ZERO EMISSION TRANSITION PLAN

2022

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UMPQUA PUBLIC TRANSPORTATION DISTRICT
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UPTD
UMPQUA PUBLIC
TRANSPORTATION DISTRICT

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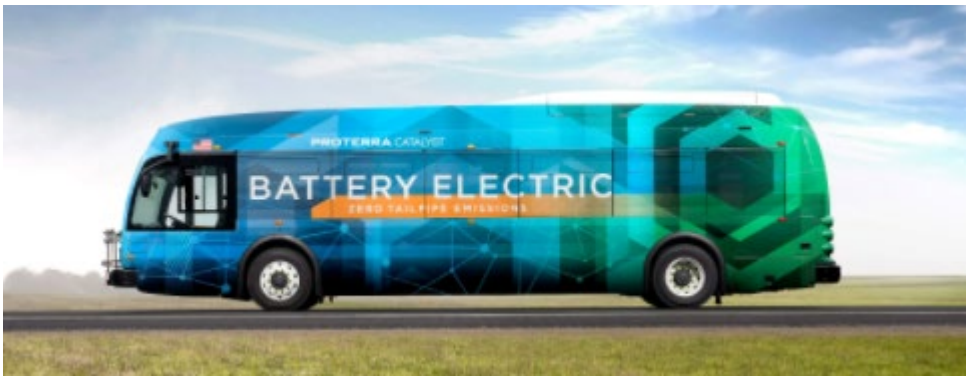
Plan Components

As defined in statute, our Zero-Emission Transition Plan

- Demonstrates a long-term fleet management plan with a strategy for how UPTD intends to use resources for current and future acquisitions.
- Addresses the availability of current and future resources to meet costs for the transition and implementation.
- Considers policy and legislation impacting relevant technologies.
- Includes an evaluation of existing and future facilities and their relationship to the technology transition.
- Describes the partnership of the applicant with the utility or alternative fuel provider.
- Examines the impact of the transition on UPTD's current workforce by identifying skill gaps, training needs, and retraining needs of the existing workers of the applicant to operate and maintain zero-emission vehicles and related infrastructure and avoid displacement of the existing workforce.



ZEV Collaborations

In November 2017, Governor Kate Brown signed Executive Order 17-21 outlining a strategy to foster rapid adoption of zero emission vehicles in Oregon. The strategy includes regulation, charging infrastructure, fleet conversion, outreach, incentives and partnerships with the private sector.

Executive Summary

Umpqua Public Transportation District, UPTD, was created in September of 2018 and is a relatively new District. There are number of converging factors that bring the creation of this plan to the forefront at this time. The intent at both the State and Federal level is rapid implementation of Electric Vehicle (EV) fleets with significant progress by 2035 and Zero Emissions as the goal by 2050. Oregon's Executive Order 17-21 is a driving factor in the creation of an Emission Transition Plan. Funding for implementation of Electric Vehicles and the required infrastructure is now tied to having an Emission Transition Plan in place as well.

UPTD's Zero Emission Transition Plan introduces UPTD as an agency and outlines our current emissions inventory, our emission reduction goals, our fleet management plan and projected implementation of our transition to zero emission vehicles. This plan has been developed as a first step in a succession of ongoing planning efforts that will continue over several years. The intent is to continue building knowledge as we embark on the implementation of the initial steps of the plan and to incorporate new technology as it becomes available. We have included input from our community partners through the outreach and involvement of our Special Transportation Advisory Committee during the development of our Transit Master Plan as well as input from participation in the Umpqua Transportation Electrification Team. The intent of this plan is to create an initial roadmap to begin implementation of the process and ensure compliance with any and all future funding opportunities that require a well thought out plan to achieve zero emissions.

