Board Members

County of Humboldt

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Zero Emission Bus Rollout Plan

Humboldt Transit Authority

Version 1.0

Adopted June 8th, 2023

Contents

Figures

Tables

Innovative Clean Transit Rollout Plan in Compliance with California Air Resources Board Requirements

This section provides information needed that meets CARB requirements for the Innovative Clean Transit (ICT) regulation per Title 13 California Code of Regulations §2023.

A: Transit Agency Information

Humboldt Transit Authority (HTA)
133 V Street, Eureka, CA 95501

HTA is part of the North Coast Unified Air Quality Management District within the North Coast Air Basin

Annual Maximum Service Peak Vehicles: 16
Combined Population of Total Area Served: 127,015

Contact Information:
Greg Pratt, General Manager
707-443-0826 x101
greg@hta.org

HTA is not part of a Joint Group as defined by 13 CCR § 2023.1(d)(3)

B: Rollout Plan General Information

Does HTA present a goal of full transition by 2040: Yes

As shown in Figure 2, the current plan does not require early retirement of conventional buses to achieve the 2040 target.

Follow up contact information

- Name: Greg Pratt
- Title: General Manager
- Phone: 707-443-0862 x101
- Email: greg@hta.org

This roll-out plan was developed in-house.

C: Technology Portfolio

The majority of HTA's revenue miles occur on intercity routes with high daily mileage and high average mph. Hydrogen is required for these routes. Electric vans and cutaways will be deployed in earlier years on routes where feasible. HTA plans to convert the entire fleet, all vehicle types, to hydrogen to maximize hydrogen fuel consumption thereby decreasing the overall cost per kg of hydrogen, and to maximize flexibility in deploying vehicles across different routes.

HTA anticipates transitioning electric vehicles over to hydrogen as these vehicle types become available with this fuel. HTA will require vehicle manufacturers and suppliers to provide proven commercially available, not prototype, fuel cell vehicles as detailed below (also highlighted red in Table 2):

- Fuel cell coach in 2028. This coach must reliably achieve a minimum of 400 mile range between fueling events at the fuel cell stack EUL.
- Fuel cell cutaway in 2031. This cutaway must reliably achieve a minimum of 350 miles between fueling events at the fuel cell stack EUL.

D: Current Bus Fleet Composition and Future Bus Purchases

Table 1 shows the current fleet composition. Table 2 shows the planned purchases out through 2040. Figure 1 and Figure 2 show by fuel type the fleet composition and planned purchases respectively.

Fleet replacement schedules shown assume HTA can strictly adhere to the Federal Transit Administration (FTA) useful life policy as defined in FTA Circular 5010.1D, Chapter IV, Section 3(f). However, adhering to this replacement policy is dependent on securing sufficient funding. Historically HTA has been able to secure funding to replace one (1) to four (4) buses per year. The replacement schedule shown here replaces an average of eight (8) buses per year between 2023 and 2040. It is not likely that HTA will be able to secure enough funding year-over-year to achieve this. However, this replacement schedule is needed to achieve the recommended goal of 100% fleet conversion by 2040, as stated in the ICT Regulation 13 CCR § 2023.1(d)(1). HTA plans to reflect the replacement schedule that is required to achieve this goal in this Rollout Plan, and report annually on progress.

Table 1: Individual Bus Information of Current Bus Fleet

Bus Type	Bus Model Year	Engine Model Year	Fuel Type	Count
Cutaway	2010	2010	Gasoline	1
Cutaway	2015	2014	Diesel	3
Cutaway	2015	2015	Diesel	1
Cutaway	2016	2014	Diesel	1
Cutaway	2017	2017	Gasoline	1
Cutaway	2018	2017	Diesel	1
Cutaway	2019	2017	Gasoline	2
Lowfloor	2009	2009	Diesel	5
Lowfloor	2011	2010	Diesel	2
Lowfloor	2012	2012	Diesel Hybrid	2
Lowfloor	2014	2013	Diesel Hybrid	2
Lowfloor	2014	2014	Diesel	7
Lowfloor	2015	2015	Diesel	4
Lowfloor	2017	2016	Diesel	1
Lowfloor	2018	2018	Electric	1
Lowfloor	2019	2019	Diesel	2
Lowfloor	2021	2021	Diesel	1
Lowfloor	2022	2022	Electric	2
Van	2015	2015	Gasoline	3
Van	2017	2017	Gasoline	1
Van	2019	2019	Gasoline	4
Total Count				**47**

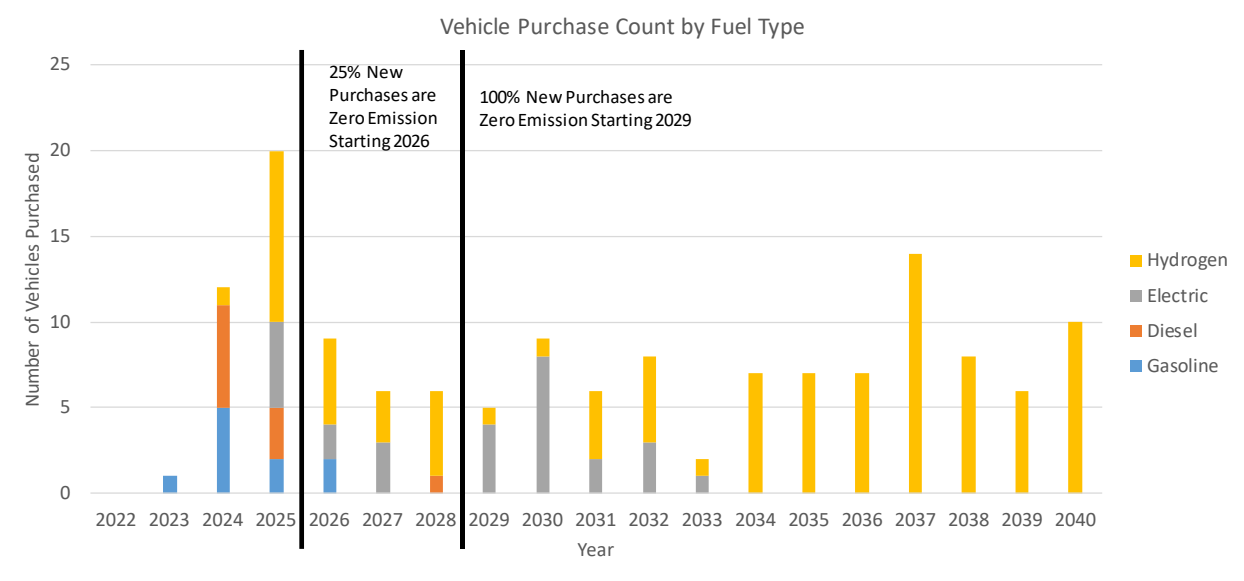

Figure 1: Vehicle purchase count by vehicle type.

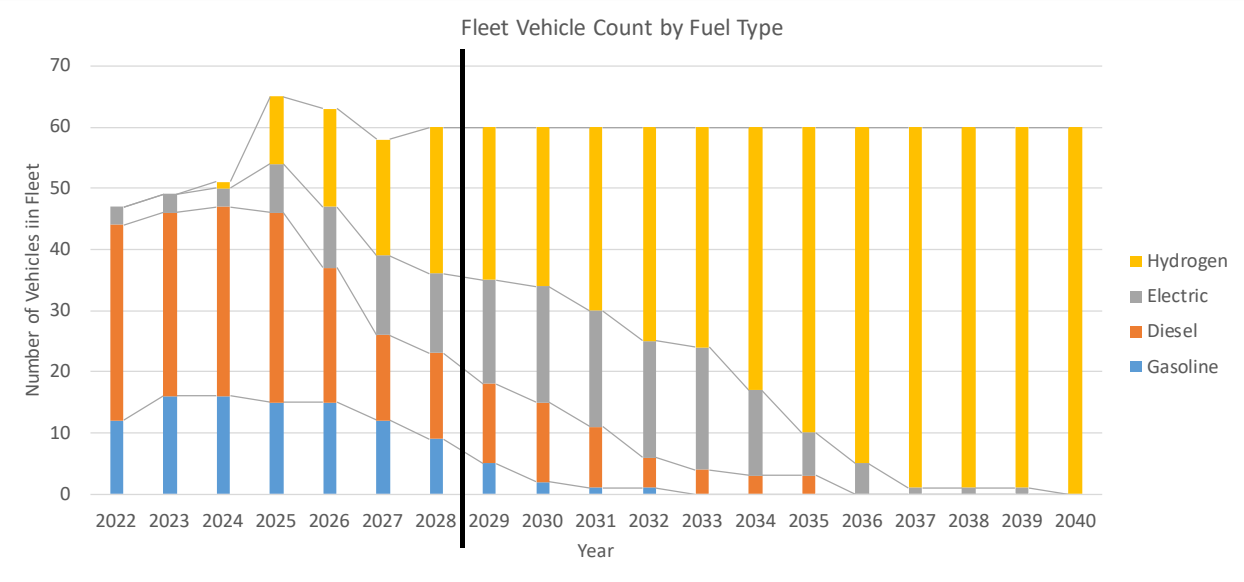

Figure 2: Total fleet vehicle count by fuel type.

