



# Zero-Emission Bus Rollout Plan



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## Section A: Transit Agency Information

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Napa Valley Transportation Authority  
625 Burnell St.  
Napa, CA 94559-3420

NVTA is part of the Bay Area Air Quality Management District and is within the San Francisco Bay Area Air Basin.

Peak Vehicles: 34  
Population: 138,000

Contact Information:

Rebecca Schenck  
Transit Manager  
Phone: 707-259-8636  
rschenck@nvta.ca.gov

NVTA is currently not part of a Joint Zero-Emission Bus Group

## Section B: Rollout Plan General Information

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1. **Does your transit agency's Rollout Plan have a goal of full transition to zero-emission technologies by 2040 that avoids early retirement of conventional transit buses?**

Yes, the goal is for a full transition with no early retirements.

2. **The ICT regulation requires 100% ZEB purchases in 2029. Conventional transit buses that are purchased in 2028 could be delivered in or after 2029. Please explain how your transit agency plans to avoid potential early retirement of conventional buses in order to meet the 2040 goal.**

NVTA does not anticipate purchasing conventional transit buses after 2027. The remaining conventional buses will be retired by 2037.

3. **When did your transit agency's board or governing body approve the Rollout Plan?**

- a. Approval date: April 19, 2023.
- b. Resolution number: 23-10 (Appendix)

4. **Contact information for follow-up on details of the Rollout Plan**

**Primary Contact**

Rebecca Schenck  
Transit Manager

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**Secondary Contact**

Antonio Onorato  
Director of Administration, Finance, and  
Policy

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5. **Who created the rollout plan?** A consultant

- a. **If consultant, please identify the company name:** Stantec Consulting Services Inc.

## Section C: Technology Portfolio

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**What type(s) of zero-emission bus technologies (e.g. battery electric and fuel cell electric buses) does your transit agency plan to deploy through 2040?**

NVTA plans to deploy a fleet of battery-electric buses (BEBs) vehicles through 2040.

## Section D: Current Bus Fleet Composition and Future Bus Purchases

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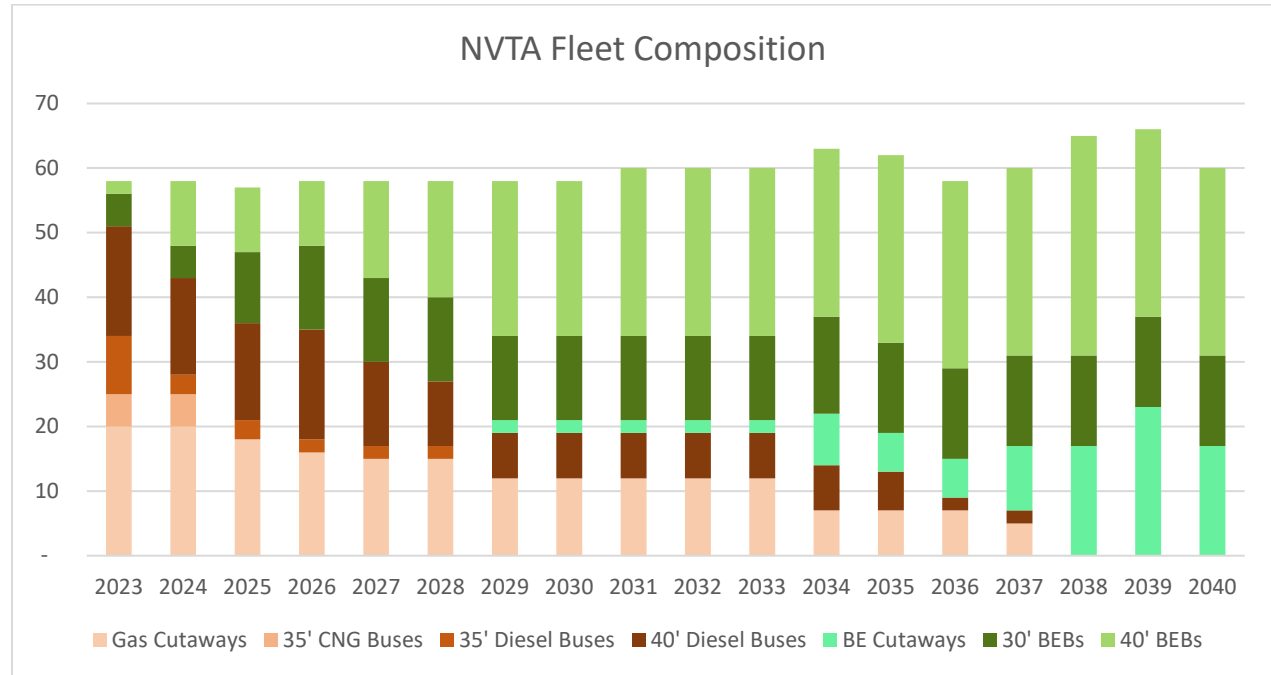
**Table 1 – NVTA Current Fleet**

