

The Green Bus Summit:

What I Learned



Dr. David P. Gatti
Director of Transportation
Granite School District

The Elephant in the Room



- The Federal Government EPA Grant
 - \$5B set aside for cleaner school buses
 - 2.5B specifically for Electric
 - 2.5B for any fuel other than diesel
 - Will be given out over multiple rounds of funding
 - First round is \$500M
 - Closed August 19, 2022
 - Granite School District has applied
 - The EPA has prioritized districts by poverty level
 - We are **NOT** prioritized in the first round, but could be in future rounds



Grant Cycle

Activity	Date
2022 CSB Rebates open . EPA accepts applications submitted via CSB Rebate Forms .	May 20, 2022 – August 19, 2022
EPA reviews applications and begins the selection process	September 2022
EPA notifies applicants of selection status. Selectees can proceed with purchasing new buses and eligible charging infrastructure.	October 2022
Selectees submit Payment Request Forms with purchase orders demonstrating that new buses and eligible charging infrastructure have been ordered	October 2022 – April 2023
Project period deadline for selectees to receive new buses, install eligible charging infrastructure, replace old buses, and submit Close Out Forms	October 2024



Direct from the Messenger



- Esperanza Perez – Tribal Coordinator and School Bus Lead, USEPA
 - There are about 7,800 prioritized entities. Your chances of receiving this grant, even if you are prioritized, is small. If you are not prioritized, your chance is...even smaller.
 - \$500M buys about 1,000 buses. If each selected entity receives 5 buses, only 200 entities will receive buses.



Important Grant Funding Information

School District Prioritization Status	Replacement Bus Fuel Type and Size					
	ZE – Class 7+	ZE – Class 3-6	CNG – Class 7+	CNG – Class 3-6	Propane – Class 7+	Propane – Class 3-6
Buses serving school districts that meet one or more prioritization criteria	\$375,000	\$285,000	\$45,000	\$30,000	\$30,000	\$25,000
Buses serving school districts that are not prioritized	\$250,000	\$190,000	\$30,000	\$20,000	\$20,000	\$15,000



Can It Be Done without Grant Funding?



- Electric buses cost about \$375,000
- Chargers cost about \$20,000 per bus
- Infrastructure cost TBD
- Clean Diesel Buses are about \$160,000
 - Already have necessary infrastructure
- Would need to increase budget about 3-4X current levels to procure the number of buses necessary to keep the operation running.



Cost of Ownership Discussion

Figure 2. Payback Periods for a Hypothetical ESB Project (Clean vs. Baseline) Including and Excluding Purchase Incentives (Discounted Cash Flows)



The Process of Electrification



- Contact the local utility
 - Site study – Most sites are not equipped for high voltage
- Entity and utility complete all upgrades necessary to the infrastructure to deliver high voltage to the site.
 - Utility covers upgrades “behind the meter”
 - The utility may require service contracts for significant upgrades
 - Entity covers upgrades “in front of the meter”



The Process of Electrification Cont'd



- Select buses, chargers, and charge management software
 - State procurement
 - Supply chain issues
- Install charging stations while waiting for delivery of the ordered buses
 - Phase 2 charging vs Phase 3 charging
 - Generally want to rely on phase 2, but want some phase 3 capabilities
- Select routes for electric buses
 - Under 80 miles per day
 - We have 43 of these right now (29% of GSD routes)
- NOW, you are ready to run some electric buses!



Considerations for Electrification



- Charging
 - Off-peak is much cheaper
 - May through October peak: 8AM-11PM
 - November through April 7AM-10PM
- Shop Retrofit
 - Electric buses are heavier
 - May need bigger lift
 - High Voltage DC
 - Must train mechanics – can be VERY dangerous
 - New Systems vs Diesel
 - Must train mechanics
 - What is V2G?
 - May hold big financial incentives
 - Not without risk



Benefits of Electrification



- #1 benefit is improved air quality
 - Point of source (vehicle pollution) is reduced.
 - Diesel technology has improved but still emits particulate matter.
- Fuel Savings
 - If done correctly, there can be a substantial savings
 - Requires Subsidies
 - Look for lower technology costs in the future
 - Etc.
- Buses are generally nicer
 - Can add air conditioning for comparatively inexpensive rates
 - Much quieter
 - Better acceleration



Our Desire to Electrify



- I drive an electric vehicle and can attest to the benefits
- There is undoubtedly an immediate air quality benefit
- The predictions of savings (slide 7) that after year 11 there is a substantial savings on cost of ownership (if grant funding is accessed)
- Without incentives, the total lifecycle cost of ownership at current costs are not recovered
- Granite School District would be considered a leader in clean energy



Timing

- After learning from industry experts
 - There are only 1,738 electric buses in service today in the United States
 - Battery technology will improve
 - Electric buses will become cheaper
 - The 1980s microwave
 - The parable of the \$1M golf ball
 - Only a couple of manufacturers are currently available in Utah
 - Colorado Rack Test Requirement
 - More will pass this test and become competitors
 - Will drive cost down
 - I believe the time to enter the market, in order to get the benefits and mitigate the costs and risks, is about 3-5 years away.