Table 2: Future bus purchases. Italicized bus types are not currently commercially available for that fuel type.

Year	Total Number of Buses to Purchase	ZEB Purchases				Conventional Purchases			
		#	%	Bus Type	Fuel Type	#	%	Bus Type	Fuel Type
2023	1				Electric	1	100%	Cutaway	Gasoline
					Hydrogen			Lowfloor	Diesel
2024	12				Electric	5	42%	Van, Cutaway	Gasoline
		1	8%	Lowfloor	Hydrogen	6	50%	Cutaway, Lowfloor	Diesel
2025	20	5	25%	Van	Electric	2	10%	Van	Gasoline
		10	50%	Lowfloor	Hydrogen	3	15%	Cutaway	Diesel
2026	9	2	22%	Van	Electric	2	22%	Cutaway	Gasoline
		5	56%	Lowfloor	Hydrogen				Diesel
2027	6	3	50%	Van	Electric				Gasoline
		3	50%	Lowfloor	Hydrogen				Diesel
2028	6				Electric				Gasoline
		5	83%	***Coach***	Hydrogen	1	17%	Cutaway	Diesel
2029	5	4	80%	Van	Electric				Gasoline
		1	20%	Lowfloor	Hydrogen				Diesel
2030	9	8	89%	Cutaway, Van	Electric				Gasoline
		1	11%	Lowfloor	Hydrogen				Diesel
2031	6	2	33%	Van	Electric				Gasoline
		4	67%	***Cutaway***	Hydrogen				Diesel
2032	8	3	38%	Van	Electric				Gasoline
		5	63%	***Cutaway***, Lowfloor	Hydrogen				Diesel
2033	2	1	50%	Cutaway	Electric				Gasoline
		1	50%	Lowfloor	Hydrogen				Diesel

Year	Total Number of Buses to Purchase	ZEB Purchases				Conventional Purchases			
		#	%	Bus Type	Fuel Type	#	%	Bus Type	Fuel Type
2034	7				Electric				Gasoline
		7	100%	***Cutaway***, Lowfloor, ***Van***	Hydrogen				Diesel
2035	7				Electric				Gasoline
		7	100%	***Van***, Lowfloor	Hydrogen				Diesel
2036	7				Electric				Gasoline
		7	100%	***Cutaway***, Lowfloor, ***Van***	Hydrogen				Diesel
2037	14				Electric				Gasoline
		14	100%	***Cutaway***, Lowfloor, ***Van***	Hydrogen				Diesel
2038	8				Electric				Gasoline
		8	100%	***Cutaway***, Lowfloor	Hydrogen				Diesel
2039	6				Electric				Gasoline
		6	100%	***Cutaway***, Lowfloor	Hydrogen				Diesel
2040	10				Electric				Gasoline
		10	100%	***Cutaway***, ***Van***, ***Coach***	Hydrogen				Diesel

HTA is considering converting some of the conventional cutaway buses and vans to electric as a means of addressing the on-going shortage of cutaway chassis. However, no conversions are planned at this time.

Table 3: Schedule of Converting Conventional Buses to Zero-Emission Buses

Timeline (Year)	Number of Buses	Bus Type(s)	Removed Propulsion System	New Propulsion System
N/A	N/A	N/A	N/A	N/A

E: Facilities and Infrastructure Modifications

Facilities that require modification to support the transition to zero-emission fleets are shown in Table 4.

Table 4: Facilities Information and Construction Timeline

Division/ Facility Name	**Address**	**Main Function(s)**	**Type(s) of Infrastructure**	**Service Capacity (bus number)**	**Needs Upgrade? (Yes/No)**	**Estimated Construction Timeline**
Admin and Maintenance Facility	133 V Street, Eureka, CA 95501	Administration, operations, maintenance, fueling	Full redesign to improve efficiency of operations, accommodate new fueling infrastructure. Hydrogen fueling station, charging stations, maintenance bay upgrades.	Current: 45 – 50 Target: 60 - 70	Yes	Charging infrastructure has been completed for the current electric fleet. Hydrogen fueling and infrastructure supporting FCEBs will be completed by October 2024 in time for the first FCEB delivery. Additional charging infrastructure needs unknown at this time. Full yard redesign planned for completion FY27-28

HTA does expect to make modifications to bus parking arrangements due to limited available space, space occupied by and planned location of fueling infrastructure, and expected growth in routes, services offered, and integration of over-the-road coaches.

HTA does not expect to need additional parking spaces solely due to the transition to a zero emission fleet as the rollout plan targets a 1:1 replacement ratio. During the early transition phase there will be ~10% more vehicles than the long term plan. HTA anticipates that operations will be able to manage this temporary fleet size.

HTA's single facility is in Humboldt County, a NOx-exempt area, and is within PG&E's service territory.

Table 5: NOx-Exempt Area and Electric Utilities' Territories

Division's Name	Type(s) of Bus Propulsion System	Located in NOx-Exempt Area?	Utility Territory
HTA	All	Yes	PG&E

F: Providing Service in Disadvantaged Communities

HTA provides services to disadvantaged communities, low income communities, and communities with high burden scores across numerous metrics on pollution, health, housing, income, transportation insecurity, workforce development, and others as described by the following tools and shown in:

- Low Income Community per CalEnviroScreen (CES) 4.0 Priority Populations Tool[1]
- Disadvantaged Community per the Climate and Economic Justice Screening Tool (CEJST) 1.0[2]
- Transportation Disadvantaged per Department of Transportation's Disadvantaged Census Tracts[3]

These areas are shown in Figure 3. HTA's Administration and Maintenance Facility is in census tract 6023000500, and HTA's planned Intermodal Transit Center will be in census tract 6023000100. Both census tracts are identified as a

As all routes across all systems serve census tracts identified as disadvantaged by two federal mapping tools and identified by California as having high Population Characteristics burdens, HTA does not plan to prioritize deployment of ZEBs on specific systems or routes.

Table 6: Service in Disadvantaged Communities

Timeline (Year)	Number of ZEBs	Location of Disadvantaged Community
NA	NA	NA

[1] https://webmaps.arb.ca.gov/PriorityPopulations/
[2] https://screeningtool.geoplatform.gov/
[3] https://usdot.maps.arcgis.com/apps/dashboards/d6f90dfcc8b44525b04c7ce748a3674a

