


10 – Low Carbon Fleet

June 14, 2022

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Agenda

1. Project Expectations
2. Procurement Process
3. Selected Vendor: Proterra
4. Next Steps

Mission

Deliver a complete integrated heavy duty battery electric bus solution that represents the best example of future zero emission transit and models the way for other vehicle classifications.

Project Expectations:

- Implementation of 10 electric buses:
  - Start where other agencies have left off
  - Learn new information by doing
  - Form partnerships and establish resources
  - Setup a structure that supports future deployments
  - Early adopter of electric buses in Canadian public transit, and the first in regular BC Transit service
  - Target Annual GHG Reductions ~780 tonnes CO2e

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Established Project Requirements:

Through work with other transit agencies, information gathering, and technical experts engaged on the project, project requirements were established, highlights include:

- Single point of accountability by vendor, with an “Integrated solution” incorporating buses, chargers, design, construction, and supporting systems
- Solution represents the future of electric bus operation (long range, fast charging, high capacity, and well integrated with charging)
- Buses, chargers, and systems incorporate a high degree of flexibility to support future changes in technology
- Scalability for future buses and chargers is incorporated
- Space claim from charging infrastructure is mitigated
- Reliability and redundancy considered
- Plug-in and overhead charging capabilities incorporated

Procurement Process

Stage 1:

- Initial proposals – evaluated on qualifications, experience, and bus specification.
- Top two shortlisted for the next stage.

Stage 2:

- Concurrent evaluations

Stage 3:

- Best and Final Offer proposals

Selected Vendor

- Largest producer of BEBs in North America >1000 BEBs delivered
- Turn-key project delivery
- Longest range BEBs
- Vertically integrated propulsion system development, battery pack manufacturing, and software platform development
- First integrated heat pump in North American market
- Buses operating in Edmonton, Toronto, and Banff
- 135 customers in North America

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Project Team

PROTERRA

- Total responsibility for turn-key project
- In-house construction project manager and design manager

FORBES BROS GROUP OF COMPANIES

- Primary constructor
- Multi-national corporation, leading utility constructor
- BC high speed charging equipment deployments

AES

- Electrical designers
- TransLink low carbon fleet strategy, rapid transit, Skytrain, and more
- Supporting HDR on BC Transit's electrification analysis project

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Battery Electric Buses

Proterra ZX5-Max

- Represents longest range and highest passenger capacity in the market
- 675kWh battery integrated into the floor (4 packs floor, 2 pack roof)
- Advanced safety systems
- Zero Arc Flash Hazard
- Heat pump and auxiliary fuel heater

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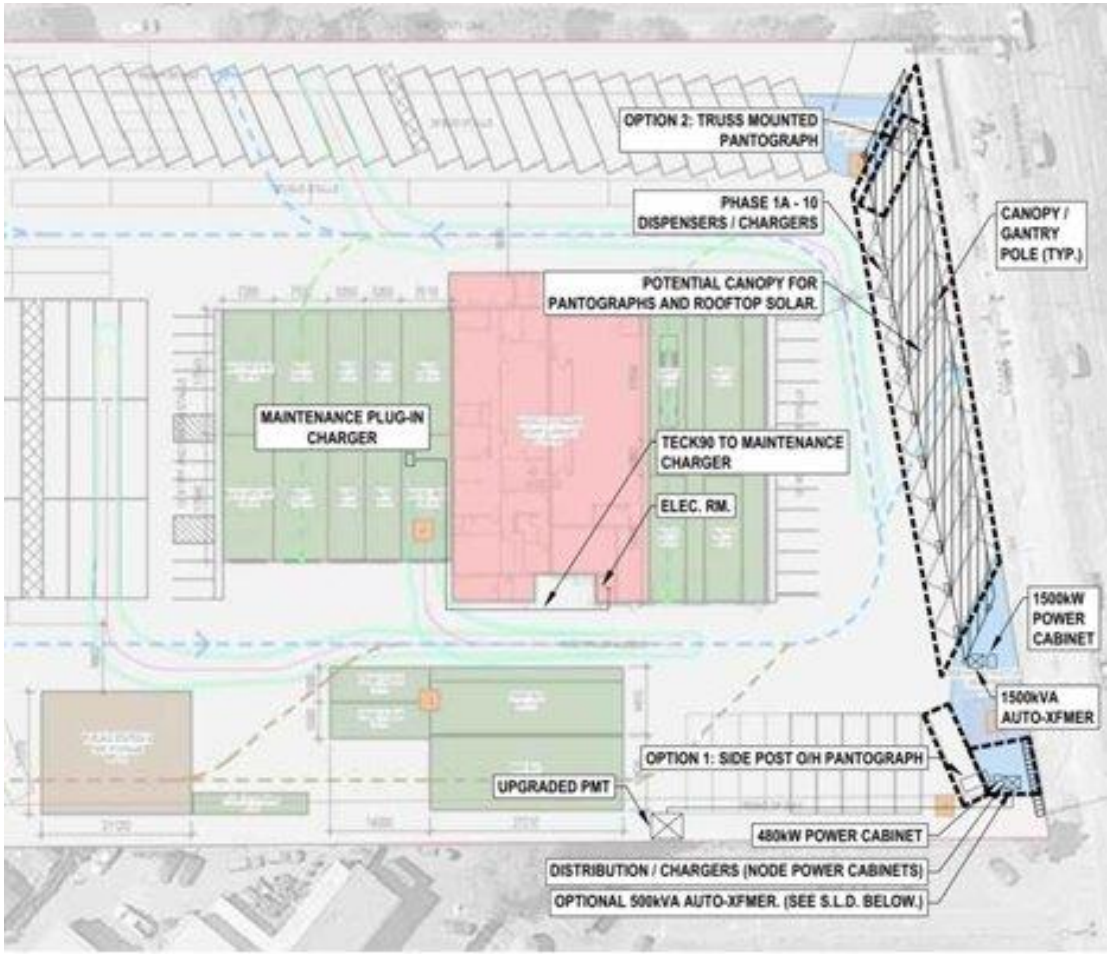
Specification Comparison