<b>Bus Length*</b>	<b>Make</b>	<b>Fuel Type</b>	<b>First Service Year</b>	<b>Expected Last Service Year</b>	<b>Standard Service Life (Years)</b>	<b>Quantity</b>
40'	Gillig	Diesel	2002	2014	12	4
Cutaway	Ford Econo	Gas	2007	2014	7	2
Cutaway	Ford Starcraft	Gas	2008	2015	7	2
Cutaway	Arboc	Gas	2011	2018	7	3
Cutaway	Ford Aerotech	Gas	2011	2018	7	3
Cutaway	El Dorado Aerolight	Gas	2011	2018	7	4
Cutaway	Arboc	Gas	2012	2019	7	1
Cutaway	Supreme Trolley	Gas	2012	2024	12	1
Cutaway	Ford Aerotech	Gas	2012	2019	7	2
35'	El Dorado	Diesel	2013	2025	12	5
35'	El Dorado	CNG	2013	2025	12	5
40'	El Dorado	Diesel	2013	2025	12	4
35'	El Dorado	Diesel	2013	2025	12	6
Cutaway	Ford/Glaval	Gas	2014	2021	7	2
Cutaway	Ford Glaval	Gas	2014	2021	7	3
40'	El Dorado	Diesel	2016	2028	12	7
35'	El Dorado	Diesel	2016	2026	12	2
Cutaway	Ford Starcraft	Gas	2016	2023	7	3
Cutaway	Glaval	Gas	2020	2027	7	3
30'	BYD	Battery Electric	2022	2034	12	5
40'	Proterra	Battery Electric	2022	2034	12	2

**Table 1: Future Vehicle Purchases**

<b>Year</b>	<b>Total # of Buses to Purchase</b>	<b># of ZEB Purchases</b>	<b>% of Annual ZEB Purchases</b>	<b>ZEB Bus Type(s)</b>	<b>ZEB Fuel Type(s)</b>	<b># of Conv. Bus Purchases</b>	<b>% of Annual Conv. Bus Purchases</b>	<b>Conv. Bus Type(s)</b>	<b>Conv. Fuel Type(s)</b>
<b>2023</b>	5	1	20%	30' BEB	Electric	4	80%	Cutaway	Gasoline
<b>2024</b>	12	8	67%	40' BEBs	Electric	4	33%	40' Bus	Diesel
<b>2025</b>	6	6	100%	30' BEBs 40' BEBs	Electric	0	0%		
<b>2026</b>	8	3	38%	30' BEBs 40' BEBs	Electric	5	63%	Cutaway 40' Bus	Gasoline Diesel
<b>2027</b>	12	5	42%	40' BEBs	Electric	7	58%	Cutaway	Gasoline
<b>2028</b>	3	3	100%	40' BEBs	Electric	0	0%		
<b>2029</b>	8	8	100%	BE Cutaways 40' BEBs	Electric	0	0%		
<b>2030</b>	0	0	0%		Electric	0	0%		
<b>2031</b>	2	2	100%	40' BEBs	Electric	0	0%		
<b>2032</b>	0	0	0%		Electric	0	0%		
<b>2033</b>	0	0	0%		Electric	0	0%		
<b>2034</b>	13	13	100%	BE Cutaways 30' BEBs 40' BEBs	Electric	0	0%		
<b>2035</b>	3	3	100%	40' BEBs	Electric	0	0%		
<b>2036</b>	8	8	100%	30' BEBs 40' BEBs	Electric	0	0%		
<b>2037</b>	6	6	100%	BE Cutaways 40' BEBs	Electric	0	0%		
<b>2038</b>	16	16	100%	BE Cutaways 40' BEBs	Electric	0	0%		
<b>2039</b>	10	10	100%	BE Cutaways 30' BEBs 40' BEBs	Electric	0	0%		
<b>2040</b>	3	3	100%	40' BEBs	Electric	0	0%		