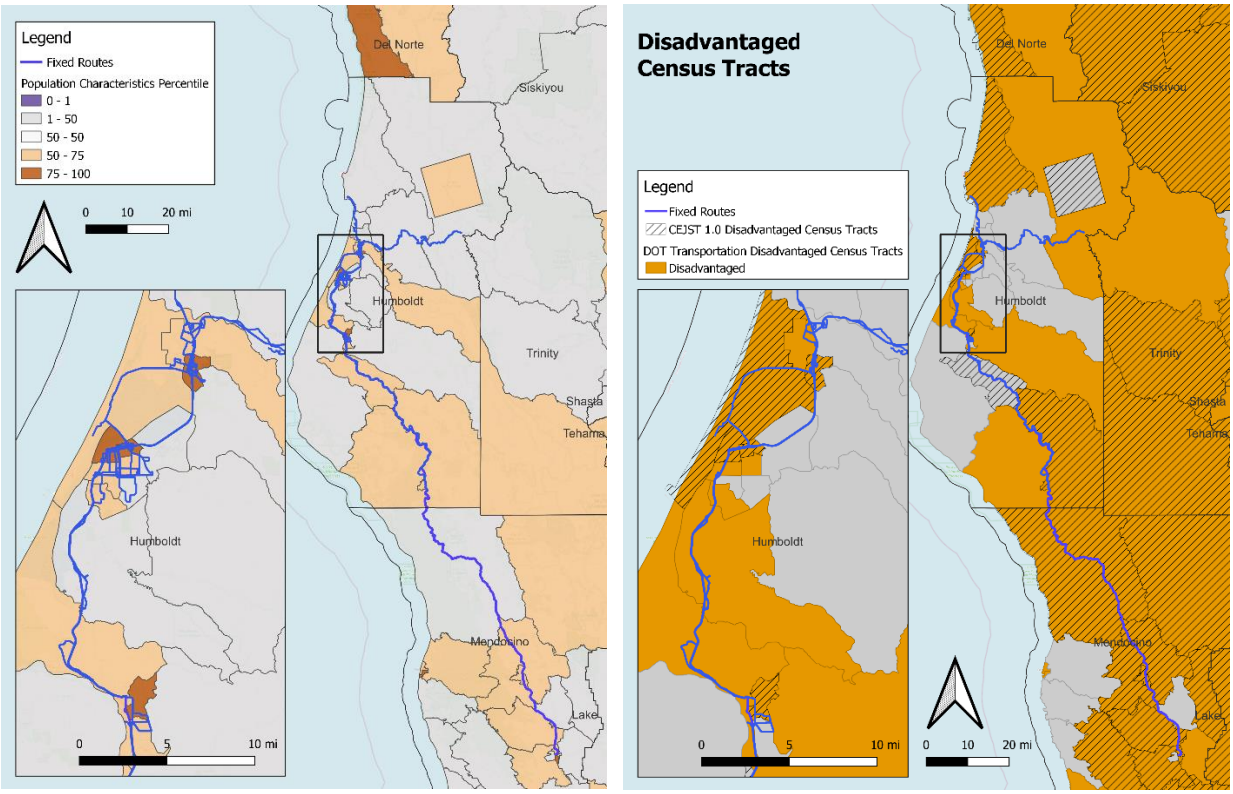

Figure 3: Census tracts served by HTA, including the population characteristics percentile scores per CES 4.0 shown on the left, and census tracts identified as disadvantaged per CEJST 1.0, and DOT's Transportation Disadvantaged Census Tracts Tool.

G: Workforce Training

HTA will leverage manufacturer training services during procurement, and training center services for train-the-trainer and refresher courses. Table 7 shows a high level summary of the planned training schedule. HTA will offer and extend training opportunities and events to key stakeholders such as first responders and towing companies. In addition, HTA is partnering with local and regional workforce development programs to explore opportunities for supporting the regional transition to zero emission vehicles. See the *Zero-Emission Fleet Transit Plan in Compliance with Federal Transit Administration Requirements - Develop a Workforce* Transition Plan section for more details.

Table 7: Proposed training schedule. HTA staff are shown in blue and will be required. Stakeholders are shown in green and will be offered on a voluntary basis.

Event	Maintenance / Technician	Operator	Other HTA Staff	First Responders / Towing	Local Workforce Development Program
New Hire	All trainings required by position	Fundamentals	Fundamentals	Fundamentals	Fundamentals
Vehicle Purchase	All OEM Trainings	As recommended by OEM	N/A	As recommended by OEM	As recommended by OEM
Train-the-Trainer	Minimum three years for fundamentals and compressed gas tank testing, as recommended for all other trainings	Minimum three years on fundamentals	Minimum three years on fundamentals	Minimum three years on fundamentals	Minimum three years on fundamentals
Scheduled Refresher	Minimum three years on fundamentals, as recommended on all other trainings	Minimum three years on fundamentals	Minimum three years on fundamentals	Minimum three years on fundamentals	Minimum three years on fundamentals

H: Potential Funding Sources

HTA will be monitoring multiple funding sources to support this transition. See *Zero-Emission Fleet Transit Plan in Compliance with Federal Transit Administration Requirements - Address the Availability of Current and Future Resources to Meet Costs for the Transition and Implementation* below for more details.

I: Start-Up and Scale-Up Challenges

There are numerous key challenges associated with transitioning to battery electric and fuel cell electric technologies that HTA has not yet fully solved. These are discussed in the following sections.

Managing Fuel Cost

Fuel cost is a key concern for both battery electric and fuel cell electric technologies. Battery electric buses require charging management solutions to effectively navigate the complex time-of-use pricing structure of electricity rates. HTA currently has little experience with fully electrifying a route or system, so has yet to aggregate data to understand the true costs. Initial modeling was done for the current fleet of three battery electric buses. The results of this modeling are shown in Table 8 at an estimated $0.54 per mile. This is for a “manual” charging management scenario where maintenance staff are instructed

to plug in and unplug buses at particular times to avoid peak time-of-use periods. For comparison, AC Transit has reported a cost of $0.46 per mile.[4]

However, the "manual" approach is not sustainable for scaling up the size of battery electric bus fleet. HTA is currently planning to have a peak BEB count of 20 before phasing out BEBs. HTA is unclear what additional capital and operating costs are needed to enable effective electricity demand and energy cost management, such as battery energy storage to avoid peak charges. Additional software may also be needed to enable schedule charging which also has subscription costs associated with it. These costs are unknown.

Table 8: Estimated fuel cost for battery electric buses.

3-Bus Scenario	Efficiency (mi/kWh)	Daily Mileage	Daily Electricity Cost	Effective $/kWh	Daily EVSE Software Cost	Total Cost ($/mi)
"Manual" Charging Management	0.44	518	Demand: $9.86 Energy: $247.95	0.219	$21.25	$0.54

The cost of hydrogen is challenging for different reasons. The hydrogen supply chain for the transportation sector is still nascent. The cost of fuel is currently very high compared to gasoline, diesel, and electricity. In addition, HTA operates in a remote and rural part of California which drives up the cost of delivery significantly. HTA has been exploring different hydrogen supply options and has compiled official and unofficial quotes from a variety of different pathways as shown in Figure 4. Assuming a cost range of $7 - $11 per kg into the bus, and assuming an efficiency range of 5.5 – 8 miles per kg[5], total cost per mile of fuel could range anywhere from $0.87 to $2 per mile. For comparison, AC Transit has reported a fuel cost of $1.19 per mile[4]. Despite this intractable increase in operating cost, HTA is confident that fuel cell electric buses are necessary to meet current duty cycles and allow interlining of buses across routes. HTA is committed to working with the State to advance the industry and reduce the cost of fuel.

[4] See AC Transit's report Zero Emission Transit Bus Technology Analysis, Volume 4.

[5] Efficiencies obtained from both on-road testing and OEM modeling of HTA's Redwood Transit System route and planned new intercity Redwood Coast Express route.

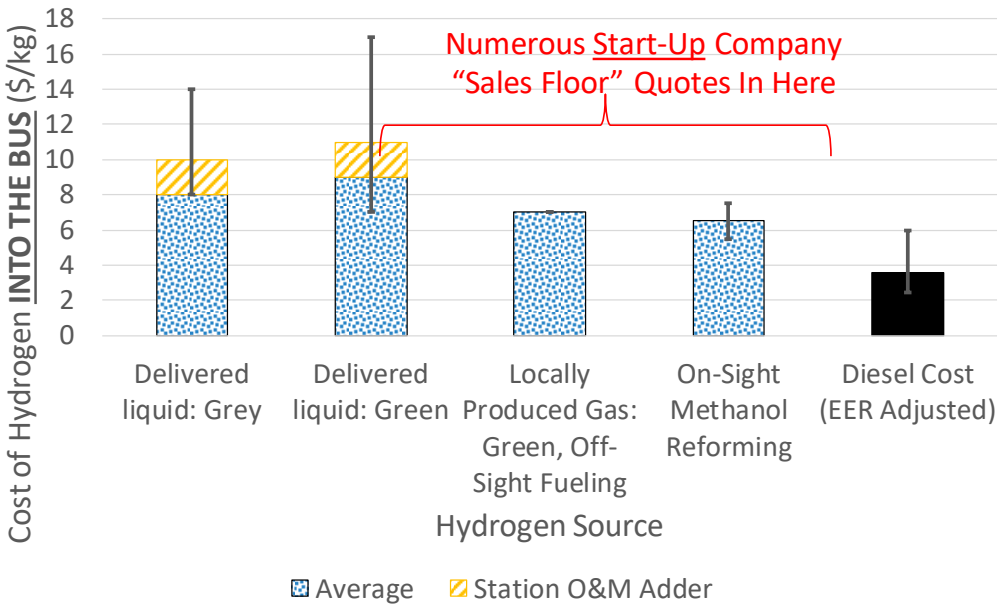

Figure 4: Assessment of cost of hydrogen into the bus quotes from a variety of sources.

