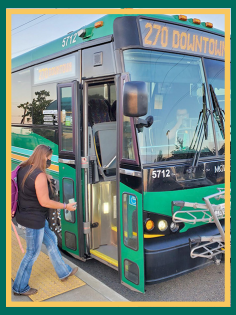
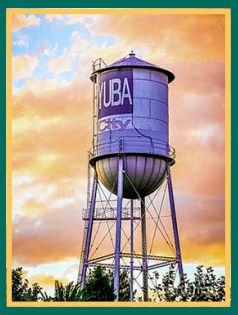
# YUBA-SUTTER TRANSIT AUTHORITY

# ZERO-EMISSION BUS ROLLOUT PLAN




Adopted June 15, 2023

Yuba-Sutter Transit

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# Yuba-Sutter Transit ZEB Rollout Plan

## Yuba-Sutter Transit Information

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Air District: Feather River Air Quality District

Air Basin: Sacramento Valley

Joint Group: Not applicable.

### Plan Creation

The Yuba-Sutter Transit Zero-Emission Bus (ZEB) Roll-Out Plan has been produced in-house by Yuba-Sutter Transit staff. It builds on and complements the Fleet Transition Plan which is required to submit applications for federal funding for ZEBs or ZEB facilities and equipment. The Fleet Transition Plan was last updated in April 2023. For questions pertaining to this ZEB Roll-Out Plan, please contact Planning Manager Adam Hansen at (530) 634-6880 or by email at adam@yubasuttertransit.com.

### Bus Fleet

Yuba-Sutter Transit operates a mixed fleet of 51 buses which consists of 13 MCI D4500 45' over-the-road coaches that are used to operate commuter service between the Cities of Marysville and Yuba City and downtown Sacramento; 22 Gillig 35' buses that operate six fixed routes in Yuba City, Marysville and Yuba County; and 16 Ford and Chevrolet chassis Glaval Titan II 16 passenger cutaway buses that are used to operate rural service for the City of Wheatland, the City of Live Oak, and the Yuba County Foothill communities as wells as to operate the local Dial-A-Ride service in the urban area for Americans with Disabilities Act (ADA) complementary paratransit service as well as for seniors age 65 or older and/or those with a qualifying disability. The current Yuba-Sutter Transit operation requires 29 buses in annual maximum service which is broken down as follows: 12 Fixed Route Buses; 7 Commuter Buses, and 10 Dial-A-Ride Buses

### Zero-Emission Bus Fleet Conversion Policy

In July 2021, the Yuba-Sutter Transit Authority Board of Directors adopted a Zero-Emission Bus Fleet Conversion Policy. This policy committed the agency to the 100% conversion to zero-emission buses by 2035, well in advance of the statewide goal of 2040. This action was contingent upon receiving adequate funding to construct the Next Generation Zero Emission Transit Maintenance, Operations and Administration Facility by 2026 to maintain and operate ZEBs as well as to cover the incremental cost of the new vehicles. With the new facility, the 2035 goal is attainable based on the current fleet replacement plan which assumes the turnover of the entire fleet by that date. This policy was adopted in response to, and in support of, the California Air Resources Board (CARB) adopted Innovative Clean Transit (ICT) regulation (effective October 1, 2019) requiring all public transit agencies to gradually transition their bus fleets zero-emission technologies with a statewide goal of 2040 for full transition.

## ZEB Infrastructure

The NextGen Transit Facility will be designed and constructed with the intent to convert the entire fleet over to battery-electric buses (BEBs). Preliminary analysis shows that the current routes and services offered do not exceed the range of BEBs that are currently available. However, as Yuba-Sutter Transit transitions to a service model with more on-demand service, smaller vehicles will be needed. Battery-electric versions of these smaller vans and cutaway buses do not currently have the range as larger buses due to weight and space constraints. These smaller battery-electric vehicles have advertised ranges of 90-150 miles, but their range is improving as the energy density of batteries increases and manufacturers increase the number of batteries installed on the bus. It is anticipated that these advancements will enable Yuba-Sutter Transit to operate the desired services with BEBs.

The NextGen Transit Facility is also anticipated to include a significant amount of solar energy production and battery storage capacity. The onsite energy production and storage will be installed to increase the resiliency of the system and the ability to respond during natural disasters or significant weather events that may interrupt the electrical grid. The byproduct is that a significant portion of the fueling costs will be offset by onsite power production which will decrease the operating costs for BEBs. While there is little reason to invest the significant amount of funds that would be needed to install the infrastructure for onsite hydrogen fuel production or storage, the NextGen Transit Facility will be planned and constructed in such a way as to not preclude the use of hydrogen fuel if so desired in the future.

