Union City Transit:
FTA Zero-Emission Fleet Transition Plan

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Introduction

Union City Transit developed this Zero-Emission Fleet Transition Plan to meet the requirements of 49 U.S.C. 5339(c)(3)(D) for applicants to the FY2022 Low or No Emission Grant Program (Low-No) and the Grants for Buses and Bus Facilities Competitive Program (B&BF). This fleet transition plan was developed specifically for this application and includes reference to the project(s) requesting FY22 funding.

The plan is divided into six sections, addressing each of the following elements outlined by Federal Transit Administration (FTA):

1. **Fleet Assessment:** Demonstrate a long-term fleet management plan with a strategy for how the applicant intends to use the current request for resources and future acquisitions.
2. **Funding Needs Assessment:** Address the availability of current and future resources to meet costs for the transition and implementation.
3. **Policy Assessment:** Consider policy and legislation impacting relevant technologies.
4. **Facilities Assessment:** Include an evaluation of existing and future facilities and their relationship to the technology transition.
5. **Partnership Assessment:** Describe the partnership of the applicant with the utility or alternative fuel provider.
6. **Workforce Analysis:** Examine the impact of the transition on the applicant'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.

Element 1: Fleet Assessment

Fleet Assessment Overview

The Fleet Assessment determines a projected timeline for replacing existing buses with zero-emission buses (ZEB) that stays consistent with Union City Transit's current fleet replacement plan. This assessment also includes a projection of vehicle capital costs over the transition timeline.

City of Union City – Union City Transit adopted the alternative fuel path in 2000 with the California Air Resources Board (CARB). As part of this adoption, Union City Transit chose to transition to compressed natural gas (CNG) with an initial implementation deadline of December 31, 2012. Union City Transit met this deadline. Union City Paratransit was fully transitioned to CNG in 2009 only to later find out that gasoline was considered a clean fuel several years later.

Union City Transit is budgeted for eighteen (18) fixed-route buses with a peak pull of up to fourteen (14) buses prior to the Covid-19 pandemic; all eighteen (18) are/were low-floor CNG vehicles ranging in model years from 2008, 2010, 2012, and 2016. Union City Paratransit is budgeted for seven (7) vehicles with a peak pull of six (6) vehicles prior to the pandemic, but the vehicle fleet is actually budgeted for eleven (11) with four (4) vehicles used in a program Union City participates in only administered by the neighboring City of Fremont; the vehicles are a mix of seven (7) gasoline and four (4) electric unibody and cutaway vans ranging in model years 2019, 2020, 2021, and 2022 with two (2) of the aforementioned four (4) electric vehicles planned for delivery later in 2022. Union City Fleet (microtransit) is currently budgeted for three (3) vehicles with two (2) in current peak service; all three (3) vehicles are gasoline unibody vans from model year 2021.

The remaining four (4) CNG fixed-route buses due for replacement in 2016 may not get replaced by buses and may instead require smaller microtransit vehicles to replace them.

The first step in the Fleet Assessment is determining the schedule for replacing Union City Transit's current fleet with ZEBs. For the purpose of the FY22 Low-No and Buses and Bus Facilities applications and based on Union City Transit's goals and current fleet replacement plan, Union City Transit developed the following Annual ZEB Purchase Schedule presented below in **Table 1.**

Table 1: *Annual ZEB Purchase Schedule*

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Number of Buses Scheduled to Enter Service	1	10	6	0	2	8	0	5	2	6	0	0	5	16	7	0	2	6	0
Number of ZEBs Scheduled to Enter Service	1	10	6	0	2	8	0	5	2	6	0	0	5	16	7	0	2	6	0
ZEB Percentage of New Buses	100%	100%	100%	0%	100%	100%	0%	100%	100%	100%	0%	0%	100%	100%	100%	0%	100%	100%	0%

In this schedule, a vehicle is replaced with a Battery Electric Vehicle if the replacement vehicle has come to the end of its scheduled useful life. This assessment assumes that the fleet will remain the same size throughout the period of transition to a zero-emission fleet.

Based on the Annual ZEB Purchase Schedule, Union City Transit will procure the agency's first ZEBs in 2022, purchase ten (10) ZEBs in 2023 (eight [8] 35' transit buses and two [2] paratransit vehicles), six (6) in 2024, and fifteen (15) in 2025-2029 to complete the transition to zero-emissions before 2030. Union City Transit's FY22 Low-No and Buses and Bus Facilities projects are reflected in the 2023 and 2024 procurement years.