- Proterra ZX5-Max
  - 12.95m length
  - 36 seated passengers
  - 66 total passengers
  - Range ~300km to 500km
  - Turning radius 13.1m
  - Composite structure
- New Flyer Xcelsior CNG
  - 12.5m length
  - 35 seated passenger
  - 81 total passengers
  - Range ~600km
  - Turning radius 11.8m
  - Steel and stainless structure

Charging Infrastructure



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Charging Equipment

- **150kW Charging Units**
  - Two vehicles simultaneously

- **1.5MW Charging Units**
  - Up to 20 vehicles simultaneously

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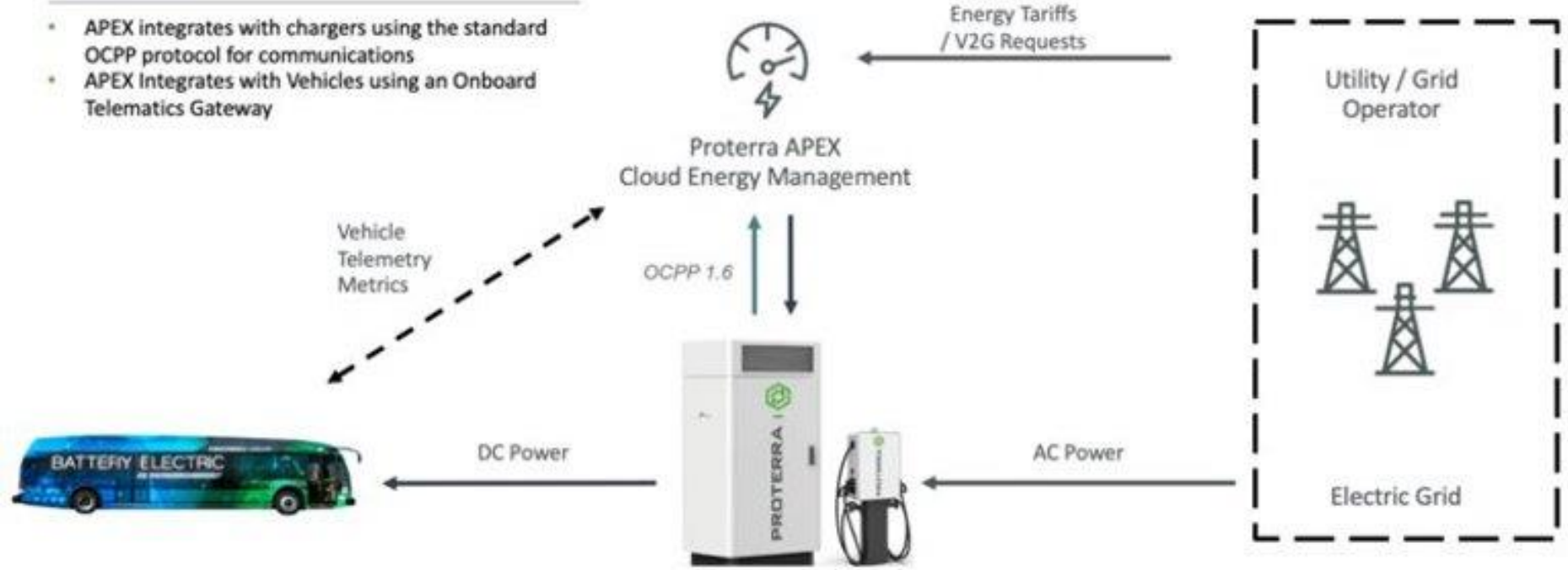
Performance Monitoring Systems

Charging Management Software (APEX)

Integration

- APEX integrates with chargers using the standard OCPP protocol for communications
- APEX Integrates with Vehicles using an Onboard Telematics Gateway



VRTS Project Implementation Plan

- Turn-key solution with single point of accountability
- Schedule for contractual deliverables:

Dates	Deliverable
May 2022	• Bus configuration locked down • Infrastructure design development
June 2022	• Charging equipment ordered
Fall/Winter 2022	• Demonstration bus/charger delivered • Construction onsite
May 2023	• Construction completed • First built-to-specification buses arrive
August 2023	• Completed delivery of all buses

What's Next

- Planning the Next Deployments:
  - Electrification energy modeling (complete)
  - Finalizing concept designs (in progress)
  - Developing transition plans for identified depots (in progress)
  - Developing business cases for Infrastructure and BEBs
  - Utility power