## Current Fleet

The Yuba-Sutter Transit Capital Improvement Plan (CIP) contains the vehicle replacement schedule. The schedule does not call for replacement of assets until they have exceeded their useful life often by a few years. Yuba-Sutter Transit does not anticipate removing any conventional buses from service in response to the Innovative Clean Transit regulation.

Yuba-Sutter Transit typically operates buses well beyond their useful life as established by the Federal Transit Administration (FTA) by keeping up on maintenance and repairing or replacing major components such as engines, transmission and differentials if needed. These repairs are the extent of maintenance performed. Yuba-Sutter Transit has no intention of converting any of the existing fleet over to zero-emission technologies.

| Number of Buses | Engine Model Year | Bus Model Year | Bus Make | Bus Model | Fuel Type | Length | Bus Type | Planned Replacement |
|---|---|---|---|---|---|---|---|---|
| 3 | 2009 | 2010 | MCI | D4500 | Diesel | 45 | Over the Road | Retire 2024 |
| 3 | 2012 | 2012 | MCI | D4500 | Diesel | 45 | Over the Road | 2027 |
| 7 | 2018 | 2018 | MCI | D4500 | Diesel | 45 | Over the Road | 2033 |
| 6 | 2013 | 2013 | Gillig | G27B | Diesel | 35 | Standard | Retire 2027 |
| 5 | 2013 | 2014 | Gillig | G27B | Diesel | 35 | Standard | Retire 2027 |
| 11 | 2019 | 2019 | Gillig | 35DD | Diesel | 35 | Standard | 2032 |
| 6 | 2013 | 2014 | Chevy | Titan II 4500 | Diesel | 25 | Cutaway | Retire 2027 |
| 10 | 2019 | 2019 | Ford | Glaval | Gasoline | 24 | Cutaway | 2027 |

*Table 1:Current Bus Fleet with Anticipated Replacement Schedule*

## Vehicle Conversion to ZEB

Yuba-Sutter Transit's CIP includes the fleet replacement schedule as well as the construction of the new NextGen Transit Facility. These two items are tied closely together as the ability to purchase BEBs going forward is entirely based on the timely and successful completion of the new facility. Yuba-Sutter Transit received a State of California Transit and Intercity Rail Capital Program (TIRCP) grant to fund a portion of the NextGen Transit Facility as well as to fund half of the cost of 15 small cutaway BEBs to implement on-demand services and half of an over-the-road BEB to provide service between the Yuba-Sutter area and the City of Roseville. As shown in Table 2, these will be the next buses purchased once the facility is complete, which is anticipated to be in the Spring of 2027. The CIP then calls for all subsequent purchases to be BEBs. Following this planned course of action would result in a 100% ZEB fleet in FY 2033.

| Year | Buses Purchased | ZEB Buses Purchased | % of ZEB Purchased | ZEB Bus Type | ZEB Fuel Type |
|---|---|---|---|---|---|
| 2027 | 15 | 15 | 100% | Cutaway | Battery-Electric |
| 2027 | 4 | 4 | 100% | Over-the-road | Battery-Electric |
| 2033 | 8 | 8 | 100% | Over-the-road | Battery-Electric |
| 2033 | 11 | 11 | 100% | Standard | Battery-Electric |
| 2037 | 17 | 17 | 100% | Cutaway | Battery-Electric |
| 2042 | 5 | 5 | 100% | Over-the-road | Battery-Electric |
| 2045 | 11 | 11 | 100% | Standard | Battery-Electric |
| 2047 | 18 | 18 | 100% | Cutaway | Battery-Electric |
| 2048 | 10 | 10 | 100% | Over-the-road | Battery-Electric |

*Table 2: Bus Procurement Schedule According to the 2023 Capital Improvement Plan*

The chart below shows the mix of vehicles and their fuel type as BEBs are purchased per Table 2 above. By 2033, all vehicles subject to the ICT rule will be BEBs two years ahead of our own 2035 goal.

