ZERO EMISSION BUS INITIATIVE
FAQs | October 2023

General Overview and Background:

Why is TheRide considering zero emission buses?

The move to zero emission buses is based on goals from our Board of Directors, the values of the community, and an increasing regulatory push towards cleaner transportation. There have been rapid advancements in the technologies, favorable fiscal incentives, new funding programs, and with the alternative vehicle market getting more mature.

What kind of buses does TheRide currently operate?

TheRide currently has a fleet of both Diesel and Hybrid buses, from Gillig and Nova.

Zero-Emission Bus Options and Technologies:

What are the zero-emission bus options being considered?

The zero-emission bus options that are being considered are:

- Hydrogen fuel cell electric buses (FCEB)
- Battery electric buses (BEB)

What is hydrogen propulsion? Why is it being considered? Where is it being used?

FCEBs use fuel cells to generate electricity by combining hydrogen and oxygen. The fuel cell charges a small battery which drives the electric motors. They are fueled by filling a storage tank for several minutes, and typically require only one fueling station. FCEB is being considered because it is one of two zero-emission bus technologies.

What is Battery Electric Buses? Why is it being considered? Where is it being used?

BEB use batteries to store electricity and drive the electric motors, and typically require numerous charging stations and several hours to fully recharge. BEBs are being considered because it is one of two zero-emission bus technologies.

What are the benefits of each zero-emission bus option?

- Fuel Cell Electric Buses:
    - Long operating range – can deliver over 90% of AAATA service in cold weather
    - Minimal changes to services cycle compared to current diesel buses, meaning that fueling, washing, and parking procedures can proceed largely unchanged
    - Lower maintenance costs compared to diesel and other fossil fuel buses
    - More cost effective at scale
- Battery Electric Buses:
    - Lower vehicle costs compared to hydrogen fuel cell
    - Lower maintenance costs compared to diesel and other fossil fuel buses
    - Battery range expected to improve
    - Lower fuel costs compared to hydrogen and fossil fuel buses

Are electric buses like electric cars?

Heavy duty vehicles like buses can be in continuous use for 16 hours each day while running a heater, and require far more energy than a light duty car.

Pilot Project Details:

What is the purpose of the CEO's recommendation?

The CEO is recommending a hydrogen fuel-cell bus pilot project as a step towards advancing the Board's goals of reducing emissions and ensuring fiscal health.

What does the pilot project entail?

The pilot project, spanning 4-5 years, will include:

- 2 hydrogen fuel-cell buses
- 1 outdoor tank/fueling station
- Workforce training
- Continuation of buying diesel buses in the interim

What is the expected outcome if the pilot is successful?

If successful, there will be full deployment starting in 2030 to eliminate all bus emissions.

What is the immediate timeline for this recommendation?

- 2021-2022: Initial Research and Public Engagement
- October 2023: CEO Recommendation for Board
- Oct '23-Dec/Jan: Board Discussion & Public Feedback
- Jan 2024: Board Decision (for 2024 grant)
- Jan-March 2024: Grant preparation
- March/April 2024: Anticipated grant deadline
- Oct/Nov 2024: Anticipated grant awards

Why is a pilot project being recommended?

A pilot project allows for a test of 2 buses before making a larger commitment. It provides tangible progress towards a solution and minimizes initial investment and risk.

What are the financials for the pilot project?

Capital Cost: $5.5-$7.5 million with 80%-90% covered by the federal Lo-No Emission Grant. The total costs to TheRide are estimated to be $2.5-$4.7 million over five years.

What are the other priorities during the pilot?

Other efforts include refining cost estimates for full garage modifications, monitoring hydrogen market development, evaluating centralized vs on-site hydrogen generation, and conducting zero-emission studies for other vehicles and facilities.

How will the success of the pilot project be measured?

The pilot will be deemed successful if there's confidence in a path to full deployment of a solution that eliminates all emissions from bus propulsion without risking services to customers.

What happens if the pilot project is not successful?

If the pilot isn't successful, the findings will be analyzed to determine the challenges faced. TheRide will then consider alternative technologies or modifications to the current approach based on the lessons learned.

Decision-making and Recommendations:

When will a decision be made about which propulsion technology TheRide will make?

The federal government accepts grant applications every year. The goal is to have the Board of Director's approval by January 2024, to allow for time to develop and write grant submissions.

Who will decide which propulsion technology will be used?

TheRide's CEO will provide a recommendation to TheRide's Board of Directors for consideration. This recommendation will be based on the propulsion study, combined with feedback from staff, outside experts and early adopters, stakeholders and the community. The Board of Directors will review the recommendation and determine next steps.

What is the CEO's final recommendation?