Managing Fuel Supply Resiliency

Humboldt County is a remote rural County. Resiliency of electrical infrastructure in Humboldt County as a whole is comparable to the rest of the state[6] with an average interruption duration of 154 minutes, and a five year maximum duration of 230 minutes[7]. An assessment of the impact of major events shows an average outage duration of 965 minutes (16 hours), and a max outage length between 2019 and 2021 of 2,319 minutes (38 hours). However, the Humboldt Bay area, where HTA is located, is "islandable" from the rest of the transmission and distribution system in the County and can be powered by PG&E's Humboldt Bay Generation Station. This reduces the impact of outages on HTA's operations significantly.

HTA anticipates only converting cutaway fleets that serve routes around Humboldt Bay to battery electric buses. Therefore, the significant challenges faced by more remote areas of Humboldt County are not anticipated to impact HTA's operations. However, HTA does expect to design and install on-site solar generation, battery energy storage, and microgrid infrastructure to mitigate the impact of outages due to major events.

Hydrogen fuel supply resiliency is also of concern. Reliability of delivery of fuel can be impacted by road closures which are common along the two state highways 299 and 101 providing access to the County, particularly during winter. HTA also does not have the space to produce enough electricity on-site to meet the load of on-site electrolytic hydrogen. Therefore, the station design and fuel source must be considered together as some solutions would not likely provide the resiliency needed to sustain HTA through highway closures or major events. There are several options being explored, such as:

[6] This ignores the fact that there are six circuits in Humboldt County that are listed on PG&E's list of Top 1% Worst Performing Circuits. HTA's operations will not be impacted by these circuits with this transition plan.
[7] See PG&E annual reliability reports at https://www.pge.com/en_US/residential/outages/planning-and-preparedness/safety-and-preparedness/grid-reliability/electric-reliability-reports/electric-reliability-reports.page

- Liquid Delivery and Storage: this provides a proven station design and supply chain with the ability to store up to a week or more of fuel. In addition, the onsite electrical load of a liquid storage station is comparably low at around 200kW peak and 100kW running. This load is easily managed with onsite back generation.
- Local Off-Site Generation and Gas Storage: this option could address the road closure challenges depending on the location of production. Deliveries may need to be more frequent as they are likely gas. Would require a company dedicated to operating and managing a production site in a remote location.
- On-Site Generation: HTA does not have the space for on-site electrolytic hydrogen. In addition, HTA does not have sufficient space to meet the electrical load of electrolytic hydrogen with on-site power generation. However, HTA may have the space for on-site reformation of methanol. However, on-site methanol reformation is also subject to road closures impacting delivery of methanol.
- Off-site fueling: HTA may consider an off-site fueling option should another fuel provider develop a card lock option. HTA does not anticipate the private sector offering this within at least the next 10 years, such that it is likely not a near-term solution.

Planning for Growth

HTA is collaborating with local agencies and jurisdictions to tackle aggressive climate action and community development targets. The Humboldt County Regional Transportation Plan[8] has numerous safe and sustainable transportation targets, many of which will require HTA to grow significantly. These include:

- Increase the percentage of all trips, combined, made by walking, biking, micro-mobility/matched rides, and transit to at least 30% by 2030 and 40% by 2050.
- Double transit trips (including mobility on demand trips) by 2025, and again by 2030, and again by 2040.
- Reduce VMT per capita by at least 25% by 2030, and 40% by 2050. (VMT includes zero-emission trips).
- Starting by 2022, 80% of all new permitted housing units are in places with safe, comfortable, and convenient access to employment, shopping, and recreation by walking, biking, rolling, or transit.
- By 2035, 60% of the county's population—equitably distributed regionwide—live where they can safely, comfortably, and conveniently travel to everyday destinations by walking, biking, rolling, or transit/micro-transit.
- Maintain zero traffic fatalities per year.

The current planned growth in fleet size presented in this Rollout Plan anticipates only a fraction of the necessary growth to meet these targets. HTA anticipates growing to a fleet size of 60 by 2026, with additional growth requirements unknown at this time. To accommodate this growth, as well as address challenges with aging infrastructure and inefficiencies with how infrastructure is currently laid out, HTA is planning to completely redesign and replace the existing facility at 133 V St., Eureka. This facility is anticipated to enable the fueling infrastructure needed to meet the peak battery electric bus fleet size

[8] https://www.hcaog.net/library?term_node_tid_depth=6

of 20, fully support a mixed fuel fleet of gasoline, diesel, electric, and hydrogen during the transition to hydrogen, and fully support an all-hydrogen fleet size of 60 out through 2040. Without this redesign and replacement, supporting this transition would be extremely challenging. HTA is applying for funding now with the goal of completing construction before 2030.

The capacity of the electrical distribution system serving HTA's facility must be considered. The current distribution system is expected to have sufficient capacity to meet the current Rollout Plan. However, as HTA solidifies requirements for meeting regional growth targets, HTA will continue engaging with PG&E to better assess capacity and to communicate results of this Rollout Plan.

Workforce Needs

HTA currently has challenges with meeting hiring and training requirements for existing operations. Trades industries have been challenged with recruiting younger workers for decades. The transition to a zero emission fleet strains these issues further.

HTA is collaborating closely with workforce development organizations such as the Humboldt County Workforce Development Board (HCWDB), and the Humboldt Workforce Coalition (HWC), which acts as supportive to the HCWDB by developing pipelines to employment through a strategic partnership between the County of Humboldt, College of the Redwoods (CR), Cal Poly Humboldt (CPH) and Humboldt County Office of Education (HCOE), to address the broader workforce development challenges in the region, and to collaborate and support each other's efforts to meet the needs of all trades industries, including public transit.

See the *G: Workforce Training* section above, and the *Zero-Emission Fleet Transit Plan in Compliance with Federal Transit Administration Requirements - Develop a Workforce Transition Plan* section for more details

J: Board Resolution

The HTA Board adopted Resolution 23-09 which approves this plan on June 8th, 2023. This Resolution is included in the following pages.

RESOLUTION NO. 23-09,

APPROVING THE ZERO-EMISSION BUS ROLLOUT PLAN FOR THE HUMBOLDT TRANSIT AUTHORITY

WHEREAS, the Humboldt Transit Authority directly operates, oversees safe, friendly, and reliable public transportation in the County of Humboldt; and

WHEREAS, California Code of Regulations Title 13, Division 3, Chapter 1, Article 4.3, Part 2023.1(d) Zero Emissions Bus Rollout Plan Requirements requires that a transit agency Zero-Emission Bus Rollout Plan must be approved by its governing Board and submitted to the California Air Resources Board no later than July 1st, 2023; and

WHEREAS, HTA procured it's first zero emission bus October, 2018 to kickstart the process of assessing and understanding zero emission technologies; and

WHEREAS, in December 2nd, 2020 the HTA Board received a presentation on the results of a Comparative Analysis of Electric and Hydrogen Transit Fleets; and

WHEREAS, on May 5th, 2021 the HTA Board authorized staff to apply for grants that will provide funding for zero emission infrastructure and buses; and

WHEREAS the Humboldt County Association of Governments 2022-2042 Regional Transportation Plan identifies the following Regional Targets:

- 100% of public buses and school buses are zero emission by 2030;
- Each governmental agency starts converting fleet vehicles to zero-emission by 2022, with interim targets to meet the State's 2035 goals:
    - 25% of public fleet passenger cars, SUVs, and forklifts are zero-emission by 2025, and 50% by 2030.
    - 30% of public fleet medium-duty and pick-up trucks are zero-emission by 2030.
- 100% of public fleet work vehicles are zero emission by 2036.
- In Humboldt County, by 2024 hydrogen fuel is available for public transit and long-haul commercial fleet vehicles, with green hydrogen fuel available as much and as soon as possible;
- In Humboldt County, by 2030 there is sufficient hydrogen fueling infrastructure and green hydrogen fuel available to enable inter-county travel of medium and heavy-duty fuel-cell EVs; and

WHEREAS, Zero-Emission Bus Rollout Plan sets forth the Humboldt Transit Authority's plan which meets the following requirements:

- A goal of full transition to zero-emission buses by 2040 with careful planning that avoids early retirement of conventional internal combustion engine buses;
- Identification of the types of zero-emission bus technologies Humboldt Transit Authority is planning to deploy;
- A schedule for zero-emission and conventional internal combustion engine bus purchases and lease options;

- A schedule for conversion of conventional internal combustion engine buses to zero-emission technologies;
- A schedule for construction of facilities and infrastructure modifications or upgrades, including charging, fueling, and maintenance facilities, to deploy and maintain zero-emission buses;
- Explanation of how Humboldt Transit Authority plans to deploy zero-emission buses in Disadvantaged Communities;
- A training plan and schedule for zero-emission bus operators and maintenance and repair staff; and
- Identification of potential funding sources.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Humboldt Transit Authority hereby approves the Humboldt Transit Authority's Zero-Emission Bus Rollout Plan as set forth in full.