Ongoing planning will take place throughout this next year as UPTD has also been selected to work with ODOT on a pilot project to help agencies with strategies that help to reduce emissions. This project will be a second step in the planning process and will help UPTD develop a much more comprehensive roadmap to continue toward the goal of Zero Emissions. The project has the following summary of benefits:

> *The net-zero consultation pilot will provide consultation services, free of charge, to a small group of transit providers to help them learn how they can reduce greenhouse gas (GHG) emissions from their transit operations. The consultant may also provide agencies with technical assistance to procure and put into service low-emission vehicles and/or create guidance documents, whitepapers, or tools for broader distribution and use.*

What the pilot will provide for participating providers:

- An inventory of the emissions resulting from a provider's entire transit operational profile (i.e. including fleet emissions, building energy use, employee travel, and other factors)

- An GHG emissions reduction plan or proposal, developed in collaboration with the provider, that outlines the best ways for that individual provider to reduce emissions
- Assist provider to develop and apply standards for tracking emissions reductions
- If applicable, advise and support provider to develop feasible emissions reductions targets, possibly including goal dates for completion

UPTD has identified the initial steps necessary to move toward Zero Emissions and will include the knowledge gained in the collaboration with ODOT into the overall plan.

In addition, UPTD has been meeting with community partners as part of the Umpqua Transportation Electrification team which has developed out relationship with, Sam Carter, our local contact with Pacific Power. This relationship gives us ongoing discussion with our utility provider regarding new projects, funding and partnership opportunities.

Currently UPTD owns land, adjacent to our Administrative Facility, that needs to be developed for the implementation of EV's into our fleet. The initial engineering work has identified that it would be optimal to build the EV infrastructure into the development of the land. This is the rationale behind UPTD seeking grants to support the development of the infrastructure at this time. The desire is to install the appropriate voltage in the areas designated for parking and charging. In addition, the Preventive Maintenance Facility will be built with the specific needs of servicing EV's in mind.

As each grant is executed, UPTD will continue to take next steps toward the goal of zero emissions. From site development and implementation of our first Electric Vehicles through fleet replacement over the years to continuous monitoring of progress toward the goal, UPTD will continue to upgrade the Zero Emissions Transition Plan with new technology and new vehicles options as we strive to be the transportation provider of choice for the communities we serve.

Figure 1 – Current Facility with adjacent Proposed Development

UPTD operates a fleet of 14 Diesel Transit Buses, 1 Gasoline Transit Bus and 15 gasoline powered Demand Response vehicles for a total of 30 vehicles. In accordance with our Transit Asset Management (TAM) Plan, vehicles are maintained in a State of Good Repair and replaced after they have reached and exceeded the Useful Life Standards set for Public Transit vehicles. In an effort to begin our transition to lower emissions, 7 of our replacement vehicles currently on order are hybrid replacements.

Replacing smaller Demand Response vehicles with Hybrid Vehicles comes with a significantly higher cost of approximately 25% higher than replacement with gasoline or diesel-powered vehicles. The hybrids on order were $25,000 more than gasoline-powered vehicles. Electric Vehicle options were not available on the State Price Agreement for Class B, 36 passenger vehicles or Class C, 23 passenger vehicles, however, UPTD is able to work directly with an Electric Vehicle Manufacturer for bus

purchases. The replacement cost of 36', 36 passenger diesel buses was $156,000 in 2016. We have been advised to plan for an addition 35% increase for orders placed this year which would replace a 36-passenger with a diesel at approximately $210,000. Replacing a 36-passenger vehicle with an electric bus comes with of price tag of $1,000,000 per vehicle and $97,000 for the charging infrastructure. This result in roughly $110,000 to $220,000 in match requirements for 1 vehicle and charging station.

As a rural agency looking to move toward implementation of EV's, we are dependent on a system that typically awards the EV and infrastructure projects to larger agencies in larger cities where the air quality issues are greater than they are in the more rural areas, however, we are now being held to the same timeframe of implementation of Zero Emission Vehicles to be complete by 2050. We have identified the development of the property as the next step in our plan as it will provide the infrastructure necessary to park, charge and maintain the vehicles and our ability to move forward is directly dependent upon the award of an infrastructure grant.

Introduction

UPTD's service area consists of Douglas County, Oregon which spans 5,134 square miles. UPTD operates hourly fixed route bus service with FTA required complementary Para Transit service in Roseburg, Winston and Sutherlin with commuter bus service to the communities of Winston, Dillard, Myrtle Creek, Riddle and Canyonville. This provides service to communities on a 40 mile stretch of the I-5 corridor. In addition to fixed route service, UPTD provides Demand Response services to the elderly and people with disabilities in the rural communities that are not currently served by fixed route bus service.