Key Results

Figure 1 shows Union City Transit's projected purchases by year including the number and type of bus propulsion through 2040. The proposed 14 battery electric buses as part of FY22 Low-No and Buses and Bus Facilities project(s) are reflected in **Figure 1,** with Union City Transit procuring eight (8) in 2023 and six (6) in 2024. Note that two (2) electric paratransit vehicles are shown as 2023 procurements and are already funded separately from the FY2022 Low-No request. By following the vehicle procurement cycles for each of Union City Transit's 32 vehicles and only purchasing ZEBs from 2022 on, Union City Transit plans to reach a full fleet of 100% ZEBs by 2029 when the last fossil fueled vehicle is replaced.

Figure 2 depicts Union City Transit's proposed annual fleet composition through 2040 as it phases out previous vehicle propulsion technologies for ZEBs. By 2029, the agency's fleet reaches 100% ZEBs.

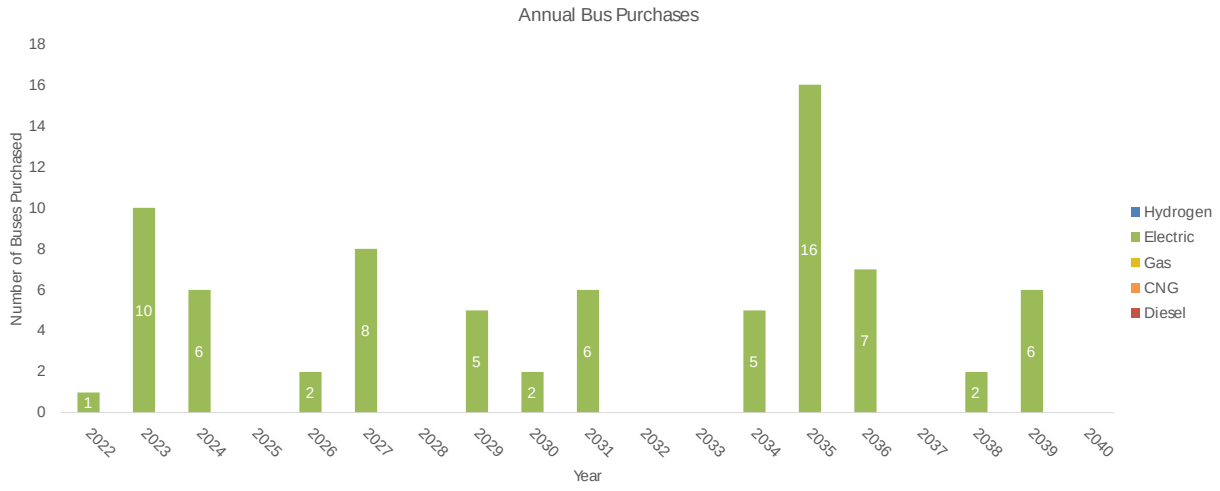

Figure 1: *Projected Bus Purchases*

Figure 2: *Annual Fleet Composition*

Cost Assumptions

Key assumptions for vehicle costs for the Zero-Emission Fleet Transition Plan are as follows:

- Vehicle costs are based on the agency's most recent procurement price for standard vehicle propulsion technologies and industry averages for zero-emission technologies;
- Vehicle costs are inclusive of estimates for configurable options and taxes;
- Vehicle cost includes estimate for extended battery warranty, allowing for a mid-life battery replacement;
- Vehicle costs do not include inflation.

Figure 3 shows the annual capital costs for vehicles purchased in a given year through 2040. The projected transition to ZEBs is completed with the 2029 replacements so data through 2040 shows replacements of some ZEBs with new ZEBs. The estimated total cost for vehicles over the designated transition period is $25.6M through 2029 when the fleet reaches 100% ZEBs. The total cost through 2040, which includes some replacements of ZEBs, is $51.1M. Costs are incurred from the annual ZEB purchases laid out in the fleet replacement plan.