BE IT FURTHER RESOLVED that insofar as the provisions of any Ordinance, Resolution, document, or previous action of the Board and/or the General Manager, prior to the date of this Resolution, are inconsistent with the provisions of this Resolution or any policy adopted by this Resolution, this Resolution and the Board Policies adopted herein shall control.

PASSED, APPROVED AND ADOPTED this 7th day of June 2023 by the following roll call vote:
AYES:
NOES:
ABSENT:
ABSTAIN:

Alex Stillman Chair Pro-tem

Name: ~~Natalie Arroyo~~ Title: ~~Chair~~ of the HTA Governing Board of Directors

Signature: Alexandra Stillman Date: 6-8-23

Attest: Stillman, Ladwig, Trent, Woodall, Castellano

Secretary to the Board

Zero-Emission Fleet Transit Plan in Compliance with Federal Transit Administration Requirements

This section provides information needed to meet the FTA requirements for a Zero Emission Transition Plan as required by the statutory provisions of the Grants for Buses and Bus Facilities Competitive Program (49 U.S.C. § 5339(b)) and the Low or No Emission Vehicle Program (49 U.S.C. § 5339(c)).

Demonstrate a Long-Term Fleet Management Plan with a Strategy for How the Applicant Intends to Use the Current Application and Future Acquisitions

HTA anticipates a 1:1 replacement of existing vehicles over the long term by adopting a 100% fuel cell electric fleet by 2040. Battery electric vans and cutaways will be used during this transition until the market provides commercially proven fuel cell options for these vehicle classes. In addition, HTA anticipates growing the fleet size from 47 to 60 by 2030 and has planned for how this growth will be achieved with zero emission vehicles. See section *D: Current Bus Fleet Composition and Future Bus Purchases* and *E: Facilities and Infrastructure Modifications* above for additional details.

HTA's application to FY23 5339(b) and 5339(c) Programs is necessary to fully implement this Rollout Plan. HTA's Administrative and Maintenance Facility (Facility) is located at 133 V St., Eureka, CA 95501. As described in section *I: Start-Up and Scale-Up Challenges - Planning for Growth*, the existing location is expected to meet the needs of this Rollout Plan IF funding is secured to implement the required design changes needed. Additional substantial growth in public transit services needed to meet regional climate action and community development targets are unknown at this time.

Address the Availability of Current and Future Resources to Meet Costs for the Transition and Implementation

The following sections address capital and operating cost sources and needs.

Capital Costs

HTA anticipates there being sufficient capital funding sources to achieve the transition in this plan, although the timing of deploying necessary infrastructure is extremely uncertain given the competitive nature of most major funding sources.

Funding sources for capital costs of vehicles and supporting infrastructure are listed in Table 9.

Table 9: Funding sources for capital costs.

Agency Level	Source
Federal	FTA Enhanced Mobility of Seniors and Individuals with Disabilities (5310)
	FTA Rural Transit & Intercity Bus Program (5311 & 5311(f))
	FTA Buses and Bus Facilities Program (5339(b))
	FTA Low and No Emissions Program (5339(c))
	EPA Diesel Emissions Reduction Act
State	Low Carbon Transit Operations Program (LCTOP)
	Affordable Housing & Sustainable Communities (AHSC)
	Hybrid and Zero Emission Truck and Bus Voucher Incentive Project (HVIP)
	Volkswagen Environmental Mitigation Trust for California
	Transit and Intercity Rail Capital Program (TIRCP)
	State Transportation Improvement Program (STIP)
	State Transit Assistance (STA)
	SB1 State of Good Repair (SGR)
Regional	Local Transportation Fund (LTF)
	Carl Moyer Program (NCUAQMD)

Operating Costs

HTA has significant concerns regarding the expected increase in operating costs associated with the use of fuel cell technology. While the maintenance costs of buses are expected to be comparable or less to that of diesel technology, the cost of fuel may be 3x to 4x higher than the cost of diesel, particularly during early years of implementation. See section *I: Start-Up and Scale-Up Challenges* for details.

Funding sources for operating costs are listed in Table 10. HTA anticipates continuing to work with County stakeholders to explore options for additional local tax measures to provide additional operating funding needed to meet growth requirements.

Table 10: Funding sources for operating costs.

Agency Level	Source
Federal	FTA Enhanced Mobility of Seniors and Individuals with Disabilities (5310)
State	Low Carbon Transit Operations Program (LCTOP)
	Affordable Housing & Sustainable Communities (AHSC)
	Low Carbon Fuel Standard (LCFS)
	State Transit Assistance (STA)
	SB1 State of Good Repair (SGR)
Regional	Local Transportation Fund (LTF)
	Farebox

Consider Policy and Legislation Impacting Relevant Technologies

HTA is mandated under California's Innovative Clean Transit (ICT) regulation per Title 13 California Code of Regulations §2023 to transition to a zero emission fleet. This regulation imposes the requirement that

25% of all new bus purchases be zero emission by 2026, and 100% of all new bus purchases be zero emission by 2029.

The Bipartisan Infrastructure Law (BIL) funded the Department of Energy's Office of Clean Energy Demonstrations Regional Clean Hydrogen Hubs[9] program which will be critical for addressing the cost of hydrogen fuel. HTA has been tracking this effort, and while HTA is not directly included as a consumer of hydrogen that may be funded under this program, HTA expects to benefit from the reductions in fuel costs this program intends to catalyze. HTA is heavily relying on this program to realize the transition to 100% fuel cell fleet by 2040.

Other policies and legislation that impact transit, both directly and indirectly such as through housing and land use, will be tracked by HTA. For example, State Assembly Member Jim Wood has proposed AB 50 in March 2023 which would address many challenges associated with timely electrical interconnection of new projects which impacts the ability of HTA to deploy battery electric vehicles.

Include an Evaluation of Existing and Future Facilities and Their Relationship to the Technology Transition

HTA has one Administrative and Maintenance Facility (Facility). This Facility includes infrastructure that dates back to the 1970's. HTA purchased three of the currently owned 10 parcels sometime in the 1980's from a tree trimming service, which included much of the infrastructure that HTA currently uses. The administrative building and maintenance bays are a mix of 20 year old and 50 year old construction, with the 20 year old infrastructure added on in 1999-2000. The bus detail bay is at least forty years old, and the house on the north side that is currently office space was likely constructed before 1960. The fueling island was installed in 2006.

HTA's Facility is significantly behind in current code standards, many of which present safety hazards. For example, there is no fire suppression system in any of the administrative areas, and electrical infrastructure has been added on to the original 1950's equipment such that there is currently no complete planset or understanding of the full electrical infrastructure. Furthermore, as HTA's operations have continued to grow, the age and layout of existing infrastructure is increasingly interfering with efficiency of operations. When HTA first occupied the current Facility, it operated two transit systems with 15 buses. HTA now operates and maintains six different transit and on-demand systems with a fleet of 47 buses. HTA is also tasked with implementing a new Regional Transportation Plan target of growing ridership 8x by 2040 (see Table Renew-3 in the 2022-2042 Humboldt Regional Transportation Plan). It is unknown at this time whether HTA will acquire additional property in the future to meet growth requirements.

HTA is looking towards Federal and State funding to develop a complete redesign and State-of-Good-Repair replacement of the existing Facility. HTA has submitted applications to the Federal Buses and Bus Facilities (5339(b)), Low or No Emissions Program (5339(c)), and the California Transit and Intercity Rail Capital Program (TIRCP) to piece together funding for this new Facility. An early design concept is shown in Figure 5.