UPTD's role is to provide the public with reliable mobility. In doing so we are responsible for operating efficiently and being good stewards of the limited public resources entrusted to us. Goals on sustainability, reduced environmental influences, and increased efficiency are set by each agency. However, deciding on and finding the right tools to achieve these goals can be a challenge. The purpose of this plan is to provide a snapshot of UPTD's system today, utilizing tools and information available to us and identify the initial steps required to move toward and transition to zero-emissions. In addition, we will show the benefits to our community when implementing a zero-emissions system.

Scope

The scope of this plan is to define the initial steps in UPTD's path toward zero emissions and outline the ongoing processes involved in executing our project as a whole with the understanding that, although the plan is driven by the State and Federally set goals, the project is constrained by the availability of funding. UPTD will continue to set aside STIF match funds to ensure there is adequate match when funding opportunities arise.

Facilities Assessment

The current facility is at full capacity for parking and does not have the option to expand or implement charging options for the fleet, however, once an operations facility is developed, the parking spaces at the Administration building could have pedestal chargers installed for guest parking.

The proposed facility would initially support 3 Battery Electric Buses (BEB's) with 3 plug-in style Pedestal charging stations as shown in **Figure 2.** The parking structure would be designed to adjust to upgrades as the number of BEB's increases. Scaling to a fleetwide BEB deployment requires a substantially different approach to charging and infrastructure upgrades. Plug-in charging is typically no longer practical as charger dispensers installed in the parking area creates a hazard.

Figure2 – Plug-In Pedestal Charger Example

Figure 3 – Pantograph Dispenser

Instead, the preferred approach is to use overhead pantograph or reel dispensers attached to gantries or to the existing overhead roof structure for facilities that are covered as shown in Figure 3. It would also be necessary to plan for at least two charging windows as the number of BEB's in the fleet increases the charging demand.

The proposed parking project includes 24 double-length, pull through spaces that would accommodate 48 Class B 35' buses which is more than double our current fleet and would accommodate current plans to expand services. In addition, there are parking spaces available to accommodate the Demand Response vehicles which would remain on the Pedestal style chargers.

When UPTD is able to build a downtown Transit Center, it would need to be evaluated for the appropriate quick charge option to provide charging throughout the day.

Emissions inventory

Using the FTA Transit Greenhouse Gas Emissions Estimator v2.0 we show our Vehicle Miles Traveled per mode below in order: Commuter Bus, Fixed Route Bus, Demand Response, Medical Transportation Personally Owned Vehicles.

Operation Mode	Fuel Source	eGrid Subregion (if applicable)	VMT
Bus/BRT	Diesel		152,655
Bus/BRT	Diesel		155,484
Vanpool	Gas		168,500
Sedan/Auto	Gas		316,000

Figure 4 – Current Vehicle Miles Traveled by Mode

Using 30 years as the analysis period, the following shows the Total GHG Emissions over 30 years.

Total GHG Emissions Over Analysis Period in MTCO2eq	Upstream Materials	Upstream Transport	Downstream	Total
Construction	0	0	0	0
Transitway Maintenance	0	0	0	0
Facility Operations	0	0	0	0
Vehicle Operations	6,923	0	33,117	40,040
Vehicle Maintenance	0	0	563	563
Displaced Emissions	6,616	0	31,210	37,825
Cumulative Emissions	307	0	2,469	2,777

Figure 5 – 30 Year GHG Table using current vehicle type

By changing the Fixed Route Buses, at current VMT, to electric we see the following reduction over 30 years:

Total GHG Emissions Over Analysis Period in MTCO2eq	Upstream Materials	Upstream Transport	Downstream	Total
Construction	0	0	0	0
Transitway Maintenance	0	0	0	0
Facility Operations	0	0	0	0
Vehicle Operations	6,923	0	33,117	40,040
Vehicle Maintenance	0	0	563	563
Displaced Emissions	9,036	0	19,553	28,590
Cumulative Emissions	-2,114	0	14,126	12,012

Figure 6 – 30 Year GHG Table using electric vehicles for fixed route

Currently, all of UPTD's vehicles operate using gasoline or diesel fuel. With this as the starting point, UPTD will be able to continuously monitor and evaluate our greenhouse gas emissions and our progress toward net zero emissions as we replace our vehicles with Hybrids and Electric vehicles.

