PO BOX 870
MOSES LAKE, WA 98837
509-765-0898 | 1-888-482-2877
www.granttransit.com

Grant Transit Authority
Fleet Electrification Overview:
Transitioning to Zero Emission Vehicles

This plan was developed to assist with preparing for and transitioning to the electrification of GTA's fixed-route fleet

SECTION I

OVERVIEW of GRANT TRANSIT AUTHORITY

Grant Transit Authority (GTA), the public transportation provider in rural Grant County, Washington, was formed in 1996 as a Public Transportation Benefit Area under RCW 36.57. GTA's PTBA service area covers the entire Grant County spanning 2,660 square miles that is primarily engaged in agriculture, farming, food production, and manufacturing. Grant County is the 4th largest county in the state with a population of just over 100,000, with Moses Lake, Ephrata, and Quincy being the most populated cities. The geography is relatively flat with very hot summers and cold winters.

FACILITIES

GTA's Operations and Maintenance Facility is located at 8392 Westover Blvd NE, Moses Lake, and the Administration offices are located at the downtown Moses Lake Multi-Modal Transit Center located at 116 W 5th Ave, Moses Lake, Washington. GTA has a second, smaller, transit hub located 20 miles to the west in Ephrata, Washington, where connections are made to other parts of the county and nearby regions.

Multi-Modal Transit Center, Downtown Moses Lake

Ephrata Transportation Center, Downtown Ephrata

Operations and Maintenance Facility, Moses Lake

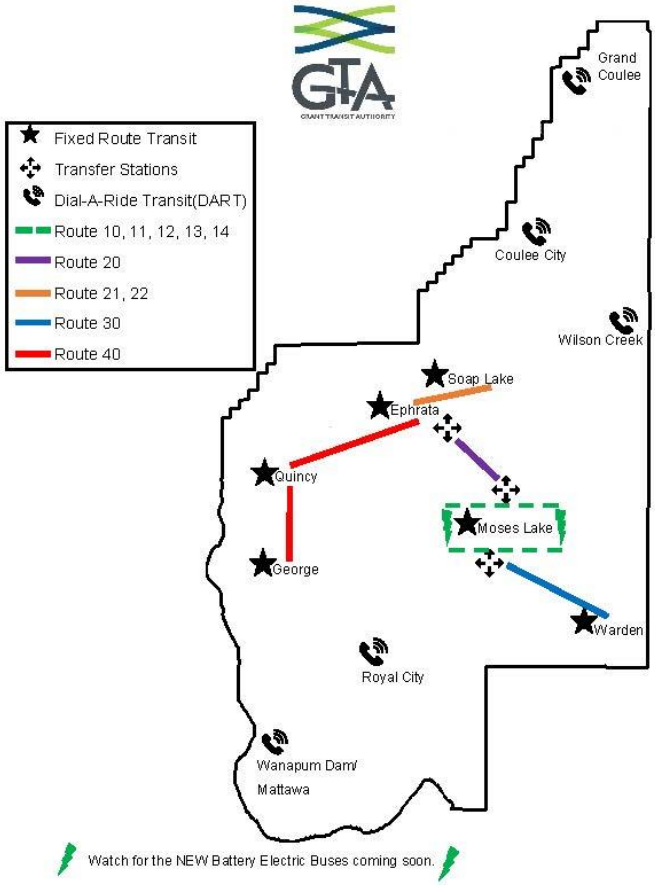
EXISTING FLEET COMPOSITION

GTA's current fleet consists of sixteen (16) 30' and 35' fixed-route diesel coaches and a combination of sixteen (16) diesel, gasoline, and propane cutaways. Ages range from 1 to 18 years old. As the diesel fleet meets its useful life, buses are replaced with propane-powered cutaways and beginning in 2021, battery electric buses. (These numbers represent our 2021 year-end rolling stock fleet inventory)

Gillig 30' & 35' Coaches	16 + (3)
Ford Propane Cutaways	9 + (2)
Ford – Chev Diesel Cutaways	3 - (1)
Ford - Gasoline DART Buses	4
Battery Electric Buses 2022	(4)
Vanpool – 12 Passenger	6
Vanpool – 7 Passenger	6
Ancillary – Gasoline/Diesel	10 - (3)
Ancillary – Electric	(3)

SERVICE AREA

GTA operates ten (10) fixed routes within the more populous areas of Grant County and four (4) DART Routes which provide service to the outlying rural communities of the county not served by fixed route. Routes 11, 12, 13, and 14 were identified to be the service block used for the initial battery electric bus project based on the relatively flat geography, shorter distances traveled, and range of the vehicle. Route feasibility will require adjusting routes, schedules, and vehicle duty cycle.