The CEO recommends moving forward with the hydrogen pilot grant proposal as it is more practical today and better suited for full deployment in the future.

Why is hydrogen being chosen over battery electric buses for the pilot?

Hydrogen was chosen because it meets minimum requirements without many of the fleet management impacts or hidden costs associated with battery electric buses. It also allows for designing routes for customers, not equipment, and has fewer risks associated with fires. The technology is ready today, and it offers better scalability for a fleet of 100-200 buses.

Environmental and Safety Considerations:

Does TheRide have a carbon neutrality plan or goal? If not, why not? Or, when will they have a plan?

The direction from our Board is that we are to reduce and eventually eliminate our emissions. We are starting with this evaluation of the largest source of our emissions, our bus fleet. Future efforts will focus on support vehicles and our buildings.

What are the environmental impacts of hydrogen fuel-cell buses compared to diesel and battery electric buses?

Hydrogen fuel-cell buses produce zero emissions at the tailpipe. While there are emissions associated with hydrogen production, the goal is to transition to green hydrogen production methods, reducing the overall carbon footprint. Diesel buses emit greenhouse gases and pollutants, while battery electric buses have a carbon footprint associated with electricity production and battery manufacturing.

Are there safety concerns associated with hydrogen fuel-cell buses?

Like all fuels, hydrogen has safety considerations. However, with proper handling, storage, and safety protocols, hydrogen can be used safely. The buses and fueling infrastructure will adhere to strict safety standards.

How will TheRide ensure that the hydrogen used is sourced sustainably?

Initially, hydrogen might be sourced from various methods, but the long-term goal is to transition to green hydrogen, which is produced using renewable energy sources.

Public Involvement and Communication:

What has been the public participation opportunities to date?

A public education effort was conducted from October 19 – November 28, 2022. The initial propulsion research report is available at www.TheRide.org.

How can the public provide feedback on this recommendation?

The public can visit www.TheRide.org for information and feedback opportunities, submit written comments via web form or email, and attend a board meeting in October or November, 2023 to make public comments.

How will the public be kept informed about the progress of the pilot project?

Updates will be regularly posted on www.TheRide.org, and there will be periodic public meetings and announcements to keep the community informed.

Financial and Training Aspects:

How will zero emission buses be funded?

The zero emission buses would need to be funded by a mixture of local, state, and federal funding. Grants from the federal government are the likely source of the majority of the funds, but are not guaranteed and only cover a portion of the costs, and a local share is required.

What will be involved in training employees to maintain zero emission buses?

Training programs have been designed by bus manufacturers to teach bus operators and maintenance technicians about the unique attributes of zero-emission buses. TheRide will work with staff, union representatives, and manufacturers to

define the proper training programs, that may include on-site training by manufactures, off-site training at other transit agencies and at bus manufacturer sites, as well as through programs like 'train the trainer'.

Can TheRide afford to pursue new propulsion as well as the major new capital projects outlined in the Long-Range Plan, such as new passenger terminals and bus rapid transit?

While TheRide has some local funding to contribute, we will need extensive financial support from the federal and state government to pursue all major projects. It may be necessary to set clear priorities and sequence projects so to maximize funding opportunities. All projects will need to be phased in over several years.

Operational and Service Impacts:

How many buses will need to be replaced with zero emission technology?

TheRide has a schedule based on FTA's guidelines of how many years buses may operate and be in service. The plan would be to replace all buses with zero-emission buses over a period of time, possibly 12-20 years.

What is involved in transitioning to zero emission bus technology?

Due to range anxiety, facility retrofits, the economics of mass transit, and staff training considerations, the transition to zero-emissions propulsion will likely impact every aspect of TheRide's operations to some degree. A successful transition requires careful assessment and planning, adequate budgeting, and clear understandings of the risks involved. Board and community support, as well as staff buy in, will be essential.

What is the timeframe to transition to zero emission bus technology?

It will depend on which zero emission option is chosen and available funding. However, the goal will be to replace a certain number of buses per year, determined by which approach is chosen and available funding. Since the lifespan of a transit bus is at least 12 years, a full fleet transition could take 12-20 years.

How will the transition to hydrogen impact fares and services for passengers?

The aim is to transition without impacting fares or services negatively. The pilot project's purpose is to test the feasibility and ensure that services to passengers are not compromised.

Alignment with Broader Goals:

How does this initiative align with broader city or state environmental goals?

This initiative aligns with broader goals by actively reducing carbon emissions, promoting sustainable transit solutions, and setting a precedent for other cities and states to follow.

Note: This Q&A document provides a concise overview of the PowerPoint slide outline on Zero-Emissions Bus Propulsion and the Alternative Propulsion Bus Study. For detailed information, viewers are encouraged to watch the accompanying videos at www.TheRide.org.