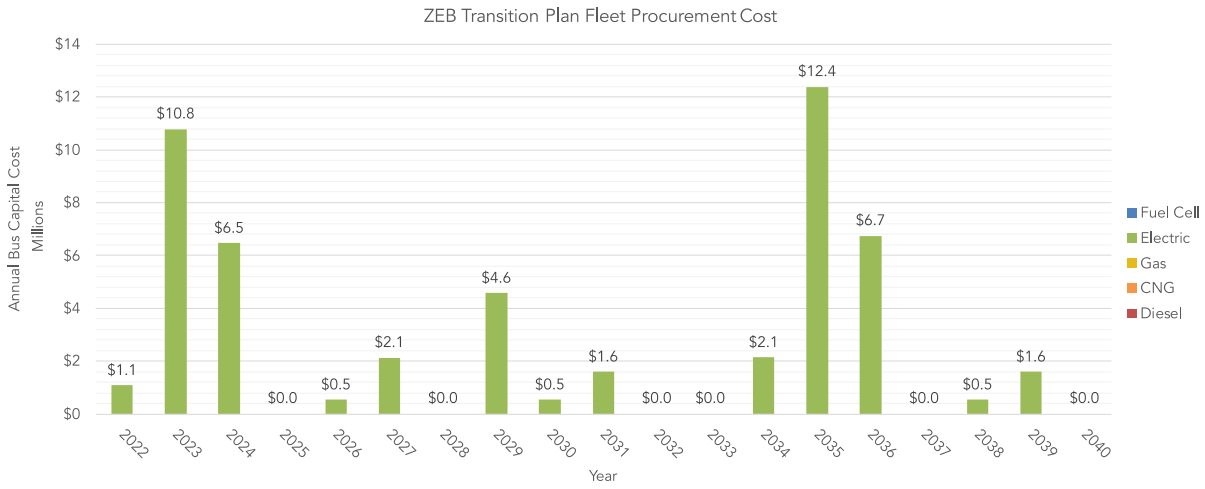

***Figure 3** – Annual Capital Costs*

Conclusion

Union City Transit is expected to complete transitioning to a zero-emission fleet by 2029. The expected total capital cost of vehicles for the transition to a ZEB fleet is estimated at $25.6M (the cost of replacements through 2029).

Element 2: Funding Needs Assessment

Funding Assessment Overview

Union City Transit allocates funds based on an established procurement timeline determined by the useful life of its buses. Transitioning to a zero-emission bus fleet increases overall fleet costs because of the incremental cost of zero-emission buses, the installation of new infrastructure, and required modifications to maintenance facilities. The current market cost of zero-emission buses is between $750,000 and $1,200,000, which is approximately $250,000 to $700,000 more expensive than diesel buses. Additionally, the necessary infrastructure to support these zero-emission buses adds to the financial burden of transitioning to a zero-emission fleet.

For the purposes of the Zero-Emission Fleet Transition Plan, vehicle costs and infrastructure costs are assessed individually in the Fleet and Facilities Assessments. The results of those cost assessments are compiled here as total costs and then compared to Union City Transit's budget to better understand funding gaps and needs.

Union City Transit Funding Needs

Over the course of the eight-year transition period, Union City Transit plans to deploy thirty-two (32) Battery Electric Buses, consisting of eighteen (18) full size transit buses and fourteen (14) paratransit cutaway or unibody style vehicle. Through 2022, there are already three (3) paratransit vehicles funded without charging infrastructure; these vehicles share other public charging stations not dedicated to transit fleet use.

To meet the goal of a zero-emission vehicle transition by 2029 and move toward a successful deployment of zero-emission buses, Union City Transit projects will require $25.6M in capital costs for BEBs and $4.1M for charging infrastructure, totaling procurement expenditures of $29.7M. This cost estimate includes the necessary costs for the transition, as determined via the cost analyses completed for the Fleet and Facilities Assessments.

Available Funding Resources & Resulting Funding Shortfalls

Based on the funding needs identified above and an assessment of Union City Transit's current projections, Union City Transit has identified resources that can cover this funding gap. Six different local, state, and federal programs are being pursued to fund for zero-emission vehicle transition procurements:

- Secured California State Low Carbon Transit Operations Program (LCTOP) funding as part of annual regional allocation from the Metropolitan Planning Organization (MPO), locally Metropolitan Transportation Commission (MTC); annual allocations fluctuate between $95K and $160K and have four years of roll over. Funds have been requested for EV vans and EV charging infrastructure.
- Semi-secured discretionary regional funds from the Alameda County Transportation Commission (ACTC) through the Transportation for Clean Air Fund (TFCA) and Vehicle Registration Fees (VRF) in an amount not to exceed $1.5 Million for EV charging infrastructure.
- Secured FTA 5307 funds for two (2) EV paratransit vans and the majority of eight (8) EV buses in an amount around $5.1 Million. Would like to defer funds to pay for buses in 2024.
- Semi-secured State Bridge Toll Revenues (AB664) as local match for FTA funds in an amount around $343K.
- Semi-secured Regional Funds from Regional Transportation Plan/Long Range Plan (RTP-LRP) as local match for FTA funds in the amount of $2.8 Million, programmed for 2025.
- Secured local funds through Transportation Development Act (TDA) capital funds with a reserve balance in excess of $10 Million for combined operations and capital needs.