**Figure 1: NVTA Fleet Makeup Based on Current Bus Fleet and Future Vehicle Purchases**



**Table 3: Projected Procurements Costs Based on NVTA Vehicle Quotes and Bus Price Trends<sup>1</sup>**

	BE Cutaways		30' BEB		40' BEB		Total	
	Count	Cost	Count	Cost	Count	Cost	Count	Cost
2026	2	\$522,562	2	\$995,137	1	\$938,207	5	\$2,455,906
2027					5	\$4,735,428	5	\$4,735,428
2028					3	\$2,870,754	3	\$2,870,754
2029					6	\$5,806,005	6	\$5,806,005
2030								\$0
2031	6	\$1,663,823			2	\$1,991,483	8	\$3,655,305
2032								\$0
2033								\$0
2034	4	\$1,167,159	5	\$3,553,542	2	\$2,095,514	11	\$6,816,215
2035	7	\$2,078,144			3	\$3,198,081	10	\$5,276,225
2036	6	\$1,812,600			8	\$8,678,236	14	\$10,490,836
2037			2	\$1,919,244			2	\$1,919,244
2038			3	\$2,071,842	6	\$6,742,635	9	\$8,814,476
2039			4	\$3,542,925			4	\$3,542,925
2040					3	\$3,494,465	3	\$3,494,465
Total								\$59,877,786

<sup>1</sup> Bus cost in 2023 based on quotes received by NVTA incorporating a price trend up to 2040 based on CARB and industry data.