In addition to tracking the reduction in emissions, we are tracking the preventive maintenance costs associated with all vehicles in our fleet. We will continue to track to show the reduction in preventive maintenance costs associated with Hybrid and Electric vehicles.

Emissions Goals and Targets

The simplified end goal is to reach Zero Emissions by 2050. This includes, not only our vehicle operations and maintenance, but our construction and facility operations as well. As we complete our construction project, we will ensure landscaping and vegetation meets the appropriate standards to play an active role in reducing emissions.

Complete:

- Purchase of land to develop for parking, preventive maintenance, washing and charging vehicles
- Order lower emission replacement Demand Response vehicles.

In Process:

- Receive the Hybrid vehicles currently on order
- Participate in the ODOT Pilot Project to create a more thorough emissions inventory

All other targets are dependent of the funding for the construction:

- Construct Parking Facility with 3 Plug In Pedestal Chargers
- Receive 3 Electric Buses to deploy on the Fixed Routes
- Identify additional match sources to continue replacing vehicles as they age out

Fleet Management Plan and Strategy

Vehicles that are currently on order were replaced with the Fuel Type available for the funding that was available. Our strategy going forward will be dependent upon development of the property that will allow the integration of EV's with the current fleet and a gradual change over time to an entirely Electric Fleet as vehicles age out and additional funding options present over the years.

In keeping with our TAM Plan, we will seek grant funding to replace the three 2011 and three 2014 vehicles during the 2023-25 grant cycle. We will see an appropriate level of funding to replace these gasoline vehicles with either Hybrid or Electric. These vehicles were transferred to UPTD through the formation of the District, and serve our most rural areas of the county. The decision between Hybrid and Electric replacement will be driven partially by the range of the electric vehicle with the additional electrical drain of the ADA lift included as a factor.

The four 2019 Ford F-550 Super Duty, 23 Passenger Buses are utilized primarily on the South County, rural commuter routes. These routes are high mileage with buses traveling a minimum of 100 miles/day and a maximum of 400 miles/day. These vehicles are due for replacement in 2026 at the 7 year, 150,000 mile mark. History shows that these vehicles will be nearing the 300,000 mile mark by the time replacements are received. By 2026, the options for replacing small cutaways with electric should be improved. The decision between Hybrid or Electric will be driven by range for these vehicles. We may find we need to replace these buses with diesel or hybrid in 2026 and look to the second replacement at end of useful life, near 2035, as the target for the zero emission vehicles.

The five 2016 International Starcraft buses are not due for replacement until 2026. These are the vehicles that would be the best choice to go electric. These vehicles are used on the fixed routes that run in Roseburg, Winston and Sutherlin. These vehicles are the most costly to maintain and we would see the greatest reduction in preventive maintenance costs by replacing these with all electric buses.