Beyond traditional formula funding and the other programs outlined above, Union City Transit will need additional funding for future onsite energy generation and storage to supplement demand as fleet grows. Union City Transit is prepared to pursue funding opportunities at the federal, state, and local levels, as necessary and as available.

Element 3: Policy Assessment

Policy Assessment Overview

Policies and regulations supporting the transition to zero-emission are proliferating as the efforts to decarbonize the transportation sector expand. Union City Transit is monitoring the implementation of relevant policies and legislation. While relevant funding programs are considered in the Funding Needs Assessment above, policies and regulations that direct aspects of zero-emission transit deployments beyond funding are considered in this section. Union City Transit will thoroughly assess all relevant policies and legislation throughout the fleet transition.

Alignment with Federal Priorities and Policies

With the passage of the *Bipartisan Infrastructure Law* and *Executive Order 14008: Tackling the Climate Crisis at Home and Abroad*, the federal government has set a renewed focus on zero-emission transit. Union City Transit's goal to deploy a fully zero-emission vehicle transit fleet by 2029 supports the federal administration priorities of safety, modernization, climate, and equity for public transportation. Union City Transit's primary intent is to use any federal discretionary funding through the FTA to assist with modernizing its fleet with new features and functions to improve maintenance, drivability, and the customer experience. Union City Transit's secondary intent is to use any federal discretionary funding through the FTA to assist with meeting local and state climate goals to reduced localized and regional emissions for the health and comfort of the residents of Union City and the customers of Union City Transit. Union City Transit has always prioritized ensuring safety within the service for the workers and customers while also ensuring that the service is available to as many residents as possible

California Policies & Goals

Union City Transit is subject to the California Air Resources Board (CARB) Innovative Clean Transit (ICT) Regulation, but has a deferred implementation because it is a small fleet. Union City Transit has been pursuing fleet electrification since 2018 to take advantage of available funding opportunities with minimal success.

Electric transit vehicle procurements have been hampered by a lack of consistent cost for the vehicle and technology. In the region's Transit Capital Priorities (TCP) Program, EV and Hydrogen bus prices along with their infrastructure costs have been absent from the program until recently after some operators in the region were successful in getting early grant funding to convert. This has made acquiring FTA funding in sufficient amounts challenging because an entity can only request up to the most expensive vehicle in the program (for Union City that was a diesel hybrid bus).

CARB recently announced an accelerated plan to transition to zero-emission vehicles (ZEV) by making it a requirement that 35% of all new vehicles sold in 2026 need to be ZEVs. There is also a goal set by the Governor of California to switch municipal fleets to ZEVs by 2030 or 2035.

Support for Local Policy Goals

The City of Union City included *Union City Transit* in its 2010 Climate Action Plan as a way to reduce localized greenhouse gas emissions. At the time, the suggestion was to convert to diesel-hybrid buses when the service was already operating compressed natural gas (CNG). This policy was revisited in 2020 when City of Union City included Union City Transit fleet electrification as one of its strategic goals in the 2020 Strategic Plan. Including the transit fleet in the 2020 plan reaffirmed this with a resolution of commitment to electrifying Union City Transit. The City of Union City prefers not to work with volatile fuels like Hydrogen due to an incident with an Air Liquide facility several years ago; the City supports Battery Electric Buses as an alternative.

The City of Union City is located in Alameda County, CA; the Environmental Protection Agency (USEPA) considers Alameda County a non-attainment area.

Element 4: Facilities Assessment

Facilities Assessment Projects

The following section introduces the timeline and cost estimates for the infrastructure associated with Union City Transit's transition to battery electric buses.