**Figure 2: Project Procurement Costs**

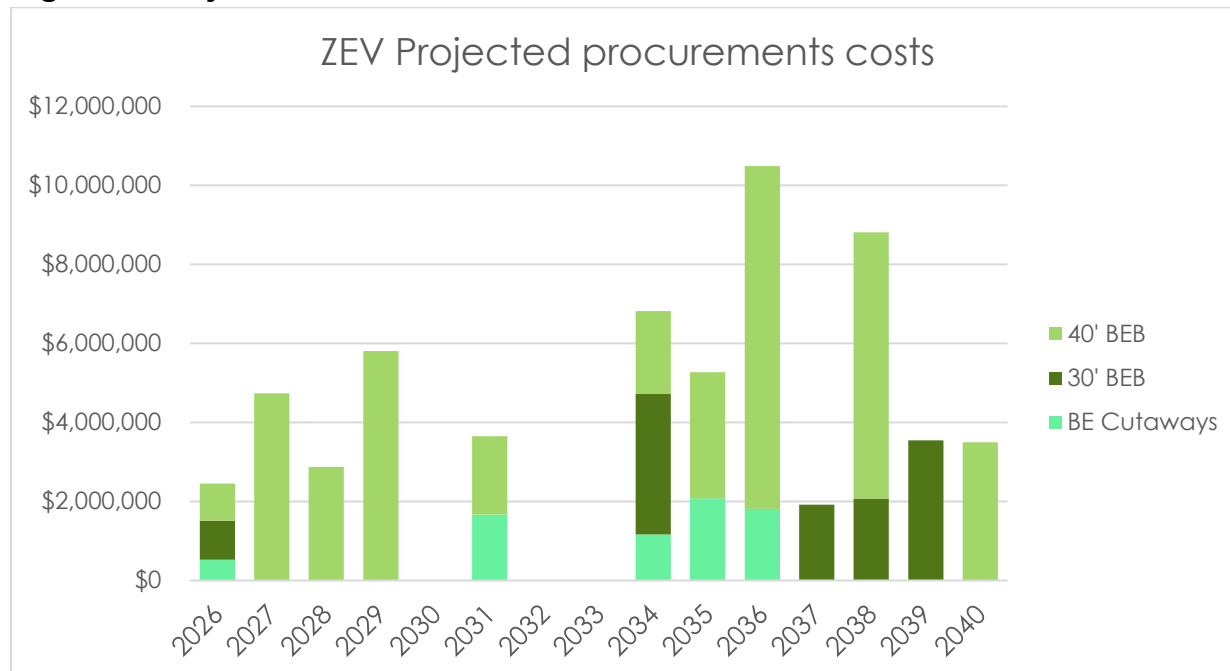


Table 3 and corresponding Figure 2 provide a breakdown of projected vehicle costs based on the vehicle purchase schedule in Table 2. The data comes from vehicle quotes or POs obtained by NVTA, and the bus price trends utilize data from CARB. Considering the charging capacity at NVTA's new Maintenance Facility, the cost of vehicle charging infrastructure was not included in the costs above. Should NVTA need additional charging infrastructure for a later procurements then the cost will need to be added in plan updates.

**Is your transit agency considering converting some of the conventional buses in service to zero-emission buses?**

NVTA is not considering converting conventional buses to zero-emission buses. NVTA will purchase new zero-emission vehicles for replacement of buses per the timeline above.

## Section E: Facilities and Infrastructure Modifications

NVTA is building a new maintenance and administration facility (located at 96 and 101 Sheehy Ct. in Napa) that is anticipated to begin service in 2024. Among other amenities, the facility will include bus charging stations for the agency's planned all-electric fixed-route bus fleet and a secured parking lot large enough to accommodate 74 vehicles.

**Figure 2: Rendering of new Vine Bus Maintenance Facility**



**Figure 4: Vine Bus Maintenance Facility as built, February 2023**



Below is a table of planned facilities and infrastructure modifications.

**Table 4: Facilities Information and Construction Timeline**

Division/ Facility Name	Address	Main Function(s)	Type(s) of Infrastructure	Service Capacity	Needs Upgrade? (Yes/No)	Estimated Construction Timeline
Existing Maintenance Yard	720 Jackson St Napa, CA 94558	Maintenance	One plug-in charger	Transferring capacity to new maintenance yard	No	n/a
New Maintenance Yard	96 and 101 Sheehy Ct Napa, CA 94559	Maintenance	Plug-in charging infrastructure for 74 electric vehicles and maintenance bays to service electric vehicles	74 vehicles	Yes, currently under construction	August 2023
Town of Yountville Corporation Yard	7501 Solano Ave Yountville, CA 94559	DAR Maintenance	Two electric vehicle 250 kW chargers installed. Current electrical capacity allows one charger to be used at a time.	2 vehicles	Yes	Long-term plans to work with the Town to upgrade the electrical infrastructure
City of St. Helena Corporation Yard	1405 Charter Oak Ave St Helena, CA 94574	DAR Maintenance	Two electric vehicle 250 kW chargers installed. Current electrical capacity allows one charger to be used at a time.	2 vehicles	Yes	Long-term plans to work with the City to upgrade the electrical infrastructure
City of American Canyon Corporation Yard	205 Wetlands Edge Rd American Canyon, CA 94503	DAR Maintenance	Plans to have electrical capacity available for one 250 kW charger	1 vehicle	Yes	Working with the City to complete upgrades