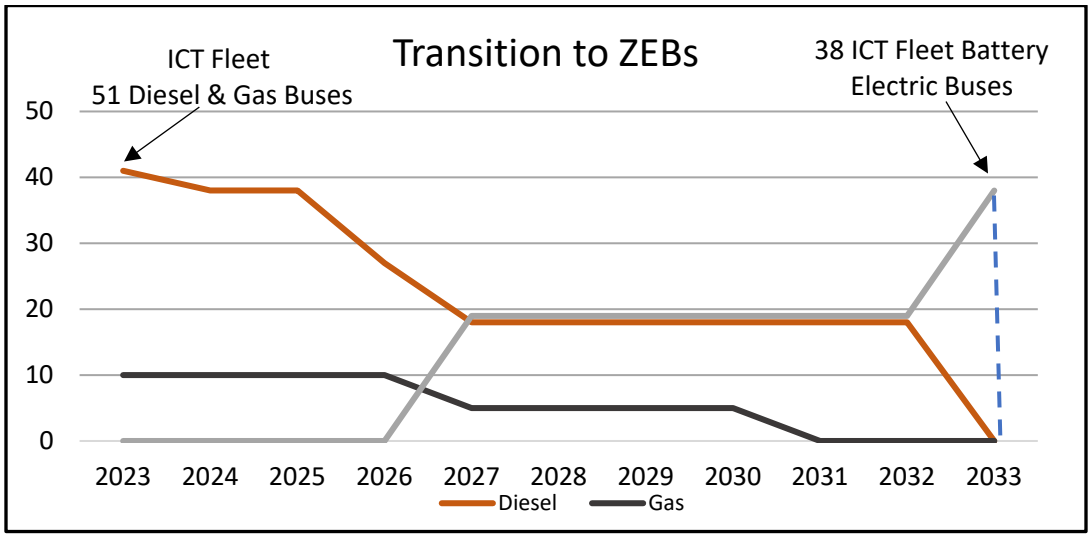


*Table 3: Mix of Vehicles in the Fleet as ZEBs are Purchased*

## NextGen Transit Facility

The current Maintenance and Operations Facility at 2100 B St in Marysville, a former Seven-Up Bottling Company plant that was constructed in 1960, has been Yuba-Sutter Transit's home for maintenance and operations activities since 1996. In 2011, a major remodel of this building and the 3.2-acre property was completed to bring it to its current and maximum operating capacity. The facility has a bus wash, onsite diesel fueling, bus parking, repair bays, operations offices, and administration offices. The facility is working well to meet the current operations and maintenance activities but is inadequate to support the conversion to ZEBs due to being undersized with obsolete utility infrastructure that would require a significant investment to upgrade. A 2018 consultant study found that just 12 BEBs could be operated from the current site before significant investments would need to be made to install BEB charging infrastructure in a space saving manner. Ultimately, space restrictions that would limit future growth and prevent full conversion of the fleet to ZEB technology, which led to the decision to not invest in the current property.

After an extensive site selection study, Yuba-Sutter Transit in 2021 purchased a 19.2-acre site at 6035 Avondale Avenue in Linda for the construction of a new transit maintenance and operations facility that will be designed specifically to fuel, maintain, and operate ZEBs. The new facility will be set up for BEBs, but Yuba-Sutter Transit remains fuel agnostic and will consider any zero-emission technology that could be implemented cost-effectively. As a result, the preliminary layout of the new facility leaves adequate space for a future hydrogen fueling facility should advancements in hydrogen production and storage become cost-effective. In the meantime, a significant amount of solar production capacity with onsite energy storage will be installed to ensure resilience and reduce the cost of fueling ZEBs allowing more capital funds to be available for the purchase of ZEBs. With fuel to be largely provided though onsite power production and storage, it will be beneficial to continue to deploy BEBs into operational service as soon as possible.

The NextGen Transit Facility will provide adequate room for future fleet growth and on-site power production and storage. It is anticipated that the facility will be planned for a 50-year horizon with space for 60 buses in Phase 1 with the option to expand bus parking and charging in the future. Construction is anticipated to start in the Summer of 2025 and be completed by early 2027. The initial facility will have sufficient charging capacity for the 19 BEBs anticipated to be delivered soon after facility completion in 2027. Preliminary plans called for chargers with the capacity to charge two buses so ten chargers will be installed in the initial build to fuel these 19 buses. The charging capacity of the facility will be expanded in 2032 in anticipation of an additional 19 buses being delivered in 2033 at which point all vehicles subject to the ICT rule will be ZEBs.

| Facility Name | Address | Main Functions | Type of Infrastructure | Service Capacity | Needs Upgrade | Estimated Construction Timeline |
|---|---|---|---|---|---|---|
| NextGen Transit Facility | 6035 Avondale Avenue, Linda, CA 95901 | Operations, Maintenance, Parking, BEB Charging & Diesel Fueling | New Facility | 60 | No | Completion Spring 2027 |