Union City Transit's Current Facilities

Union City Transit currently parks, fuels, and washes its vehicles at the Union City Public Works Maintenance Facility (Corporation Yard) where dedicated reinforced concrete bus pads were installed to accommodate the weight of the fixed-route buses. The Corporation Yard has onsite capabilities to fuel the current compressed natural gas (CNG) fleet. Because the bus pads are already reinforced for the fleet of eighteen (18) buses, the bus stalls are expected to be restriped to accommodate chargers in between every other bus to reuse the existing infrastructure effectively. There are no current plans to build new facilities for Union City Transit; instead, existing facilities will be upgraded to support the ZEB fleet transition.

Battery Electric Bus Facilities Assessment Overview

Scaling to a fleetwide battery electric bus deployment requires substantial infrastructure upgrades and a significantly different approach to charging compared to smaller deployments. With initial deployments, charging requirements are met relatively easily with a limited number of plug-in pedestal chargers and minimal infrastructure investment.

Full fleet deployments of battery electric buses, however, require installation of a significant number of charging stations and improvements to existing electrical infrastructure. These improvements may include upgrades to switchgear or service connections. Planning and design work, including development of detailed electrical and construction drawings required for permitting, is also necessary once specific charging equipment has been selected.

To determine the installation timeline and costs for charging equipment, this assessment breaks the infrastructure scope of work into three key project types: planning, power upgrades, and charging equipment (charger and dispensers) installation. Estimated costs associated with each project type are included in **Table 2**.

Table 2: Battery Electric Bus Infrastructure Project Cost Assumptions

Project	Estimate Metrics	Cost Estimate	Source
Infrastructure Planning	Infrastructure Design and Planning	$200k per project	Engineer's estimate
Power Upgrade Projects	Design, Construction, & Equipment	Variable ($200k-$400k) per project dependent on capacity added	Engineer's estimate, includes 20% contingency
Charging Installation Projects	Charging Equipment & Installation	$132k per 150 kW charger $12k per dispenser	Quotes and estimates, includes 20% contingency

Key assumptions applied in the agency's Facilities Assessment are as follows:

- One plug-in dispenser per bus;
- Two buses per 150 kW charger;
- Two charge windows, i.e., no more than half the buses charge at any given moment;
- Incremental power requirements are met over time. Power upgrades are consolidated to occur in selected years, in accordance with the required demand; and
- Dispenser capacity to serve up to 80% of the fleet at a time; no movement of buses overnight.

Battery Electric Bus Infrastructure Cost Summary

Figure 4 summarizes all costs for charging infrastructure for Union City Transit's transition to a battery electric bus fleet. The estimated total infrastructure costs are approximately $4.1M. This total cost includes power upgrade projects, charger and dispenser installations, planning projects, design-engineering costs, and a 20% contingency on all costs.

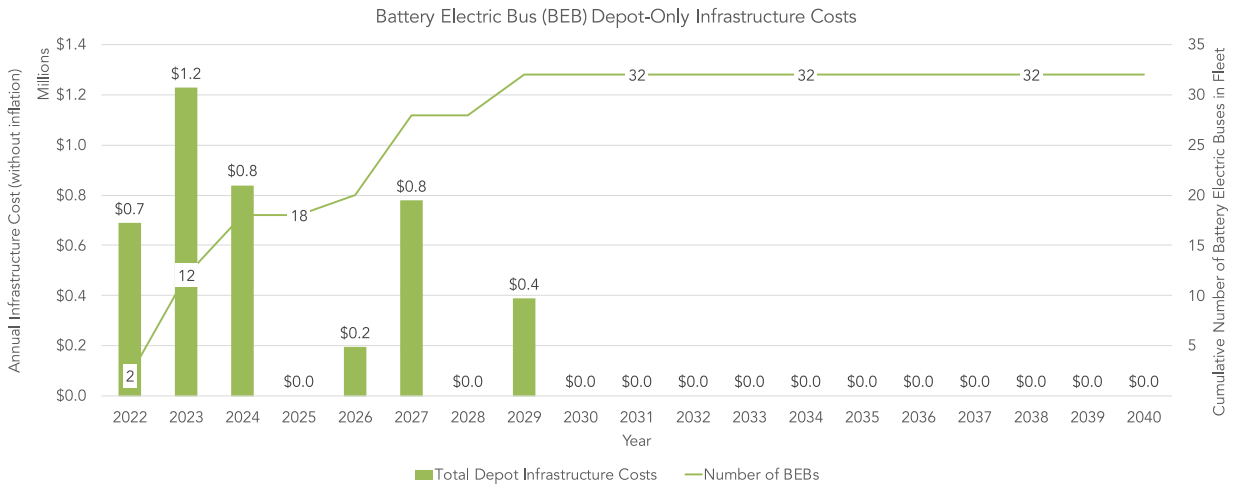

Figure 4: *Depot Only Annual Costs, Infrastructure*

The total number of each infrastructure type included in this cost analysis is included in **Table 3**.