[9] https://www.energy.gov/oced/regional-clean-hydrogen-hubs

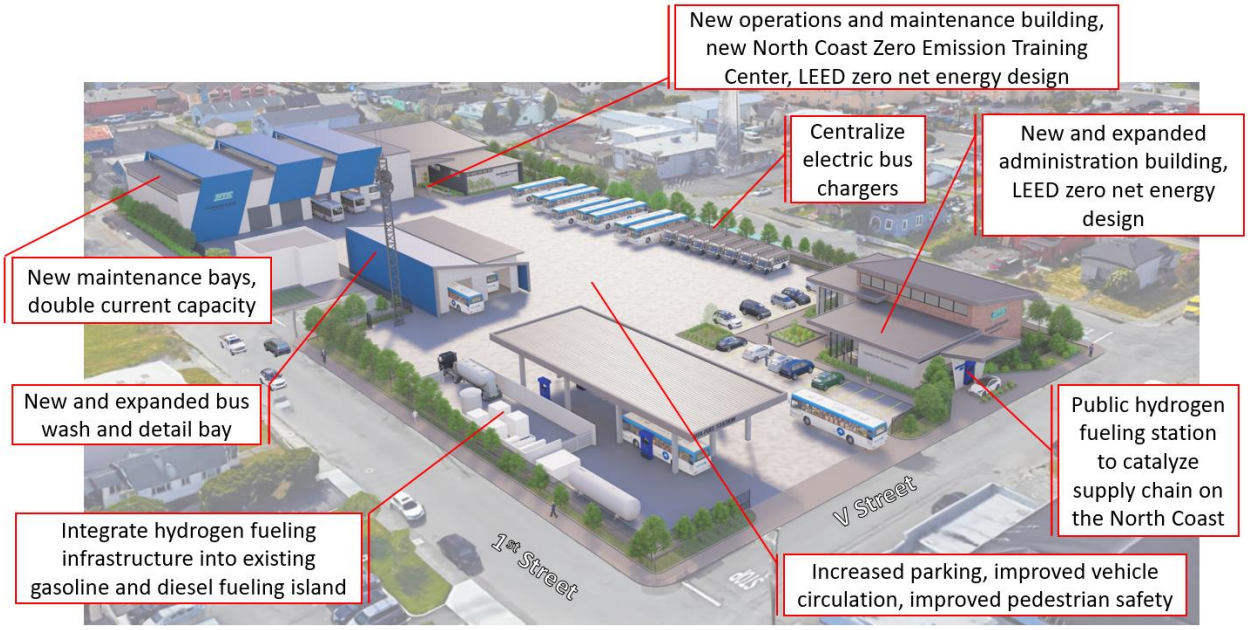

Figure 5: Early draft concept of a redesign and replacement of HTA's existing Administration and Maintenance Facility.

Describe the Partnership of the Applicant with the Utility or Alternative Fuel Provider

HTA will require partnerships with both Pacific Gas & Electric (PG&E), and a hydrogen fuel provider. HTA currently has worked with PG&E's EV Fleet Program to install service capacity for up to 150kW of charging infrastructure and has installed 120kW under this program. HTA will communicate the projected battery electric bus fleet requirements developed under this Rollout Plan and continue exploring solutions to possible existing capacity constraints for serving this projected fleet.

HTA has worked closely with hydrogen industry experts to develop detailed specifications for meeting projected hydrogen consumption requirements through 2030. HTA plans to issue a design/build Request for Proposals to procure a hydrogen fueling station in 2023. The funding for this station has already been secured under the California Transit and Intercity Rail Capital Program (TIRCP). HTA anticipates securing fuel supply contracts that provide the flexibility needed to take advantage of planned reductions in cost catalyzed by the Department of Energy's Office of Clean Energy Demonstrations Regional Clean Hydrogen Hubs Program.

Develop a Workforce Transition Plan

The transition to a zero emission fleet impacts mechanics, operators, and support staff. HTA currently provides all necessary training and will continue doing so to keep pace with changing technologies. This workforce transition plan describes the process for planning and scheduling training and the inter-agency cooperation with Original Equipment Manufacturers (OEMs). This transition impacts mechanics the most as the changes are most complex for mechanics. Therefore, HTA's training plan described below focuses primarily on mechanic training.

HTA is seeking state and federal funding to support the development of a North Coast Zero Emission Training Center. This Center will not only support training for transit employees, it will also support

regional community college curriculum and workforce development programs. It will leverage HTA's fleet and fueling infrastructure to provide hands on career training opportunities and support career pathways for the California North Coast.

HTA is committed to collaborating with local unions and workforce representatives to address the broad and fast paced shift to zero emission technologies in the automotive, fleet, and transit sectors. HTA is a proud employer of members of the American Federation of State, County and Municipal Employees (AFSCME) Local 1684. HTA has begun conversations with the Humboldt County Workforce Development Board (HCWDB), and the Humboldt Workforce Coalition (HWC), which provides support to the HCWDB by developing pipelines to employment through a strategic partnership between the County of Humboldt, College of the Redwoods (CR), Cal Poly Humboldt (CPH) and Humboldt County Office of Education (HCOE), to improve cross pollination and collaboration between stakeholders, training efforts and funding sources within the region. HTA is committed to exploring opportunities for integrating and supporting regional apprenticeship programs as applicable.

Historically, as a small rural transit agency, HTA has not funded large construction projects. However, HTA has plans over the next ten years to fund multiple large construction projects, two of which will be eligible as Mega Construction Projects. Furthermore, both Mega Construction Projects will be in census tracts identified as Disadvantaged in the Climate and Economic Justice Screening Tool (CEJST) 1.0[10] (see also Figure 3). Particularly, both census tracts have multiple workforce development metrics that are indicated as a burden to these communities as shown in Table 11. As such, HTA is pursuing additional opportunities for project labor and community workforce agreements to maximize benefits to our regional communities. HTA can lead by example and implement one of the first Community Workforce Agreement in the County.

Table 11: Summary of CEJST scores for census tracts where known Mega Construction Projects are planned. Highlighted scores indicate metrics that are classified as a burden to the community.

Planned Mega Projects Through 2030: Census Tract	CEJST Disadvantaged	CEJST Workforce Development Metrics				
		Linguistic Isolation	Low Median Income	Poverty	Unemployment	High School Education
HTA Facility: 06023000500	Yes	72%	**96%**	86%	**95%**	**14%**
Intermodal Transit Center: 06023000100	Yes	48%	**97%**	85%	**91%**	**10%**

Skills and Training Credentials

As a small rural transit agency HTA does not have access to a large labor pool with the necessary skills for maintaining a transit fleet. In the 1990's HTA was fortunate enough to be able to draw from the Diesel Lab program at the local College of the Redwoods. Before the College closed their Diesel Lab, HTA

[10] https://screeningtool.geoplatform.gov/

had three mechanics at one point that were from the Diesel and Heavy Duty Truck program. HTA also attended, along with other heavy duty dealers and mechanics in the area, extra training courses that were put on by the College as a one or two day training course (e.g., Airbrakes, AC, New Engine Model Familiarization etc.). HTA also collaborated with the program and brought new technology models to share with students in past years as manufactures changed to electronics, and computerized engines and transmissions.

With the closure of this program, and with the shrinking pool of tradespeople nationally, HTA's mechanic job pool shifted to applicants with the basics of at least three years' experience in the automotive or heavy duty truck field. Recently, the labor pool has been even more challenging with mechanics hired with none of the necessary skills or training. Given how remote HTA's location is, HTA has been required to fund travel out of the County for all training which typically involves overnight stays and/or overtime pay. Despite these challenges, HTA has been able to have high retention in mechanics such that this training model has been cost-sustainable. HTA has a very minimal turnover in the maintenance department, with longevity ranging from 6 to 22 years in the class of mechanics.

Fortunately, HTA's current mechanic hiring model combined with low mechanic turnover is best poised to tackle the transition to zero emission technologies. Because the transit industry is mandated to be an early market leader in zero emission technologies, it will be critical for HTA to maintain in-house training during early market years. However, with significant planned growth in services, as described in section *I: Start-Up and Scale-Up Challenges* above, this training model is not expected to be sustainable. HTA will need support from workforce development programs to sustain growth projections. HTA is poised to support and contribute to the development of local and regional programs to ensure a successful transition of the transit, automotive, and heavy duty on-road and off-road sectors.

Current Workforce and Skill Sets

All staff, including administrative staff, are expected to be impacted by this transition. The most significant impact will be on mechanics. The following presents planned changes to existing internal training programs to address this transition.