*Table 4: Planned NextGen Transit Facility Size and Operational Capabilities.*

## Disadvantaged Communities

A significant portion of Yuba-Sutter Transit's current service area consists of disadvantaged and low-income communities throughout Yuba City, Marysville, Linda and Olivehurst. These communities are currently served by fixed-route, commuter, and dial-a-ride services. When BEBs are purchased in 2027, the four over-the-road coaches will be used to provide service from DACs in Yuba and Sutter counties to job opportunities in the Sacramento Central Business District and a new route that will be connect Yuba City, Marysville, Olivehurst, and Wheatland to the Roseville Galleria Transit Center in Roseville. This route provides access to many of the job centers east of Sacramento as patrons will be able to transfer to Roseville Transit and Placer County Transit at the central transit hub at the Roseville Galleria.

The initial 15 small on-demand BEBs will provide more convenient and direct trips within the current service area for DAC residents. The advantage of the on-demand system is that it reduces the walking and wait times that are now required to access transit as well as significantly reducing travel time. Populations that were previously more than a 1/2 mile from a fixed route bus stop will benefit the most from this change in service. The 15 small BEBs combined with existing and planned Dial-A-Ride fleet will be adequate to serve the four zones to be implemented in Yuba City, Marysville, Linda, and Olivehurst. A fifth zone for Plumas Lake is proposed for a future phase as that area further develops.

| Year | Number of ZEBs | Location of Disadvantaged Community |
|---|---|---|
| 2027 | 4 | Marysville, Olivehurst, & Downtown Sacramento |
| 2027 | 15 | Eastern Yuba City, Marysville, Linda, & Olivehurst |

*Table 5: ZEBs to Serve DACs in the Next Five Years*

## Workforce Training

Yuba-Sutter Transit understands that all operating and maintenance personnel will need extensive training to seamlessly transition to a ZEB fleet. Staff must develop new routines and procedures to handle all aspects of owning, fueling, maintaining, and operating ZEBs. At a minimum, the following positions with the current number of personnel will need sufficient training to safely and efficiently achieve this.

- Drivers (48)
- Dispatchers (6)
- Maintenance (7)
- Utility (6)

## On and Offsite Training

Yuba-Sutter Transit will work with the incumbent private transit service contractor to ensure the necessary training is received. There are a few ways in which this will be achieved. First, Yuba-Sutter Transit is fortunate that several bus manufacturers are accessible within a few hours of our Northern California facility. This will enable staff to attend manufacturer-offered training at their facilities as well as specialized training at Yuba-Sutter Transit's facility. Secondly, when ZEBs are procured, the contract will include the required on-site training for employees that will take place before delivery and for at least one year after delivery. This approach will also be taken with chargers, repair equipment, and the operation of ZEBs. It is also essential that bus operators receive the requisite training to safely and efficiently operate ZEBs. With

new technology, it is anticipated that virtual reality training as well as live virtual reality sessions can be used by OEM instructors to teach or even instruct mechanics in actual repairs remotely.

Yuba-Sutter Transit is working with the local Community College to implement more specialized classes and a ZEB certification to increase the skill of the local workforce and to provide the opportunity for the maintenance technicians employed by Yuba-Sutter Transit's service contractor to receive the necessary specialized training. Through the Yuba College Automotive Technology staff, Yuba Sutter Transit was put in contact with Valley Clean Air Now (Valley CAN) which is a 501(c)(3) non-profit committed to quantifiably reducing air emissions in California's San Joaquin Valley. Valley CAN has worked with high schools and community colleges throughout the San Joaquin Valley to implement curriculum for training technicians to diagnose and repair ZEVs (https://valleycan.org/workforce-training/). Yuba Community College located in Linda near the new Next Generation Transit Facility site, has been coordinating with Valley CAN on curriculum, certifications, classroom lab equipment, and the supplies needed to offer the additional classes to provide a ZEV certificate. Yuba-Sutter Transit will continue to coordinate and partner with Yuba College to get the additional classes up and running as well as explore opportunities to partner through an internship program for students working on their ZEB certification. The local specialized training will be a great asset to those operating and maintaining the Yuba-Sutter Transit ZEV fleet and play a key role in the overall training for maintenance staff.

There are also opportunities through the Federal Technical Assistance and Workforce Development program that will provide technical assistance for training staff. Additionally, Sunline Transit Agency located in Thousand Palms, California operates the West Coast Center of Excellence in Zero Emission Technology. Below is the list of classes that the Center currently offers to provide essential training to guide and assist the ZEB implementation process. Yuba-Sutter Transit has been in contact with Sunline staff on the availability and schedule of these essential training courses.