Table 3: *Infrastructure Summary*

Infrastructure Element	Total Quantity Required (2022 – <FINAL PROCURMENT YEAR>)
Planning and Design	*1*
Chargers	*16*
Dispensers	*32*
Added Service Capacity	*3000kW*

Element 5: Partnership Assessment

Battery Electric Bus Partnership

Establishing and maintaining a partnership with the local electric utility is critical to successfully deploying zero-emission vehicles and maintaining operations. With the addition of battery electric buses to a fleet, a transit agency may likely become a utility's largest customer with added implications for grid-side infrastructure and agency operational costs. Early coordination and discussions can avoid costly delays and misaligned operational strategies while also revealing opportunities for lower operational costs and smart investments. Fortunately, electric utilities are beginning to develop electric vehicle rates and streamlined processes for charging infrastructure interconnections that can support successful zero-emission fleet deployments.

Union City Transit is aware that taking advantage of these benefits and ensuring a successful battery electric bus deployment requires close, ongoing coordination with the electric utility provider, Pacific Gas and Electric (PG&E). Union City Transit's discussion of short- and long-term fleet goals with PG&E ensures that PG&E can properly plan grid-side electrical infrastructure upgrades and that Union City Transit can adequately upgrade behind-the-meter equipment to support battery electric buses. Once the infrastructure upgrade needs are established, Union City Transit will incorporate the design and construction timelines into the overall transition plan timeline.

Union City Transit recognizes PG&E as a critical partner in electrification and will continue to partner with PG&E after the planning stages, so that charge management strategies and fleet expansion efforts can be coordinated effectively. Union City Transit is already enrolled in PG&E's EV Fleet Ready program and is working with an engineer assigned to assist in the infrastructure needs to support a ZEV transition.

The City of Union City is a member of the Joint Powers Agency (JPA) that governs the not-for-profit public agency that provides Community Choice Energy service in Alameda County, known as East Bay Clean Energy (EBCE). Union City Transit is working with EBCE to provide Charging as a Service (CaaS) since they are assisting other municipalities in Alameda County transition their municipal fleets to zero-emissions through CaaS. The agreement for EBCE to provide CaaS to Union City includes design, engineering, and installation of the charging equipment along with operations and maintenance, reduced charging rates, ongoing fleet analysis, and necessary reporting. Union City Transit received their letter of commitment to offer CaaS to support Southern Alameda County's only public municipal transit operator and can be found in Attachment I.

Element 6: Workforce Analysis

Union City Transit, located in Union City, CA, operates a fleet of 32 buses, including two (2) current battery electric buses. The agency is a leader in transitioning to ZEBs and has committed to transitioning to 100% ZEBs by 2034. This includes purchases of unibody paratransit vans in 2021 and 2022, electric cutaway paratransit vans in 2022, adding eight (8) or more full-size electric buses in 2023, adding BEB Charging Infrastructure to the depot in 2023, and adding on-route charging infrastructure for the full-size electric buses at a future date. In order to support ZEB operations at this scale, Union City Transit has identified opportunities ensure the current and future workforce is prepared to manage its full fleet of more than 32 future ZEBs. This Workforce Development Plan focuses on ZEB operations and maintenance.

In alignment with FTA's requirements under the Workforce Development for the 2022 Low No program, Union City Transit will build a ZEB workforce program in consultation with labor representatives through its operations and maintenance contractor. Together, Union City Transit and the contactor will determine how to best reskill and upskill the current workforce to meet the needs of Union City Transit's future operational and maintenance needs.

Workforce Analysis Overview

Developing and training the workforce required to operate and maintain zero-emission buses requires significant investment and planning. Union City Transit's operations and maintenance contractor is experienced in recruiting, hiring, training, and integrating new staff to ensure that employees are qualified to provide quality services to our riders. The level of training that Union City Transit's contracted staff engage in upon hiring is dependent upon their level of experience at that time. Union City Transit recognizes that a trained ZEB workforce is not readily available and the transit industry must address the shortage of technicians and mechanics together. Union City Transit currently supports the contractor's organized machinists with ad hoc training of new City owned equipment through either the original equipment manufacturer (OEM), the qualified vehicle modifier (QVM) of the OEM, or both depending on how the QVM's equipment interacts with the OEM.

