kwh/km Level 2 Charge time: 20kW x T = 60% x 210kWh T = 378 Mins Useable capacity = 70% x 210kWh = 147 kWh Pack C Rate = 1 (continuous discharge) Pack C Rate = 0.7 (continuous charge) Attachment	Yes	2 battery packs - 110kW=220kW Battery Capacity 1.474 vehicle efficiency total usable battery capacity = 198kW 20% to 80% Charge = 1.2hrs on 60kW charger - 2.75hrs on a 24kW charger 194kWh usable/ available energy onboard at beginning of life (97kWh per pack 2 packs per vehicle) ~1c/E peak charge rate ~1.8C/E peak discharge rate ~0.5C/E peak continuous charge rate ~0.7C/E continuous discharge rate.

			<p>Main purpose of the electrical refrigeration cooling system is to reduce temperature caused by dissipation heat during operation. The active cooling system is a direct refrigeration system where the evaporator unit is integrated as a cooling element inside the HVS. The refrigeration tubes are located underneath the cell modules. The HVS used R134a refrigerant.</p> <p>The process Lion used to arrive at the range of its buses is from real-world experience. Over 300 of Lion’s buses have been actively on the road for over 4 years and these buses have demonstrated the true capacity and range of Lion’s ZEVs. Lion’s longer-range buses have a demonstrated range with help from the regenerative braking system as well as our battery management system and battery temperature management system technologies that are included in all Lion buses Lion does not need to rely on projections to provide range information for its buses because the Lion buses that have already been operating for several years have proven that longer range distances are a reliable feature of its buses.</p> <p>Lion leverages its proprietary Battery Management System for all the maintenance and operational requirements</p> <p>LionC 168 kWh for up to 200 km is available for delivery in 3 to 6 months after purchase order and comes with a discount of \$30,000 for a total price of \$410,000 per vehicle. Please consult OptionPricing line 36 for additional details."</p>				
15 Back-up alarm 97 dB minimum	Yes		Yes		Yes		
16 High capacity dry type air cleaner c/w air restriction gauge to be mounted on dash or air intake	Yes	This vehicle uses an electric motor for its propulsion system and therefore an air cleaner is not required.	No	Yes	No	There is no air restriction gauge on our EV	
17 Battery Management System	Yes	Blue Birds Battery Management System (BMS) facilitates smart charging by monitoring battery State of Charge (SOC) and other parameters associated with State of Health (SOH) and communicates to the system controller (SCM). The SCM will then determine how much charge should be provided to the battery based on the current state of the battery and control the on-board chargers appropriately.	Yes	Yes	Each battery pack is equipped with a battery management system to monitor battery life state of charge and other proprietary variables.	Yes	Battery thermal management includes battery coolant heater and chiller to manage battery temperature when charging and driving
18 On-Board Charging Systems Vendors should describe their preferred charging/discharging systems including EVSE noting that the expectation is that vehicles will be fitted with on board AC (19.2 kW) bidirectional charging/discharging systems that conform to the most recent SAE J1772 standards and/or other relevant standards for V2B bi-directional power flow. The vehicles should also be fitted with DC charge/discharge coupler capable of a sustained maximum of 90kW of power transfer at a maximum of 200 AMPs. The coupler should conform to all current SAE standards. All charging system components shall have CSA certification or provide acceptable documentation. Charging systems shall be capable of operating from -30C to 40C with no more than 10% degradation in performance	Yes	Blue Bird offers a standard CCS1 connector that allows for Level 3 DC Fast Charging. For maximum 80kW charge rate each Level 3 DCFC station must be supplied with three phase 480VAC 80 amp. A bus will fully charge with DC Fast Charging from 0-100% in about 3 hours. There are several Level 3 EVSE's available on the market today that meet these charging requirements including the Nuvve HD60 and the InCharge ICE-60. Blue Bird has decided to include bidirectional charging functionality with only DC charging at this time due to V2G interconnection requirements of most utilities across North America. The Nuvve RES-HD60-V2G is the required charging solution for V2G capability to be enabled with our electric bus.	Yes	Yes	See Attachment	Yes	Our EV has DC batteries and require DC charging charger coupler meets SAE we offer a 25kW wall charger or a 60 kW station charger with V2G capability.
19 Heavy Duty hoses to meet current coolant standards.	Yes		Yes	Yes		Yes	
20 Data collection for performance and analytical comparisons must be available on a regular basis for both ASTSBC and the purchaser. Training must be provided	Yes		Yes	Yes		Yes	
21 Oil lubed front wheel bearings or sealed bearings	Yes		Yes	Yes		Yes	
22 SERVICE MANUAL AND DIAGNOSTIC SOFTWARE Service manual for engine and chassis Engine and body diagnostics software or licensing if web based. Diagnostic Training must be provided to each purchaser	Yes	Body diagnostics software service manual and training are included. Cummins Corporation currently is not offering any technical manuals on their powertrain and battery management system. Due to the high voltage electrical systems integrated into Blue Birds Bus platform Cummins is responsible for all repairs made to these systems.	No	Yes	On Command will be used and will be provided to purchaser and ASTSBC	Yes	Parts & service info on-line engine diagnostic software 1 per district
		Please call Dynamic for service and warranty to facilitate and expedite services required.					
23 Supply Driver Training and Orientation to ASTSBC Trainers to supply training for drivers upon bus delivery.	Yes		Yes	Yes		Yes	
24 Supply line setting ticket	Yes		Yes	Yes		Yes	
25 Heater cut off valve at source	Yes	Located on the left wall in the driver's cockpit area	Yes	Yes		Yes	
26 Battery location and weight - please describe	Yes	The high voltage batteries are located under the chassis frame rails between the front and rear axle. Approximate weight is 1406 kg.	Yes	Yes	Batteries are mounted in between the frame rails and rigidly attached using welded and bolt on brackets. Each battery pack weighs 491 lbs. Batteries are protected from the elements. Batteries are backed by international standards rating of IP68 and are deemed fit enough to withstand dust dirt and sand and are resistant to submersion up to a maximum depth of 1.5m underwater for up to 30 minutes and encased in an aluminum box.	Yes	Location is mid bus under frame rails approximate weight is 1600kg