Current UPTD Fleet

Vehicle ID	Year, Make, Model, Passenger, ADA	Status	Condition	Replacement Status	Fuel Type
11-03-08 1FDXE45F33HA90413	2003 Ford E- Series, 14 Passenger, 1 ADA	Backup Vehicle	Poor	Replacement Ordered	Hybrid
11-07-02 1GBE5V1237F416141	2007 Chevrolet C5500, 23 Passenger, 2 ADA	Backup Vehicle	Poor	Replaced	
11-09-04 1FTSS34L49DA37910	2009 Ford E350 Van, 5 Passenger, 1 ADA	In Service	Good	Replaced	
11-09-06 1GBG5U1968F414577	2008 Chevrolet C5500, 23 Passenger, 2 ADA	Backup Vehicle	Marginal	Replacement Ordered	Diesel
11-10-04 1FTSS3EL3AD62817	2010 Ford E350 Super Duty Van, 5 Passenger, 1 ADA	In Service	Poor	Replacement Ordered	Hybrid
11-11-03 1N9FLACL85C084247	2005 Eldorado Bus, 30 Passenger, 2 ADA	In Service	Poor	Replacement Ordered	Diesel
11-16-15 5WEASC8P5GH453055	2016 International Starcraft Bus, 36 Passengers, 3 ADA	In Service	Adequate	2026 - 10 Years	
11-16-16 5WEASC8P9GH453057	2016 International Starcraft Bus, 36 Passengers, 3 ADA	In Service	Adequate	2026 - 10 Years	
11-16-17 5WEASC8P0GH453058	2016 International Starcraft Bus, 36 Passengers, 3 ADA	In Service	Adequate	2026 - 10 Years	
11-16-18 5WEASC8P2GH453059	2016 International Starcraft Bus, 36 Passengers, 3 ADA	In Service	Adequate	2026 - 10 Years	
11-16-19 5WEASC8P9GH453060	2016 International Starcraft Bus, 36 Passengers, 3 ADA	In Service	Adequate	2026 - 10 Years	
11-17-09 1FDFE4FS6GDC33147	2016 Ford E450, 16 Passengers, 3 ADA	In Service	Good	Replacement Ordered	Hybrid
18-19-01 1FDAF5GT7KDA19233	Bus · 2019 Ford F-550 Super Duty	In Service	Good	2026 - 7 years	
18-19-02 1FDAF5GT5KDA17853	Bus · 2019 Ford F-550 Super Duty	In Service	Good	2026 - 7 years	
18-19-03 1FDAF5GT9KDA19234	Bus · 2019 Ford F-550 Super Duty	In Service	Good	2026 - 7 years	
18-19-04 1FDAF5GTOKDA19235	Bus · 2019 Ford F-550 Super Duty	In Service	Good	2026 - 7 years	
18-20-01 1FBVU4X81LKA10269	2020 Ford Transit Van, 10 Passenger, 4 ADA	In Service	Good	2024 - 4 years	
18-21-01 3C6MRVUG8ME518504	2021 Ram ProMaster Van, 10 Passenger, 2 ADA	In Service	Excellent	2025 - 4 years	
18-21-02 1FTDS3EL8EDA22361	2014 Ford E350 Econoline, 8 Seats, 2 ADA	In Service	Adequate	Replace 2023	
18-21-03 1FTDS3EL5BDB13879	2011 Ford E350 Econoline, 8 Seats, 2 ADA	In Service	Poor	Replace 2023	
18-21-05 1FTSS3ELXBDB36834	2011 Ford E350 Econoline, 8 Seats, 2 ADA	In Service	Poor	Replace 2023	
18-21-07 1FTDS3EL2EDA22355	2014 Ford E350 Econoline, 8 Seats, 2 ADA	In Service	Adequate	Replace 2023	
18-21-08 1FTDS3EL2BDB35931	2011 Ford E350 Econoline, 8 Seats, 2 ADA	In Service	Poor	Auction - Title	
18-21-09 1FTDS3EL6EDA22360	2014 Ford E350 Econoline, 8 Seats, 2 ADA	In Service	Adequate	Auction - Title	
18-21-10 1FDVU4XM6JKA73756	2018 Ford Transit, 9 Seats, 2 ADA - Mercy	In Service	Good	Replace 2024-25	

Figure 7 – UPTD Fleet Table

Implementation and Monitoring

Implementation of this plan will be an ongoing project over many years. UPTD staff will bring new information to the Board for consideration when plan updates may be warranted and will set an annual progress report for review of the implementation process with discussion surrounding milestones achieved and barriers to forward progress.

As the technology changes within our fleet, it will be important for UPTD to continue to train employees to proficiency. As new vehicles are brought into the fleet, managers, supervisors and drivers will receive the appropriate training to ensure safe operation of the vehicles with particular emphasis on working with electric vehicles, hydrogen fuel cell and other zero emission options that we incorporate into our fleet.

When our Preventive Maintenance Facility is complete, our maintenance staff will need ongoing training to ensure they are knowledgeable about all aspects of working with high voltage equipment and other specialized equipment specific to new alternative fuel sources. UPTD will ensure all required certifications are completed and ongoing training takes place as needed to stay up to date. UPTD will also make training available for local First Responders to ensure that they are aware of the dangers associated with responding to an incident involving one of UPTD's vehicles.

As we transition our fleet to electric, hydrogen fuel cell or other zero emission options, all staff will receive training to proficiency with ongoing safety training as a requirement of all employees. Staff retention is important to UPTD and the intent is to ensure that every employee receive the appropriate training that they need to be successful.

Adoption and Updates

Adopted – 4/25/2022
Amended to include Hydrogen Fuel Cell and all other alternative fuels – 6/13/2022