SECTION II
WASHINGTON STATE LEGISLATIVE DIRECTIVES – Fuel Usage for Publicly Owned Vehicles

RCW 43.19.648
Effective June 1, 2018, RCW 43.19.648 required all local subdivisions of the State of Washington, to the extent determined practical by the Rules adopted by the Washington State Department of Commerce, to satisfy 100% of their fuel usage by operating publicly owned vehicles, vessels, and construction equipment from electricity or biofuel.

EXECUTIVE Order 18-01
Governor's Executive Order #18-01 further solidified *Emissions Reduction Initiatives* with public fleet procurements. Governor Inslee's Executive Order prioritizes battery electric power in the purchase of new publicly owned vehicles.

These directives moved GTA towards exploring alternative fuels, specifically battery electric vehicles.

IDENTIFYING FUNDING SOURCES

Local Sales Tax Revenue
GTA receives 0.2 of 1% of local sales tax revenue generated in Grant County and uses this revenue source for operating costs and providing match on capital grant awards.

WSDOT Green Transportation Capital Grant Program was created by WSDOT in 2019 (RCW 47.66.120) that focuses on providing grant funding to transit agencies for capital projects to reduce the carbon intensity of the Washington State transportation system.

FTA Low-No Award: Initial Battery Electric Bus (BEB) and Charging infrastructure Funding provides funding to state and local governmental authorities for the purchase or lease of zero-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities.

In SFY2018, GTA was awarded funding from the Federal Transit Administration's Low-No Emission Vehicle Program 5339(a) in the amount of $1,330,060, with a committed match requirement of $332,515 and a project total of $1,662,575. This funding was for the purchase of three (3) 30' electric coaches with charging infrastructure to replace older diesel coaches that had surpassed their useful life.

Note: GTA worked closely with the Washington State Department of Transportation and Federal Transit Administration to revise the project scope in resizing the vehicle specifications to four (4) 25' purpose-built battery electric vehicles. This funding and scope revision created the pathway towards zero-emission fleet considerations.

Transitioning to Battery Electric Vehicles will represent a shift in procurement, operations, and maintenance.

SECTION III
VEHICLE AND CHARGING DELIVERY SYSTEMS

Vehicles

Battery Electric Vehicles up to 25' with wireless fast charging capabilities utilizing flush mount in-ground charging platforms for on-route inductive charging and/or plug-in charging were the focus for review. Requirements for consideration included the vehicle passing Altoona testing and meeting FTA Buy America criteria, as well as other federal requirements. GTA researched the following North American transit bus manufacturers evaluating cost, performance, availability, and charging system options:

- Green Power Motors – EV Star — Level II & Optional Fast Charging up to 50kwh
- Motiv Champion — Level II Charging Capability
- Lightning Electric Zero — Level II Charging Capability

Costs averaged from $210k to $260k per vehicle with Level II charging systems.

RECOMMENDATION: It was recommended to the Board of Directors that GTA move towards a purpose-built vehicle that could be charged wirelessly. Other battery electric buses (BEB) were available but had either not passed Altoona Testing or did not meet FTA's Buy America criteria at the time of review. A vehicle built from the ground up allows for precise battery pack placement versus a vehicle conversion.

Charging Delivery Systems

GTA researched Plug-In and Wireless Inductive Charging infrastructure, concluding that wireless in-route Depot Charging provided the best benefits. WAVE and Momentum Dynamics were the two manufacturers of wireless fast charging systems reviewed.