Staff and stakeholders will be classified into three levels based on level of exposure to high voltage components. These are:

- ZEV Level I: No Exposure
    - Administrative Staff
- ZEV Level II: Low Exposure
    - Vehicle Support Workers (VSW)
    - Maintenance Personnel
    - Supervision and Management Staff
    - Bus Operators / Operations Staff
    - First Responders and Towing
- ZEV Level III: Moderate to High Exposure
    - Select EV Mechanic Classifications
    - HVAC Technicians
    - Maintenance Management and Supervisors
    - OEM Component Technicians

The current workforce and projected future workforce is shown in Table 12, including their classification.

Table 12: Current and future projected HTA workforce.

Class	Current			2030		
	ZEV I	ZEV II	ZEV III	ZEV I	ZEV II	ZEV III
Bus Operators		HTA: 32 Contracted: 5			HTA: 42 Contracted: 10	
Maint.		Mech I: 3 VSW: 2.5	Director: 1 Supervisor: 1 Mech II: 3		Mech I: 4 VSW: 3	Director: 1 Supervisor: 2 Trainer: 1 Mech. II: 5
Operations		Manager: 1 Supervisor: 1 Trainer: 1 Safety/ADA: 1			Manager: 1 Supervisor: 2 Trainer: 2 Safety/ADA: 1	
Admin	GM: 1 HR / Fin: 4 Plan: 1 Front: 1			GM: 1 HR / Fin: 4 Plan: 2 Front: 1		
Total	**HTA: 53.5 Contracted: 5**			**HTA: 72 Contracted: 10**		

Current Gaps in Skill Sets

Critical gaps in skill sets of HTA's current workforce are:

- Training needed for high pressure gas systems and for hydrogen fuel.
- Maintenance of charging stations and hydrogen fueling stations.

HTA will work with OEMs and hydrogen station developers to identify and refine the specific skills that are needed to implement this transition plan.

Training Program

The current workforce training program fully relies on training provided by OEMs. There are only three electric buses in HTA's current fleet, with two going into service in 2023. HTA has no fuel cell electric buses yet, although is currently funded to procure eleven FCEBs by 2025. Current training efforts are structured around diesel and gasoline technology. In 2023 – 2025 HTA will be restructuring training programs to prepare for the rapid transition to zero emission vehicles. The remainder of this section describes a draft of this new training program.

Current Workforce Training

Zero emission bus training will be structured around the three ZEV Levels. Maintenance staff are tasked with maintaining all fleet vehicles and supporting infrastructure including fueling infrastructure. The types of trainings assigned to the employee classifications are as follows:

- Mechanic I: Work limited to ZEV Level II
    - General High Voltage Safety and Awareness
    - OEM High Voltage Safety Training
    - OEM Bus Maintenance Orientation
    - OEM Bus Operator Orientation
    - Bus Systems Training
    - Contact Release Rescue
    - Fueling Infrastructure Safety and Familiarization
    - First Aid
- Mechanic II: Assigned ZEV Level III Work
    - All Mechanic I Trainings
    - High Voltage Electrical Systems
    - Fuel Cell & Battery Electric Propulsion Systems
    - Energy Storage Systems
    - Lockout / Tagout
    - High Voltage Personal Protective Equipment (PPE)
    - Fueling Infrastructure Maintenance and Repair

Maintenance management and supervisors are all classified as ZEV Level III. These staff are assigned to the same training courses as Mechanic II. Vehicle support workers (VSW) fuel, clean, detail, and park all buses. VSWs are all classified as ZEV Level II. VSWs receive the same training as operators and receive training in fueling station safety and operations.

Bus operators and operations staff are all classified as ZEV Level II. Operators are trained prior to a ZEB being put into service. The training provides operators with both the academic and behind-the-wheel training needed to efficiently operate these new technologies. Training topics include awareness of high voltage systems, dash controls and indicator lights, start-up and shut-down procedures, and defensive driving. Training meets regulatory requirements per California Highway Patrol, Driver Proficiency. In addition, an efficient driving incentive program is currently in-place using Swiftly and Samsara software services. These services allow comparison of driver performance, GPS and video playback, and real-time management alert systems.

All other staff are classified as ZEV Level I and do not interact with the buses or fueling systems except as passengers and observers. These staff will receive basic awareness and first aid training. For staff who may operate a bus on occasion, they are additionally enrolled in training that meets regulatory requirements per California Highway Patrol, Driver Proficiency.

An example near-term training schedule is shown in Table 13 HTA will be building on this to finalize a training schedule through 2040 that integrates growth in staff size.

Table 13: Near-term example training schedule.

Course Title (hrs.)	Timeline	Personnel Trained	OEM
Electrical and Arc Flash Safety Program	2023	All Staff	G/NF
Develop SOP for BEB	2023	All Staff	G/NF
High Voltage Awareness BEB (3)	2022	All Staff	Gillig
Depot Battery Charger /Charging (2)	2022	Level I, Level II Mech, VSW	Gillig
High Voltage Safety & BEB Familiarization (8)	2023	Level I, Level II Mech	Gillig
High Voltage Lock out Tag Out BEB (8)	2023	Level II Mech	Gillig
Multi Plex System Troubleshooting BEB ((8)	2023	Level II Mech	Gillig
New Flyer Fuel Cell Orientation (3)	2024/2025	All Staff	NF
New Flyer Safety/Familiarization (24)	2024/2025	Level I, Level II Mech, VSW	NF
High Voltage Awareness FCEB (8)	2024/2025	All Staff	NF
New Flyer FCEB Safety & PM (8)	2024/2025	Level I, Level II Mech	NF
New Flyer FCEB Maintenance (32)	2024/2025	Level I, Level II Mech	NF
Ballard Fuel Cell ((24)	2024/2025	Level II Mech	NF
A 123 ESS Battery Training -Vendors (8)	2024/2025	Level II Mech	G/NF
Ballard Fuel Cell 10K PMI (32)	2025/2026	Level II Mech	NF
Thermo King Climate Control BEB /FCEB (8)	2024/2025	Level II Mech	G/NF
Towing Recovery for BEB/FCEB (3)	2024/2025	Level II Mech	G/NF
Hydrogen Fuel Station Safety & Familiarization	2024/2025	All Staff	?
Hydrogen Fuel Station Fueling safety	2024/2025	Level I, Level II, VSW	?
Hydrogen Fuel Station Maintenance / Repair (36)	2024/2025	Level II Mech	?
Siemens ELFA -ZEB (8)	2025	Level II Mech	NF
High Voltage safety & FCEB Familiarization (8)	2025	Level I, Level II Mech	NF
High Voltage Lock out Tag out FCEB (8)	2025	Level II Mech	NF
High Voltage maintenance & repair FCEB (24)	2025	Level II Mech	NF
Trouble shooting & PM, Hands On FCEB (24)	2025	Level I, Level II Mech	NF
ABS Brakes & Air Systems FCEB (16)	2025	Level I, Level II Mech	NF
Suspension & Steering FCEB (8)	2025	Level I, Level II Mech	NF
Cooling Systems FCEB (8)	2025	Level I, Level II Mech	NF
Multiplex Systems FCEB (8)	2025	Level I, Level II Mech	NF
Motor Coach ZEB Training Vendors TBD (80) **Training will consist of everything above for FCEB	2026/27 TBD	Level I, Level II Mech	TBD
Available 5-Week Technical Training Program (200)	TBD	Level II Mech	TBD

New Hire Training

To develop a workforce with the skills required to maintain a zero-emission bus fleet, HTA is working with local colleges and workforce development programs to develop a Zero Emission Vehicle Training Program. This involves training current vehicle maintenance employees and expanding the Vehicle Maintenance staff. HTA will explore working with the Humboldt County Office of Education Trades Academy[11] to engage junior high and high school students early, expose them to career opportunities in the zero emission automotive sector, and increase the local workforce pool. HTA will also collaborate

[11] https://hcoe.org/news/education-at-work/trades-academy/

with Humboldt County Economic Development (GoHumCo)[12] and the Humboldt Workforce Coalition[13] and to explore apprenticeship opportunities with the goal of both boosting recruitment and improving the skillset and experience of applicants. HTA is also considering hiring a full time training position, as shown in Table 12, to manage the increased training workload as well as manage regional collaboration efforts and act as supervisor for apprenticeship positions.

HTA is also collaborating with College of the Redwoods (CR) who currently offers training at the certificate and degree level in Automotive Technology, including instruction and training in Hybrid Electric Vehicle maintenance and repair. The college is committed to developing appropriate additional training opportunities that focus on Zero Emission Vehicles, including hydrogen fuel cell vehicles. The college currently utilizes dedicated funding to support the recruitment of underrepresented students – BIPOC students, women, and Native American students – who have faced systemic barriers related to the pursuit of higher education and career and technical training.