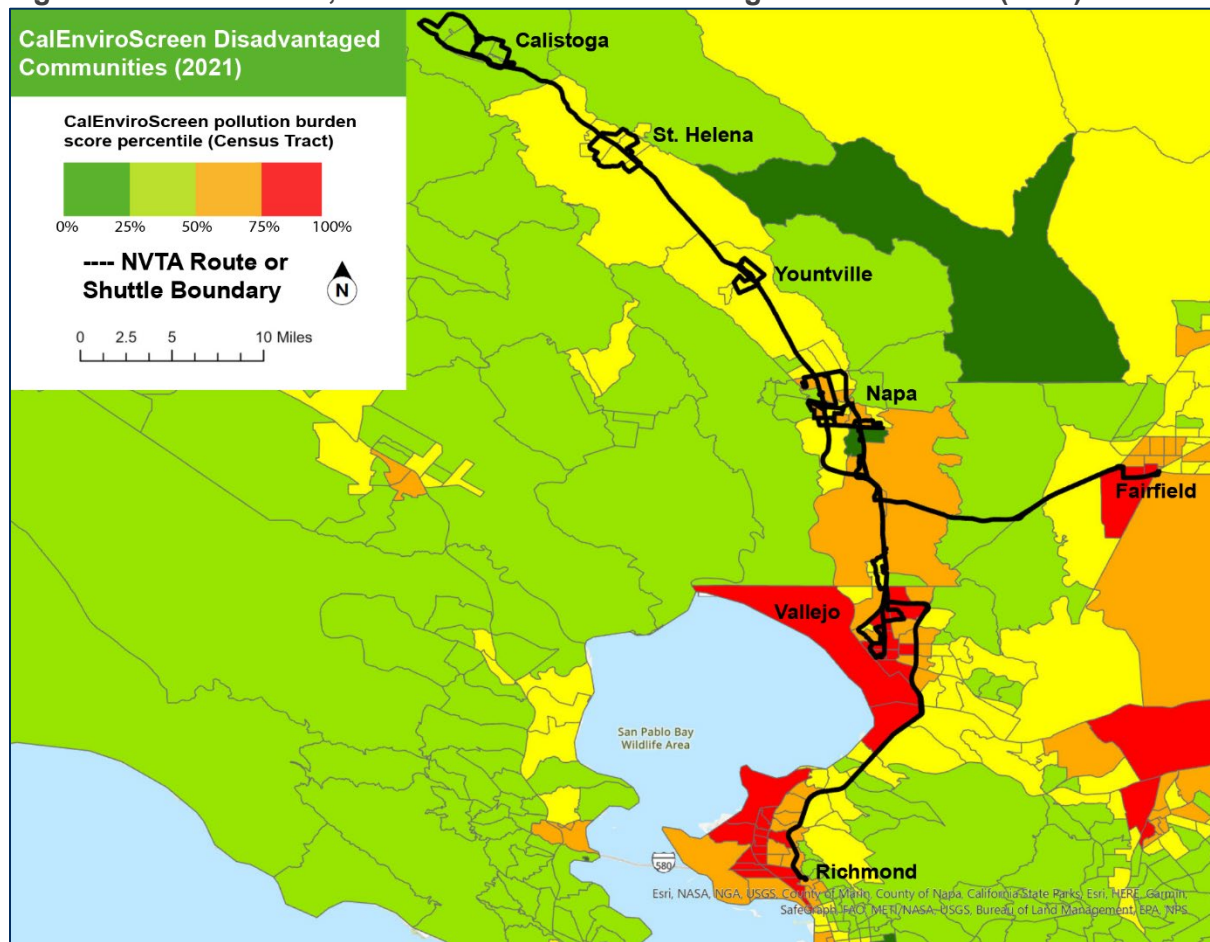


## Section F: Providing Service in Disadvantaged Communities

**Does your transit agency serve one or more disadvantaged communities, as listed in the latest version of CalEnviroScreen?**

Yes, NVRTA reaches thirteen (13) disadvantaged census tracts within its service area according to CalEnviroScreen 4.0. Table 5 lists these census tracts, the communities in which the tracts are located, and the routes that operate within the tracts.