Inductive Charging resulted in:

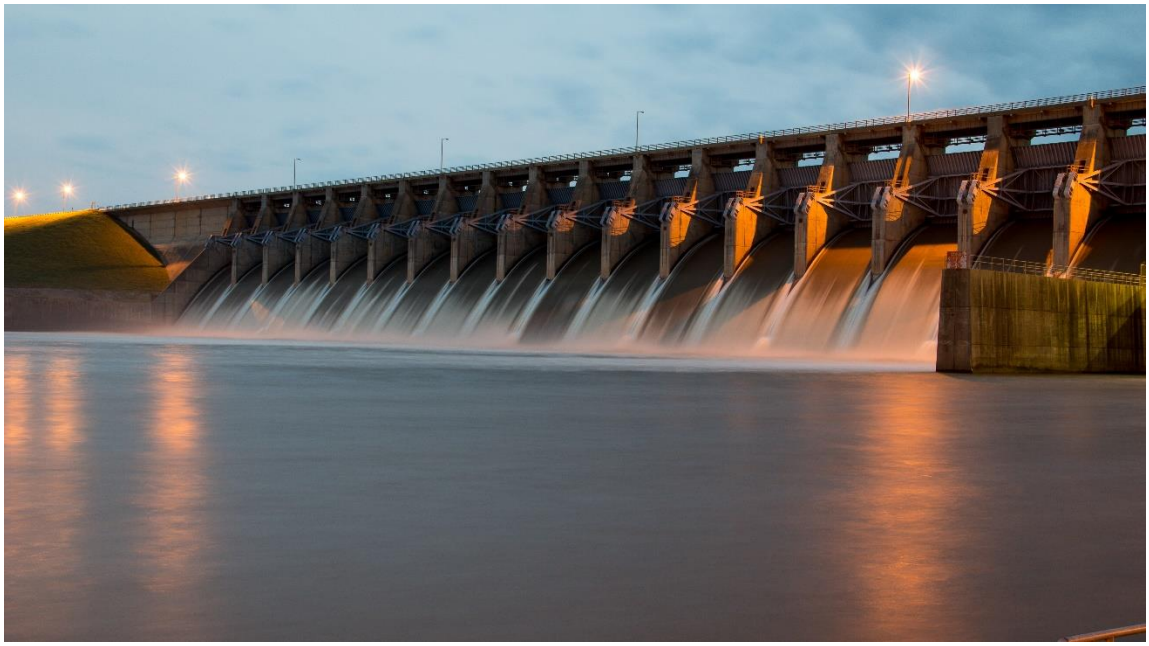
- Higher power
- 1 charger for multiple buses
- No driver involvement = zero driver error
- Charging capabilities throughout the service cycle

Plug-In Charging resulted in:

- Lower power
- 1 charger per vehicle
- Driver involvement = increased driver error
- Removed from service to charge

RECOMMENDATION: It was recommended to the Board of Directors that GTA move towards utilizing wireless inductive charging infrastructure versus plug-in charging.

SECTION IV
ENVIRONMENTAL BENEFITS



Electricity
Hydro-electric power plays an important role in the county's economy, with the Grant County Public Utility District (PUD) producing some of the least expensive electricity in the nation. The PUD is interested in supporting GTA with electrification projects that benefit the region by managing electrical demand and timing impacts to the grid, as well as working on infrastructure improvements to support long-term electrification goals.

AIR QUALITY
Transitioning the fleet to BEBs with GTA's initial project will result in emission reductions of 773.4 lbs. of Co2 and 100.4 lbs. of particulates per diesel coach annually. By significantly reducing greenhouse gas emissions, GTA will help support efforts to improve the air quality in our community.

NOISE POLUTION
Electric buses are much quieter than diesel buses and other vehicles sharing the road. Benefits include a quieter trip for our patrons and a quieter environment for all who walk, bike or live in the neighborhoods we serve.

RECYCLING
Technology has improved to allow for recycling of used batteries once they have met their useful life.

SECTION V
WORKFORCE IMPLICATIONS

Changing technologies will result in additional training needs for Operations and Maintenance staff. Employees will need training prior to the delivery of the first BEB's, with an emphasis on mechanics' understanding and familiarization with high-voltage systems and the daily maintenance of BEBs.