Union City Transit plans to develop and maintain a qualified ZEB staff by requiring the operations and maintenance contractor to hire qualified new staff and retrain existing staff who have previously worked with internal combustion engine (ICE) systems. Meaningful investment is required to upskill maintenance staff and bus operators that were originally trained in diesel vehicle maintenance and fossil fuel fueling infrastructure. Transitioning to zero-emission vehicles is a paradigm shift for all aspects of transit operations including but not limited to scheduling, maintenance, and yard operations. Union City Transit's workforce development activities will address the identified skills and tools needed for each relevant team.

Completed Trainings

Union City Transit received a Ford Transit T-350EL unibody van upfitted by QVM Lightning eMotors in 2021. Lightning eMotors, as part of the procurement of the vehicle, came to the maintenance shop to provide hands-on training regarding the diagnosis and maintenance of the propulsion system they installed, training on the battery and how to work on the vehicle whether energized or de-energized, and also when to contact Lightning eMotors if the system fails or becomes unserviceable. The Lightning eMotors system is on the underside of the vehicle, so technicians have been able to service the vehicles through the normal jack system to date. Union City plans to continue this type of training for QVM systems of other OEM products because each version tends to be slightly different.

As has been standard practice with all prior heavy-duty transit bus procurements, Union City Transit makes sure that the drivers, supervisors, managers, and maintenance teams all get appropriate in-class and hands-on training for the new equipment Union City Transit provides. Union City Transit typically waits until the vehicle is in production before asking what types of specialized equipment or tools it needs to invest in for the contractor's staff because each production typically comes with slight variations depending on how much time passes between them. Once the build is finalized for production, Union City Transit starts working with the contractor to obtain all the recommended or required equipment and tools to service the vehicle in advance of its arrival. This also prepares the facility and technicians to be ready for the OEM trainer when they arrive onsite.

Union City Transit requires the contractor to document all the trainings and certifications received by maintenance staff both at the maintenance facility and with the contractor's Safety and Training Manager. At this time, Union City Transit is still gaining expertise in the electrified vehicle space and will leverage the heavy-duty transit vehicle OEM to prepare the agency and staff for the delivery of their vehicles. In the meantime, Union City Transit's current contractor, MV Transit, has created a division dedicated to electrified fleet transitioning and will be relying on them to provide the necessary groundwork in advance of specific requirements for its employees.

Identified Training Needs

Several training needs have been identified by Union City Transit staff in order to support their transition to a 100% ZEB fleet. Union City Transit is committed to ensuring new training and technologies do not displace current workers and has placed a priority on training existing staff through partnerships with manufacturers of procured electrified vehicles. The identified training needs are anticipated to evolve as Union City Transit's fleet expands. As such, the following training plans are intended to provide a framework.

Many procurement contracts include train-the-trainer courses through which small numbers of agency and contracted staff are trained and subsequently train agency colleagues. This method

provides a cost-efficient opportunity to minimize the need for external training while maintaining institutional knowledge and providing widespread agency training on new equipment and technologies. Union City Transit currently relies on OEM training but has a desire to use a train-the-trainer program to maintain knowledge expertise in-house. Third party resources will continue to be used as needed.

Union City Transit plans to take advantage of trainings from the bus manufacturers and infrastructure suppliers, including maintenance and operations training, maintenance and safety, first responder training, and other trainings that may be offered by the providers. OEM trainings provide critical information on operations and maintenance aspects specific to the equipment model procured. Union City Transit training staff will work closely with the OEMs providing vehicles to ensure all mechanics, service employees, and bus operators complete necessary training prior to deploying ZEB technology. Union City Transit staff will also be able to bring up any issues or questions they may have about their training with their trainers. Additionally, trainers will observe classes periodically to determine if any staff would benefit from further training. Union City Transit expects staff to receive training from the following OEMs and service providers:

- GILLIG
- Lightning eMotors
- East Bay Clean Energy (EBCE)
- Pacific Gas & Electric (PG&E)
- Selected electric vehicle supply equipment (EVSE) provider(s)
- Selected tool and equipment providers
- Current contractor, MV Transit, or future contractor, to be determined

As more ZEBs are procured, Union City Transit aims to continue working with the above list of OEMs and partners to stay up-to-date on new tools and training needed for their workforce.

