

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

		Dynamic Specialty Vehicles	
		Submission 1	
Line Item	Bus Description	Unit Price	
1	Type D ( 80+ Passenger or Maximum Capacity ). All units and components must meet Federal and Provincial regulations and requirements and current D250.	\$ 541,569.0000	

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

		Dynamic Specialty Vehicles		
		Submission 1		
Line Item	Optional Pricing	Charge Type	Unit Price	Additional Information
1	One (1) additional spare tire mounted.	Additional	\$1,309.00	Ship loose
2	Air horn roof mounted.	Additional	\$254.00	
3	Current Gatekeeper digital video system supplied and installed with 2 cameras.	Additional	\$2,360.00	
4	Current Seon digital video system supplied and installed with 2 cameras.	Additional	\$2,360.00	
5	Driver's storage compartment overhead left side.	Additional	\$219.00	
6	Installed Zonar current Fleet GPS Tracking and Vehicle Diagnostics System with EVIR hand held device and all accessories. Include pricing for each hand held device.	Additional	\$850.00	
7	Zonar current Fleet GPS Tracking and Vehicle Diagnostics System installed.	Additional	\$615.00	
8	Drivers Clipboard Storage accessible from drivers seat.	Additional	\$27.00	
9	Traction control through ABS.	No Charge	\$0.00	
10	Driver controlled differential lock.	Additional	\$1,523.00	
11	Limited slip rear axle.	Not Available	\$0.00	
12	Automatic greasers minimum of 12 grease points.	Additional	\$3,843.00	
13	Acoustic ceiling panels throughout.	Additional	\$908.00	
14	Stop Arm Camera System	Additional	\$450.00	Seon camera only. 2 Camera Seon Stop Arm 1000. Gatekeeper Stop Arm Camera + License Reader 1085
15	Interior mirror - 10" x 30" mirror adjustable no windshield obstruction.	Additional	\$35.00	
16	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.
17	Emergency roof hatch vent with exhaust fan.	Additional	\$1,112.00	
18	Wheelchair lift specify OEM. Supply and install wheelchair lift with one chair position across from lift inclusive of tie down system.	Additional	\$14,000.00	
19	Track seating per wheelchair space.	Additional	\$1,565.00	
20	Tinted windows throughout.	No Charge	\$0.00	
21	Power and Range upgrade / downgrade -Price for each range option available	Additional	-\$16,500.00	Downgrade 155 kWh Battery
22	Pedestrian Detection System	Additional	\$2,450.00	Mobileye System
23	Integrated child seats/per seat. Attach information details.	Additional	\$808.00	
24	Telescopic steering.	No Charge	\$0.00	
25	Hydraulic brake school bus with air seat and air suspension.	Not Available	\$0.00	
26	Hydraulic brake school bus (no air components).	Not Available	\$0.00	
27	Adjustable Foot Pedals	Additional	\$1,488.00	
28	Underbody full thru luggage compartments	Not Available		
29	In-service training for chassis and body maintenance procedures at Purchaser's facility	Additional	\$2,500.00	
30	Laptop & connectors with applicable programming & software or licensing including training for each style of bus supplied. 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)
31	exterior entry door handle	No Charge	\$0.00	Training included. Included in the base bus price. Option: Ruggedized exterior entry door handle with lock available.
32	Extended Stop Arm	Additional	\$5,880.00	
33	35- Air operated disc brakes	Additional	\$3,230.00	
34	First Light Safety Products FULLY ILLUMINATED STOP ARM Air Drive	Additional	\$1,961.00	

35 First Light Safety Products FULLY ILLUMINATED STOP ARM Electric Drive  
 36 First Light Safety Products ILLUMINATED SCHOOL BUS SIGN

Additional \$1,961.00  
 Additional \$1,200.00 Factory installed illuminated sign equivalent at 1200. Aftermarket installation of First Light Safety Product Illuminated School Bus Sign 2286

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

		Dynamic Specialty Vehicles	
		Submission 1	
Line Item	Body Specifications	Yes/No	Additional Information
1	Full power steering - minimum 18" diameter steering wheel Tilt steering column telescopic	Yes	
2	Aluminized Interior Steel Walls Head Room - 77" Subfloor - 5/8" plywood Rubber covered light coloured ribbed in aisle Floor materials to be covered to sidewalls	Yes	
3	Wheel housings to be molded type and fully covered All joints to be silicone sealed - including sidewalls and perimeter	Yes	
4	Mud flaps Installed on front and on rear wheels rubber fenderettes on all four (4) wheel wells	Yes	
5	Exterior paint to meet national school bus yellow standard black rub rails light colour interior	Yes	
6	Exterior Lettering 6" - (Purchaser name) both sides at belt line 4" - Bus # two front corners and opposite license plate rear	Yes	
7	Exterior Lettering con't 2" - Capacity GVW (Purchaser name) on side panel back of entrance door and side panel below driver	Yes	
8	Internal signs over windshield - No Smoking - No Standees	Yes	
9	Body fully undercoated for noise and enhanced rust protection. Please describe what is included and optional levels of protection available including costs	Yes	Asphalt emulsion undercoating included.  Options: 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.
10	Crossing arm deactivation switch	Yes	
11	Tinted windshield wipers dual electric with intermittent control Windshield washers with wet arm windshield washer tank 2 litres minimum	Yes	
12	Split sash side windows tinted	Yes	
13	All emergency exits to be vandal lock equipped	Yes	
14	Two (2) roof emergency escape hatches	Yes	
15	Entrance door to be air or electric operated with an emergency release valve mounted outside. Both doors heavy duty split type windows in upper and lower sections to open outward	Yes	
16	Entrance steps covered white trimmed with assist rails right and left side	Yes	
17	Body insulation including walls ceiling and roof bows - to be fibreglass or equivalent Dust intrusion package on underside of bus up to floor joint	Yes	
18	Power to accessory side of ignition	Yes	
19	Circuit breakers	Yes	
20	Instruments: Dash mounted hr meter Battery Monitor speedometer in kmh c/w odometer in km Range (2) air pressure gauges if air equipped. Please describe Instrumentation and dash cluster provided	Yes	Speedometer Efficiency Gauge Message Display Center State of Charge (SOC) Motor Temperature Battery Temperature Front Air Gauge Rear Air Gauge Left Warning Area Right Warning Area Message Display Center Control Panel Center Warning Bank
21	Instrument panel shall be illuminated and include text light indicators monitoring both the amber and red light warning activations; Icruise control activation cruise control	Yes	Cruise control not available on Electric Bus.
22	12 volt power point in switch panel	Yes	
23	Back-up alarm	Yes	
24	Two (2) LED strobing stop arms - mounted front and rear driver's side with wind guards.	Yes	
25	Driver alert system installed on battery door	Yes	
26	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 and visors	Yes	
27	Two (2) rows of interior lights front and rear half on separate dimmer switches	Yes	
28	One (1) driver's light on separate switch	Yes	
29	Interior rear view mirror and sun shield. Minimum 6" to maximum 10" x 30" with no obstruction of windshield	Yes	
30	Right and left side primary and convex mirrors; remote adjustable Exterior convex crossovers self-defrosting mounted on right and left sides	Yes	

