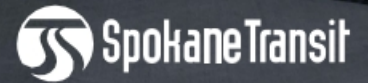




# Battery-Electric Buses

## Moving Towards a Zero-Emission Fleet



### *Spokane Transit's Commitment to Sustainability*

Spokane Transit has been researching alternative fuel vehicles as far back as 2007 with the purchase of their first three diesel/ electric hybrid 40-foot coaches. In 2012, the STA Board of Directors adopted a triple bottom line framework for STA's Sustainability Policy where environmental, social and economic factors are considered in concert when exploring sustainable fleet solutions.

Since then, compressed natural gas, biodiesel, clean diesel, fuel-cell electric and battery-electric buses have all been considered and researched. A study conducted in 2015 concluded STA would continue purchasing diesel coaches while preparing to transition the fleet to battery-electric buses as diesel buses were retired at the end of their useful life of about 14 years.

A further study in 2019 affirmed STA's approach and battery-electric buses were ordered for the City Line and Route 4 along the Monroe/Regal corridor. STA is proud to unveil their brand new battery-electric buses while continuing to keep an eye on emerging technologies as they mature.



### *Benefits*

Battery-electric buses will provide the following benefits to the community:

- **Lower operating costs**
- **Zero emissions / environmentally friendly**
- **Quieter vehicle operation is better for neighborhoods and riders alike**



**Why is STA buying electric buses?**

The operating costs of Battery-Electric Buses (BEBs) make them more economical than internal combustion engine buses. It is cheaper to power vehicles with electricity rather than diesel, and electricity prices are generally much more stable than gasoline or diesel prices. They also provide a better experience with less vibration, less noise and zero exhaust.

**Is STA electrifying its entire fleet?**

STA is committed to fulfilling their Sustainability Policy and is committed to reviewing technologies as they mature. The current proposal is to have 40 BEBs in the STA fleet in the near future.

**What is the environmental benefit of battery-electric buses?**

The primary benefit of transitioning an entire fleet to BEB's is the reduction of greenhouse gas emissions.

**How much quieter are electric buses than diesel buses?**

According to the Altoona Bus Testing Center, BEBs can expect a decrease in noise of about 24 db in the passenger area and 25 db outside the vehicle.

**Are battery-electric buses more expensive to purchase than diesel buses?**

Battery-electric buses are more expensive to procure. However, STA has been able to use State and Federal moneys to offset 100% of the increase in capital for all current BEB orders.

**What is the lifecycle cost difference between electric and diesel?**

According to an Electric Bus Analysis Report from Columbia University, the total 12 year lifetime cost of electric vs. diesel bus, excluding healthcare and cost of carbon, is an estimated savings of \$168,000 per BEB. Including healthcare and cost of carbon, the savings are estimated to be \$1,416,000 per bus.

**Can STA maintain the same level of service and invest in battery-electric buses?**

STA has a stated goal of only purchasing BEB's when additional outside funding is available to pay the difference between diesel buses and BEB. This strategy will result in additional battery-electric buses at no additional cost to STA, which allows STA to maintain service levels.

**Do electric buses work on all the routes in the STA network?**

The industry has seen major advancements in battery capacity and the range of buses in recent years. Along with the increase in battery capacity, improvements in vehicle design, vehicle electrical systems and drive train improvements are bringing BEB's much closer to handling all of STA's routes.

**What will STA be doing to train employees to maintain electric buses?**

Bus manufactures will train our maintenance team on high voltage safety, maintenance, inspection, charging and vehicle recovery.

**What is involved with coach operator training?**

Training to recharge BEBs at layover stops and the basic differences between operating a diesel-powered bus and a BEB.

**What is involved with first responder training?**

STA is working with local jurisdictions to ensure first responders know where battery shut offs and high voltage equipment are located so they can safely respond to emergencies.

**How long does an electric bus last?**

The FTA's usable life for a BEB vehicle is the same as diesel: 14 years.

**How long does it take to charge an electric bus?**

Depending on the battery state of charge, an on-route 450 kWh charger will charge 1% every minute, and a depot 150 kWh charger will charge 1% every three minutes. STA has installed both types of chargers.

**What changes does STA have to make to accommodate bus electrification?**

The Boone Northwest Garage was built with BEBs in mind with much of the facility work done before the first bus arrived. STA has installed depot charging equipment for overnight charging and placed on-route charging equipment at Moran Station and SCC Transit Center to recharge while buses are in operation. Additional on-route charging equipment may be added as needed.

**What is STA's maximum power load capacity based on current Avista capabilities?**

The Boone Northwest Garage has a 3MW capacity. This is enough to meet current plans.

**What will be STA's average daily power draw be while buses charge overnight?**

With the charging equipment currently installed, the amount of energy is estimated to be 833 kW per day.

**Does STA's use of power at its Boone facilities impact the neighborhood or businesses in the area?**

Avista's load calculations for Boone Northwest Garage are based on the substation and grid capacity for the area.

**What will STA do if there are long term power outages like during wind or ice storms?**

STA has purchased and installed backup generators to provide power to the Boone Northwest Garage to ensure service reliability.

**Does STA have enough room in its garages for the number of electric buses it will purchase?**

Yes. Based on current fleet procurement, STA will be able to park and maintain 40 BEBs, as well as seven double-decker buses. STA is currently updating its Facilities Master Plan to ensure its facilities keep pace with BEB acquisition.

**How will battery-electric technology change over time?**

The industry has seen major advancements in battery capacity and the range of buses in recent years. Along with the increase in battery capacity, improvements in vehicle design, vehicle electrical systems and drive train improvements are bringing BEB's much closer to handling all of STA's routes.

**Are there ways to accelerate fleet electrification?**

STA is currently working with industry experts to study how to plan and deploy more zero emission buses in future years.