Union City Transit also plans to use National Training Institute (NTI) training courses specific to ZEBs. As the technology develops and ZEBs are procured, Union City Transit will periodically re-evaluate what courses are available and how they apply to their fleet plans, in order to leverage them for Workforce Development.

Resources and Strategies to Meet Identified Needs

In order to incorporate the above training needs, Union City Transit envisions using following resources and strategies. To achieve these goals and ensure a successful deployment of zero-emission buses, Union City Transit will require $590,125 in funding to cover the workforce development initiatives identified. FY2022 Low-No funding will ensure the workforce development plan can be implemented in parallel with deployment of vehicles and infrastructure. **Table 4** identifies the preliminary training resources Union City Transit is budgeting the workforce development portion of the FY2022 Low-No application toward.

Table 4: *Training Resources*

Training Resource/Strategy	FY2022 Low-No Budget
National Training Institute (NTI)	No Cost
Bus OEM Operator, Maintenance, & First Responder Training	$100,000
Infrastructure Training	$15,000
PPE, Tools, and Equipment	$225,125
Training Aids, Simulators, Components, and Equipment	$250,000

Workforce Development Timeline

Demand for skilled and experienced workers will increase rapidly as new clean transportation policies and programs take effect and as numerous agencies begin fleet transitions. Aligning workforce development activities with the fleet transition timeline ensures that a qualified workforce is ready and available to support a successful deployment. Based on Union City Transit's fleet transition plan of 100% ZEBs by 2029, the graphic below shows the anticipated progression. Union City Transit has one (1) electric paratransit vehicle already, procured two (2) more to arrive in 2023, expects to exceed 50% ZEBs among all vehicles by 2025, and expects to reach a 100% ZEB fleet with 2029 procurements. Operators and maintenance technicians are trained for the paratransit vehicle currently in the fleet. As new and different types on ZEBs are procured, including full-size transit ZEBs, Union City will continue providing resources and training to keep the workforce current. As a result, the effort to reach 100% ZEB Trained Mechanics is ongoing and is tied to procurement of new types of vehicles, not a specific year. **Figure 5** shows snapshots of Union City Transit's Fleet Composition and Workforce ZEB Readiness in 2022, 2025, and when full ZEB composition is reached in 2030.

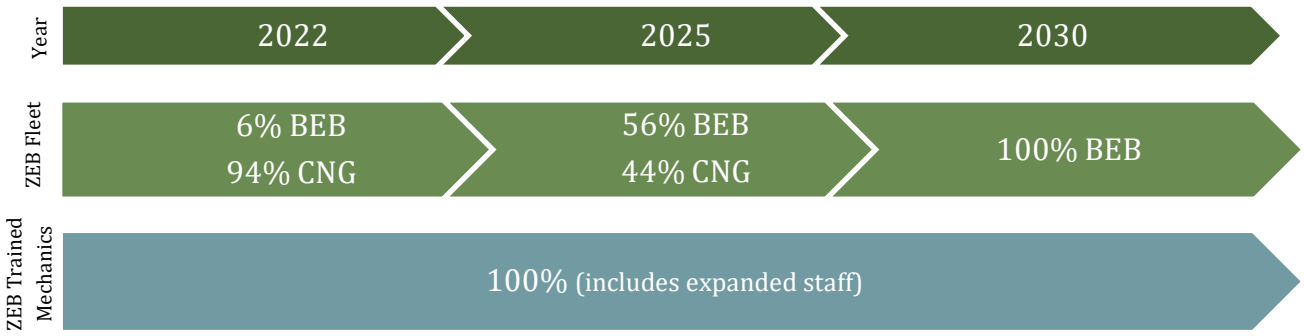

Figure 5: *ZEB Fleet & Mechanic Transition Plan*

Workforce development is an ongoing process that must continue as fleets scale up and deploy additional zero-emission vehicles. To ensure that the workforce scales efficiently and cost-effectively, Union City Transit will employ training strategies that support additional zero-emission vehicle deployments in the future. In addition to using NTI resources and OEM Training, Union City Transit anticipates specific training provided by infrastructure partners, new PPE, Tools and Equipment specific to working on high-voltage vehicles with unique components, and Training Aids, Components and Equipment to support a ZEB-ready workforce. As procurement of ZEBs moves forward, Union City Transit will continue re-evaluating the most cost-effective long-term methods and resources to meet the goal of a zero-emission bus fleet by 2030.