31 Two (2) heavy duty auxiliary windshield defroster fans switched separately one for each windshield. To cover full width of windshield and drivers left side window. Heavy duty defroster motors.	Yes	
32 Defroster approximately 90 000 BTU capable of clearing front windows	Yes	
33 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.	No	Type D Electric Bus does not include a diesel fired heater. Ideal for lower mainland.
34 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.	No	Bus is equipped with electric heaters and passenger area can be heated while charging during pre-check.
35 One (1) heater unit for driver's control area (transit type) - 10 000 BTU min.	Yes	
36 First Aid kit fire extinguisher flare kit all mounted in overhead compartment.	Yes	
37 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	
38 Passenger seats to be seat belt ready 3x3 seating on both sides. Seats to be wall mounted on one side All seat coverings to be HD fire resistant gray vinyl.	Yes	
39 Pre-wired power and ground thru noise suppression circuit for 2-way radio	Yes	
40 AM/FM/PA radio and CD player	Yes	
41 PA system with six (6) interior and one (1) exterior speakers separately controlled	Yes	
42 Each unit shall be equipped with a Sound Generator that complies with FMVSS and CMVSS 141	Yes	

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

<u>Line Item</u>	<u>Chassis Specifications</u>	<u>Dynamic Specialty Vehicles</u>	
		<u>Yes/No</u>	<u>Additional Information</u>
			<u>Submission 1</u>
1	Chassis and Body Year	Yes	Blue Bird 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. 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	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.
3	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?	Yes	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.
4	Air Brakes - Rear drum: 16½" x 8"; Front drum: 16½" x 6" with dust shields. Auto slack adjusters long stroke S cam type brakes. ABS included. Auxiliary Equipment tank right hand remote drain	Yes	
5	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.
6	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

<p>7 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</p>	<p>Yes</p>	<p>Number of packs: 9 batteries in two packs for a total of 18 batteries  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.</p>
<p>8 Battery Management System. Must be described</p>	<p>Yes</p>	<p>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. The SCM also communicates the desired charge rate through the CCS1 connector to the off-board charger to ensure proper charge rates are delivered. The BMS monitors SOC and SOH and reports it to SCM. This data is recorded every 10 milliseconds.</p>
<p>9 Front axle - 14 000 lb taper leaf set back. Rear axle - 23 000 lb - performance chart must be supplied Rear axle ratio - Please specify options available Specify turning radius.</p>	<p>Yes</p>	<p>Front axle 12000 lb Rear axle is 23500lb  Turning radius curb to curb 33'2"; wall to wall 37'9"</p>
<p>10 Air suspension rear c/w levelling valve(s). Heavy duty shock absorbers.</p>	<p>Yes</p>	
<p>11 Tires - Two (2) -11R22.5 Michelin XZE 2 on front preferred Four (4) -11R 22.5Michelin XDN2 on rear preferred disc wheels 10 stud hub pilot. Please specify your OEM equivalent if different</p>	<p>Yes</p>	<p>KUMHO equivalent supplied. Micheline XZE &amp; XDN2 available as an option.</p>
<p>12 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</p>	<p>Yes</p>	<p>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 Nuvev 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 Nuvev RES-HD60-V2G is the required charging solution for V2G capability to be enabled with our electric bus.</p>
<p>13 Tow hooks front and rear heavy duty bumper.</p>	<p>Yes</p>	
<p>14 Battery solenoid switch to be connected to ignition switch for isolation of all of the switch panel circuitry.</p>	<p>Yes</p>	
<p>15 Data collection for performance and analytical comparisons must be available on a regular basis for both ASTSBC and the purchaser. Training must be provided</p>	<p>Yes</p>	
<p>16 Engine and body diagnostics software or licensing. Diagnostic Training must be provided to each purchaser</p>	<p>Yes</p>	
<p>17 Supply Driver Training and Orientation to ASTSBC Trainers to supply training for drivers upon bus delivery.</p>	<p>Yes</p>	
<p>18 Service Manual for engine and chassis</p>	<p>Yes</p>	
<p>19 Battery location and weight - please describe</p>	<p>Yes</p>	