**Figure 3: NVRTA service, CalEnviroScreen Disadvantaged Communities (2021)**



**Table 5: Service in Disadvantaged Communities**

Census Tract ID	Community/Area	Route(s)
6013382000	Richmond	29
6013381000	Richmond	29
6095250801	Vallejo	29
6095250701	Vallejo	29
6095250900	Vallejo	11, 11X

Census Tract ID	Community/Area	Route(s)
6095251600	Vallejo	11, 11X
6095251500	Vallejo	11, 11X
6095251802	Vallejo	11, 11X
6095251901	Vallejo	11, 29
6095251902	Vallejo	29
6095251200	Vallejo	29
6095252402	Fairfield	21
6095252502	Fairfield	21

**If yes, please describe how your transit agency is planning to deploy zero-emission buses in disadvantaged communities (13 CCR § 2023.1(d)(1)(F)). (required)**

Starting with 2025 purchases, BEBs will be deployed in expanded NVRTA service areas and new routes (including in the American Canyon service area). Deploying ZEBs will help reduce noise pollution and positively impact air quality in disadvantaged communities.

## Section G: Workforce Training

**Describe your transit agency's plan and schedule for the training of bus operators and maintenance and repair staff on zero-emission bus technologies.**

Through the Federal Transit Administration's Low or No Emission Vehicle Program (Low-No) funding, NVRTA has been awarded \$317,095 for the development and retention of its workforce. The first part of workforce development would include training sessions for mechanics upon delivery of BEBs from the OEMs (Proterra and BYD). As more vehicles are added to the fleet, additional staff will have access to training resources associated with BEB operations. By increasing the total number of electric vehicles in the NVRTA fleet, the trained work force will be able to apply their new knowledge. As part of the Low-No funding from the FTA, NVRTA is planning on implementing the following training plans:

- a. Apprenticeship programs
- b. Train-the-trainer approach
- c. Retraining/refreshers training courses
- d. ZEB Training from other transit agencies
- e. National Transit Institute Training
- f. Training through professional organizations like the California Transit Association (CTA), American Public Transportation Association (APTA), and others.

## Section H: Potential Funding Sources

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**Please identify all potential funding sources your transit agency expects to use to acquire zero-emission technologies (both vehicles and infrastructure).**

Below are the potential funding sources NVTa will explore to support the acquisition of zero-emission technologies:

Federal Funding sources NVTa is considering include:

- United States Department of Transportation (USDOT)
  - Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants
- Federal Transportation Administration (FTA)
  - Bus and Bus Facilities Discretionary Grant
  - Low-or No-Emission Vehicle Grant
  - Metropolitan & Statewide Planning and Non-Metropolitan Transportation Planning
  - Urbanized Area Formula Grants
  - State of Good Repair Grants
  - Flexible Funding Program – Surface Transportation Block Grant Program
- Federal Highway Administration (FHWA)
  - Congestion Mitigation and Air Quality Improvement Program
- Environmental Protection Agency (EPA)
  - Environmental Justice Collaborative Program-Solving Cooperative Agreement Program

State Funding sources NVTa is considering include:

- Low Carbon Transit Operations Program (LCTOP)
- Transit and Intercity Rail Capital Program (TIRCP)
- California's Hybrid and Zero-Emissions Truck and Bus Voucher Incentive Project (HVIP)
- Affordable Housing and Sustainable Communities Program (AHSC)

Regional/Local Funding sources NVTa is considering include:

- Regional Measure 3 (RM3) Bridge Tolls from the Metropolitan Transportation Commission
- One Bay Area Grant (OBAG) funds from the Metropolitan Transportation Commission

## Section I: Start-up and Scale-up Challenges

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Considerable funding will be required to complete the ZEB transition as ZEBs are more expensive to purchase than conventional vehicles. This presents a significant challenge to the agency, and increased capital and operating budgets will therefore necessitate financial support from federal, state, and local governments.

NVTA has relied on federal and state funding opportunities in the past to support their vehicle procurement, and the agency has submitted a TIRCP grant application for eight (8) new ZEBs. However, as transit agencies across California and the entire United States set targets and goals for ZEB transitions, the pool of potential funds decreases as the competition increases. NVTA can only achieve its ZEB transition by securing funding to replace vehicles and add new ones as needed.

To ensure the successful uptake of ZEBs, NVTA will need to provide high-quality staff training. Maintenance and operations training courses relating to both the ZEBs and accompanying infrastructure will be required. The fuel efficiency of ZEBs is strongly linked to driver behavior, which requires a shift from current driving practices so that the benefits of regenerative braking are realized. The operating range of BEBs can be reduced by as much as 10-20% if vehicles are driven ineffectively. In addition to training, it will be critical to solicit feedback on the ZEBs from the entire labor force through outreach and education activities to engender buy-in and have a successful technology adoption.