Operations staff will need to be trained and become familiar with: dash controls, start-up and shut-down procedures, inductive charging operations, and safety measures. Training from Original Equipment Manufacturers will be necessary to understand initial and long-term operating requirements associated with the specific technologies.

SECTION VI
MAINTENACE FACILITY AND INFRASTRUCTURE

Construction of the second half of the maintenance building is needed to support future BEB expansion. There are potential savings from designing the second half of the maintenance facility with future consideration for BEB charging and maintenance.

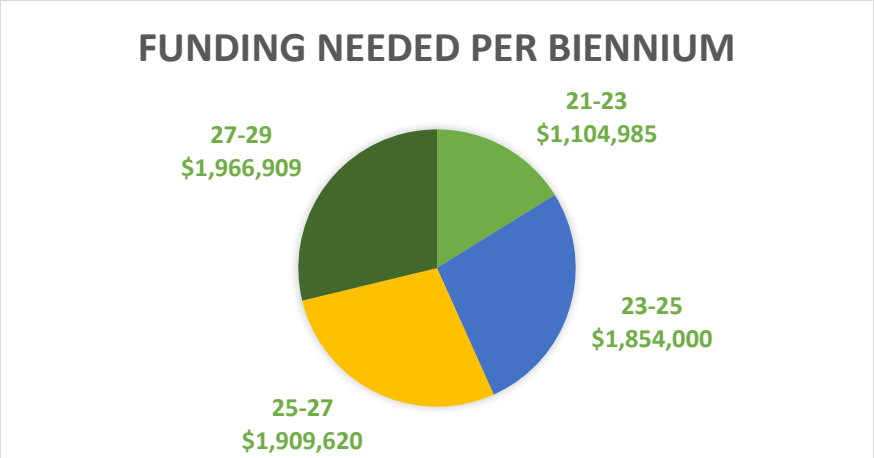
This construction project is in the planning stages. GTA intends to release an Request for Qualifications (RFQ) for Architectural and Engineering Services the first quarter of 2022, allowing GTA to be in a "shovel ready" position while increasing the chance of being awarded grant funding for construction.

GTA intends to submit an FTA 5339 Bus & Bus Facilities Application in 2022, and WSDOT Green Transportation Capital Grant Application during the 2023-2025 biennium to fund the construction phase and additional charging infrastructure for this project.

SECTION VII
FLEET PROCUREMENT - REPLACMENT PLAN - COSTS

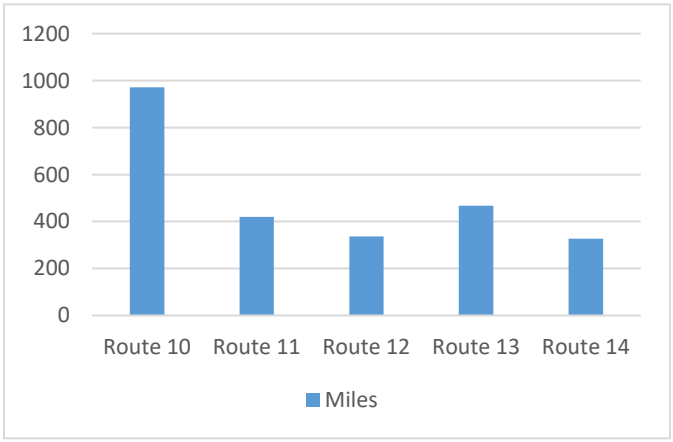
Beginning in 2022, procurement of fixed route buses will be phased in with zero emission-battery electric buses. The last diesel coaches are expected to be purchased in 2022. The graph below identifies the procurement-replacement schedule for existing buses:

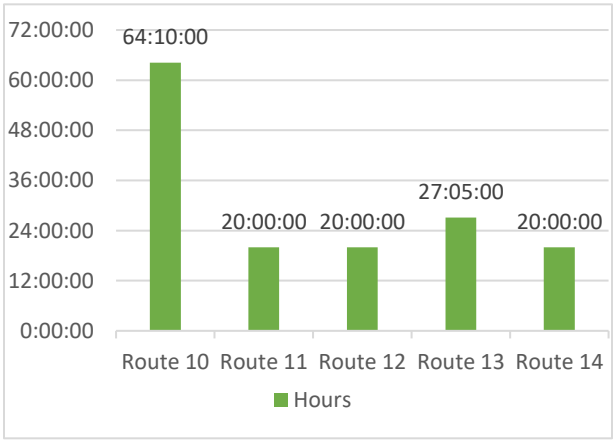
BIENNIUM	Diesel/Propane Buses Replaced	Zero Emission Bus Replacement
21-23	4 – Diesel Buses	4 - 25′ Battery Electric
23-25	3 – Diesel Buses	3 - Battery Electric
25-27	3 – Diesel Buses	3 - Battery Electric
27-29	3 – Diesel Buses	3 - Battery Electric



Route Block Analysis for initial BEB project determined performance requirements including bus size, battery range, and charging requirements. Based on data from the five (5) routes below, it was determined that a vehicle less than 30′ with a range of 100+ miles would work more efficiently than a 30′ coach for routes 11-14. Future expansion to include Route 10 would require a larger capacity bus.

Route	Weekly Miles	Weekly Hours
10	971.1	64:10:00
11	420	20:00:00
12	336	20:00:00
13	468	27:05:00
14	326.4	20:00:00





SUMMARY

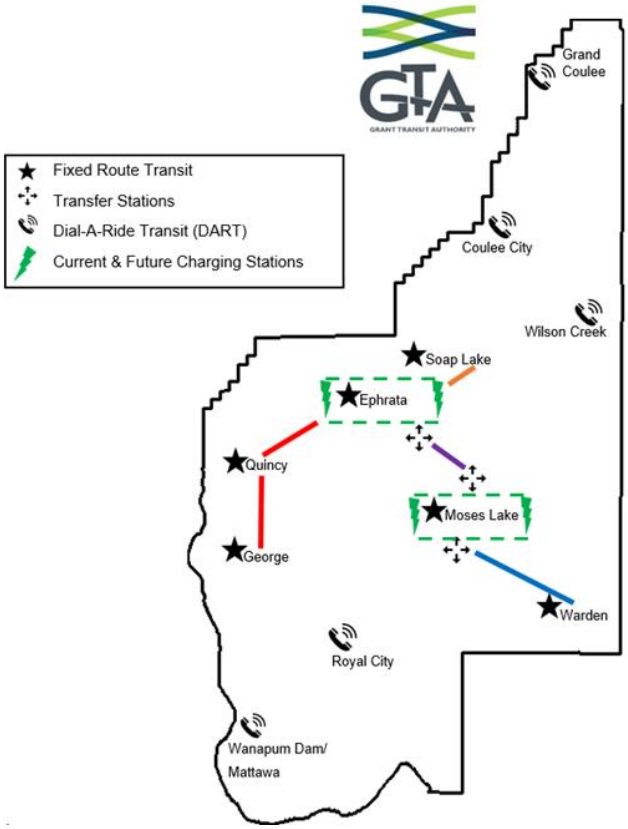
Grant Transit Authority is "charging ahead" to mitigate climate change by lowering its carbon footprint by transitioning to BEB's beginning in 2022. Benefits include lower fuel and maintenance costs compared to diesel buses, improved operating performance, and utilizing a renewable resource generated locally. Communities will benefit by having cleaner air to breathe and less noise pollution.

While GTA is focused on BEBs, it is important to keep abreast of other emerging technologies, such as hydrogen, in the event they become readily available and more cost effective. GTA's new Green Team, an employee driven committee interested in climate change impacts on agency, county, and state levels, will contribute to GTA's commitment to climate change by developing and recommending environmental goals for the agency.

NEXT STEPS

Grant Transit Authority will focus on completing the initial BEB project during the first half of 2022. The next immediate phase of GTA's transition will require Architectural and Engineering services to design the second half of the Maintenance facility to accommodate for BEB maintenance. Additionally, the hiring of a consultant to perform a system-wide analysis will play a key role in GTA moving forward with electrification of the fleet over a period of 20 years.

FUTURE CHARGING LOCATIONS
ROUTES ASSOCIATED WITH NEW CHARGING LOCATIONS



GTA will continue to pursue funding and expertise to expand our zero-emission bus program.