- Overview
    - New leadership role with ZEB adoption
    - Establishing agency mission and policies to support ZEB fleet and expansion
    - Encouraging organizational cultural shift
    - Developing staff ownership of ZEBs
- Zero-Emission Bus Overview
    - Introduction to ZEB technology
    - Differences between ZEBs and incumbent technologies
    - ZEB demonstrations globally
    - Introduction to ZEB fueling
    - ZEB and fueling vendors
    - Industry standards developed and in development
- Zero-Emission Bus Operations
    - Introduction to zero-emission bus technology
    - Differences between ZEBs and incumbent technologies
    - Dashboard familiarization
    - ZEB fueling training
    - Preventing road calls
- Zero-Emission Bus Maintenance
    - Introduction to ZEB technology

    - Differences between ZEBs and incumbent technologies
    - Preventative maintenance practices for ZEBs
    - Unscheduled maintenance practices for ZEBs
    - General and high-voltage safety training
    - Basic diagnostics and troubleshooting
- Fiscal Management
    - ZEB grant management
    - ZEB total cost of ownership
    - Funding opportunities
    - ZEB budget development
- Zero-Emission Bus Procurement
    - Federal Transit Administration guidelines for ZEBs
    - American Public Transportation Association White Book: Zero-Emission Technical Standards
    - Contract Options for ZEBs
- Zero-Emission Bus Policies and Regulations
    - Federal Transit Administration guidelines for ZEBs
    - American Public Transportation Association White Book: Zero-Emission Technical Standards
    - Contract Options for ZEBs
- Planning for ZEB Operation
    - Federal Transit Administration guidelines for ZEBs
    - American Public Transportation Association White Book: Zero-Emission Technical Standards
    - Contract Options for ZEBs

As more ZEBs are put into commercial and public service, additional training programs and opportunities will arrive such as online classes. Yuba-Sutter Transit's contract maintenance staff will complete the Inspecting Electric Drive Commercial Vehicles sponsored by the Federal Motor Carrier Safety Administration in partnership with the Commercial Vehicle Safety Alliance to introduce them to ZEBs. This training as well as other options and opportunities already discussed will prepare staff for the completion of the Next Generation Transit Facility in 2026 and the arrival of BEBs in 2027.

## Funding Opportunities

Yuba-Sutter Transit has been pursuing multiple funding opportunities over the past few years in preparation for the introduction of ZEBS. Multiple requests for funding have been submitted to regional, state, and federal programs. Table 5 below lists many of the sources available for infrastructure and bus procurement.

| Type | Agency | Program |
|---|---|---|
| Federal | United States Department of Transportation (USDOT) | Rebuiding America Infrastructure with Sustainability and Equity (RAISE) Discretionary Grant Program |
| | | Capital Investment Grants – New Starts |
| | | Capital Investment Grants – Small Starts |
| | | Transit Infrastructure Project Appropriation |
| | | Transportation Infrastructure Finance and Innovation Act (TIFIA) loan |
| | 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 & Rural Area Formula Grants |
| | | State of Good Repair Grants SGR) |
| | | Flexible Funding Program – Surface Transportation Block Grant Program |
| | US Department of the Treasury | New Market Tax Credits |
| | | Opportunity Zones |
| State | California Air Resources Board (CARB) | Low Carbon Fuel Standard Credits |
| | | Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) |
| | | Cap-and-Trade Funding |
| | | State Volkswagen Settlement Mitigation |
| | | Clean Mobility Options |
| | California Energy Commission | California Lending for Energy and Environmental Needs (CLEEN) |
| | | Clean Transportation Program |
| | California Transportation Commission (CTC) | Solution for Congested Corridor Programs (SCCP) |
| | California State Transportation Agency | Transit and Intercity Rail Capital Program (TIRCP) |
| | California Department of Transportation (Caltrans) | Low Carbon Transit Operations Program (LCTOP) |
| | | State Transit Assistance (STA) funds |
| | | State of Good Repair (SGR) |
| Local | SACOG Grant Programs | SACOG Regional Program: Transformative |
| | | SACOG Regional Program: Maintenance & Modernization |
| | Yuba-Sutter Transit | Joint Development |
| | | Sale of excess facility |
| | | Advertising revenues |
| | | Farebox |
| | | Local Transportation Funds (LTF) |
| | | Public-Private Partnership |

*Table 6: List of Potential Funding Sources to Fund Capital Facility Improvements and Vehicle Procurements*