While the ZEB Rollout Plan will serve as a useful guide for the ZEB transition, there are many unknowns that will impact implementation. Modern ZEBs have not been on the road in great numbers for a full life cycle (12+ years) to fully understand and predict performance, reliability, and durability, though technology is maturing over time. NVTA will continuously reevaluate ZEBs and fueling infrastructure purchases based on product availability and performance data. Access to information demonstrating how ZEBs perform under a range of conditions, including high heat conditions and near end-of-life operation, will help guide future purchasing decisions. NVTA will track and evaluate the performance of their own vehicles, but it would be useful to share data between agencies so that decisions can be informed by as much data as possible.

It is critical that CARB supports funding initiatives to reduce the financial burden to the agencies as fleets transition to zero-emission. Funding will be required to support capital expenditure for vehicles, fueling/charging infrastructure, maintenance facility upgrades, and workforce training. Funding should also be made available to study the performance of ZEBs under a range of conditions, and the results should be made widely accessible. CARB is well-positioned to facilitate information-sharing between agencies about ZEB performance through educational outreach.

Furthermore, it will be important to track the performance and market availability of Altoona-tested cutaway vehicles that are part of NVTA's current fleet and anticipated to be part of its future fleet, since at this time, there are no vehicles that satisfy funding requirement and operational needs due to range limitations. The successful acquisition, deployment of non-heavy duty transit ZEBs continues to be a challenge for transit agencies and specifically for NVTA's demand-response service portfolio.



## RESOLUTION No. 23-10

### A RESOLUTION OF THE NAPA VALLEY TRANSPORTATION AUTHORITY (NVTA) AUTHORIZING THE ADOPTION OF A ZERO EMISSION BUS ROLLOUT PLAN AND THE SUBMISSION OF THE PLAN TO THE CALIFORNIA AIR RESOURCE BOARD

**WHEREAS**, NVTA is committed to supporting a sustainable future by transition to reduced or zero emission revenue transit vehicles; and

**WHEREAS**, On December 14, 2018, the California Air Resources Board (CARB) passed the Innovative Clean Transit (ICT) regulation which set a goal of fully transitioning all bus fleets in the state to Zero Emission Buses (ZEBs) by 2040; and

**WHEREAS**, The ICT regulation requires small transit agencies to submit a rollout plan by June 30, 2023 detailing their plans to transition their fleets to ZEBs; and

**WHEREAS**, On October, 19, 2020, the NVTA Approved contracting with Stantec Consulting Service, Inc. to develop a Zero Emission Bus Rollout Plan; and

**WHEREAS**, NVTA has worked jointly with Stantec Consulting Services, Inc. to produce a Rollout Plan that outlines a realistic zero emission bus conversion within the timeline required by CARB; and

**WHEREAS**, The Rollout Plan is intended to be a living document and will be updated annually and submitted to CARB; and

**NOW THEREFORE BE IT RESOLVED:** That the Napa Valley Transportation Authority does hereby authorize the adoption of the Napa Valley Transportation Authority's Zero Emission Bus Rollout Plan as a guiding document in pursuit of a full transition to zero-emission buses and infrastructure, in accordance with the California Air Resource Board's Innovative Clean Transit regulation, and authorize staff to submit the Rollout Plan to the California Air Resource Board.

Passed and Adopted the 19<sup>th</sup> day of April 2023.

  
Liz Alessio, NVTA Chair

Ayes: Garcia(2), Joseph(2), Knight(1),  
Williams(1), Eisenberg(1),  
Alessio(5), Sedgley(5), Mohler(1),  
Pedroza(2), Gregory(2), Chouteau(1),  
Dohring(1)

Nays: None

Absent: None

ATTEST:

  
\_\_\_\_\_  
Laura Sanderlin, NVTA Board Secretary

APPROVED:

  
\_\_\_\_\_  
Osman Mufti, NVTA Legal Counsel