CR also offers robust short-term training through its Adult and Community Education Department that offers targeted training to meet specific workforce needs. This training could help meet the ongoing professional development needs of HTA staff in support of their transition to ZEV technologies.

CR is committed to collaboration and coordination with our K-12 and Cal Poly Humboldt partners to streamline educational pathways that move students from college to careers. K-12, community college, and university partners have worked collaboratively to map out strategies to support the development of new workforce pathways that may be necessary to best support emergent industries in offshore wind, aquaculture, and other port-related industries. College of the Redwoods currently offers robust programs in career and technical education disciplines, including welding, construction technology, automotive technology, aquaculture technology, and computer information systems that will be integral components to meet the changing workforce needs of Humboldt County. CR and HTA will collaborate to take advantage of synergies in HTA's training needs and programs that support the broader cross-sector training efforts in the region.

Since procuring diesel-hybrids in 2007, one Proterra BEB in 2018, and two Gillig BEBs in 2022, HTA has worked with the OEMs for training Vehicle Maintenance employees providing them with the skills needed to repair and maintain electric and battery-electric technology. While some training classes for all-electric buses will need to be developed, much of the curriculum used for the diesel-hybrid can be applied for all-electric buses. This section outlines an initial curriculum framework to ensure a successful transition toward all zero- emission, fuel-cell, and all-electric bus fleet and to prepare a well-trained Vehicle Maintenance department. HTA will collaborate with local workforce development partners and colleges to refine this framework to meet the needs of both HTA and related trades industries.

Basic Courses

Familiarization and Safety Training coordinates with OEMs and internal stakeholders to schedule staff to attend OEM bus familiarization and safety orientations. This training is provided to all staff, at all ZEV Levels.

[12] https://www.gohumco.com/
[13] https://www.gohumco.com/319/Humboldt-County-Workforce-Coalition

Operator Training

HTA has developed training to prepare operators to drive BEBs and FCEBs. The training takes approximately 6hr, added to the traditional training. The focus of the BEB training is to familiarize the operator with the power gages and controls and provide an opportunity to go on a drive so drivers can get a feel of the extra torque and acceleration on turns and inclines. The main considerations in driving an electric bus compared to a hybrid coach are:

- Monitoring the charge level in the BEB / Battery Management
- The difference in the operating noise level of the buses – for example, since electric buses are quieter, it's especially important to notice for pedestrians in the area.
- Differences in the drivers compartment of gages and knobs.
- The extra power and acceleration
- Fueling, including docking into the charging stations and hydrogen fueling process

This training is provided to ZEV Levels II and III.

Familiarization and Safety Orientation

This is an OEM-led class and content typically includes high voltage safety awareness, personal protective equipment (PPE), safety measures, and preventive maintenance. This course includes High Voltage rescue training.

HTA is small enough where all staff interact with vehicle maintenance and fueling areas. Therefore, this course is provided to all staff, all ZEV Levels.

Bus Component Course

Additional OEM classes, beyond that of familiarization and safety include, but are not limited to, air systems, brakes, steering/suspension, door operations, electrical/multiplex systems (from schematics to ladder logics), computer and diagnostic systems, to include troubleshooting pathways. While these course topics are not specifically ZEB technologies, they are pertinent in that these are not static products/components.

This training is provided to ZEV Levels II and III, Maintenance Class and Operations Class.

Advanced Courses

More advanced courses are initially taught by sub-component suppliers and scheduling is often coordinated through the OEM. For example, an OEM will work with staff to schedule the fuel cell manufacturer to teach the specifics of their product(s). Courses taught by sub-component suppliers usually address energy storage systems, electric-propulsion and/or fuel cell systems. Sub-component, supplier-led courses often include topics from safety and high voltage awareness to component functionality and troubleshooting diagnostics.

This training will be provided to ZEV Level III Maintenance staff.

In-House Training

New technology requires strong partnerships with both OEM and sub-component suppliers. The learning curve is steep at first but flattens with practice and experience. HTA's goal is for maintenance trainers/supervisors to teach classes with less reliance on OEMs in the long run. To that end, some ZEB-based courses are now taught by staff and include the following topics: safety awareness for high-

voltage systems and high-pressure hydrogen, operational start-up/shut-down and emergency procedures, familiarization with location and functions of major fuel cell and battery electric components, fueling of fuel cell and charging of battery electric buses. Working partnerships with OEMs has helped tremendously in gaining knowledge and experience.

Avoiding Worker Displacement

HTA does not anticipate any significant risk of displacement of existing staff due to the planned transition to zero emission fleet. The primary impact of this transition is on the maintenance staff. HTA has begun preliminary engagement with staff on this plan. In addition, HTA's maintenance staff is a small and dedicated team of 10 people with strong lines of communication to the Local 1684 union and to supervisors and the general manager. Furthermore, HTA has a history of very high retention of maintenance staff. Compared to much larger transit agencies, there is very little risk of leaving behind current HTA employees.

As HTA implements this plan, HTA will continue to engage with staff and stakeholders to improve on and revise the goals and strategies in this plan.

Training Funding Sources

HTA was successfully awarded funding under California State Transportation Agency Transit and Intercity Rail Capital Program (TIRCP) Cycle 5 to construct a hydrogen fueling station and procure HTA's first eleven fuel cell electric buses. This funding included costs to train maintenance staff on hydrogen technologies. This funding source is kick-starting HTA's training needs, but more funding is needed.

HTA will need additional funding sources to grow and maintain training needs, particularly through 2030 when new technologies and OEMs will be introduced. HTA has submitted applications to TIRCP Cycle 6, FY23 5339(b), and FY23 5339(c) which, if awarded will provide significant additional funding to advance HTA's training needs as well as regional workforce development programs. HTA will continue to seek funding from those sources shown in Table 14.

Table 14: Possible training and workforce development funding sources.

Agency Level	Source
Federal	FTA Formula Funds
	FTA Buses and Bus Facilities Program (5339(b))
	FTA Low and No Emissions Program (5339(c))
State	Low Carbon Transit Operations Program (LCTOP)
	Affordable Housing & Sustainable Communities (AHSC)
	Transit and Intercity Rail Capital Program (TIRCP)
	State Transit Assistance (STA)
	SB1 State of Good Repair (SGR)
Regional	Local Transportation Fund (LTF)

Large Projects Community Benefits Programs

Historically HTA has not funded large construction projects, with nearly all construction projects totaling less than $1M. However, HTA is currently funded to construct a new transit center integrated with affordable housing at a total project cost of over $40M, and is pursuing a redesign and State-of-Good-

Repair replacement of the existing Administration and Maintenance Facility at a total project cost of $80M. These extremely large projects put HTA into new territory with respect to hiring local workforce, implementing Justice 40 recommendations, and understanding potential project impacts on disadvantaged communities.

In addition, these two Mega Construction Projects are in census tracts identified as Disadvantaged by the Climate and Economic Justice Screening Tool (CEJST) 1.0[14]. These census tracts also have multiple workforce development metrics the exceed the threshold as a burden to the communities, as shown in Table 11. These census tracts are also identified as Low Income Communities in the California Climate Investments CalEnviroScreen 4.0 Priority Populations Tool[15].

In collaboration with the Humboldt Workforce Coalition (HWC), HTA is considering adopting one of the first Community Workforce Agreements in the County. HWC is currently funded to support organizations like HTA who are considering developing workforce agreements. HWC's support includes emphasis on hiring and retaining people from hyperimpacted communities and people who face systemic barriers such as women and people of color. HTA will also collaborate with HWC in their effort to develop consistent workforce agreement language across jurisdictions in the County. HTA may include the following requirements of construction contractors in a Community Workforce Agreement:

- Apprenticeship utilization requirement,
- Compliance with Executive Order 11246, Equal Employment Opportunity (30 FR 12319),
- Compliance with Section 503 of the Rehabilitation Act,
- Participation with the Department of Labor's Office of Federal Contract Compliance Programs Mega Construction Project Program if the project is above $35 million.

HTA will also be exploring the U. S. Department of Labor Office of Federal Contract Compliance Programs (OFCCP) Mega Construction Project Program and consider requiring RFP applicants to submit their projects to the Program. In addition, HTA will consider engaging with the OFCCP's Indian and Native American Employment Rights Program (INAERP) as one step in engaging with the many tribal organizations in the County.

[14] https://screeningtool.geoplatform.gov/en/
[15] https://webmaps.arb.ca.gov/PriorityPopulations/