Chapter 10
CAPITAL ALTERNATIVES

This chapter focuses on the capital items needed to operate public transit, focusing on buses and bus stop facilities.

Zero Emission Bus Technology

Roseville Transit's fleet is currently a mix of diesel and gasoline fueled vehicles. The California Air Resource Board (CARB) is in the process of developing new regulations (the "Transit Fleet Rule") that are expected to ultimately require all public transit fleets in the state to use only Zero Emission Bus (ZEB) vehicles. ZEB technologies consist of Battery Electric Buses (BEBs) and hydrogen fuel cell buses. However, in 2009 staff concluded that the technology was not commercially ready and the Board directed staff to withhold the ZEB purchase requirement. Since that time CARB staff has been evaluating the commercial readiness of zero-emission technology. In 2015 staff concluded that the commercialization of ZEB technologies had advanced to the point where they may feasibly be incorporated into transit fleets. Staff is now in the process of proposing amendments to the Transit Fleet Rule. A draft proposal, called the Innovative Clean Transit Regulation is summarized below.

The regulation would apply to all public transit agencies that own, lease, or operate buses with a gross vehicle weight rating greater than 14,000 lbs. In the draft proposal, buses subject to the regulation include cutaway buses, transit buses (including bus rapid transit), articulated buses, double-deckers, commuter coaches, trolley buses and vintage trolley buses. Based on comments received on the draft, however, CARB staff has indicated that cutaway buses will not be included in the initial implementation requirement as there are currently no ZEB Altoona-tested[7] cutaway vehicles and it is unclear when manufacturers may begin testing for zero-emission cutaways.

The following is a summary of the overall rule proposal. Fleet size would be based on the number of buses in the active fleet in 2019.

<u>January 1, 2020</u>

- Large transit fleets with 100 buses or more would need to:
  - Purchase 25 percent ZEB when bus purchases are made or implement an equivalent innovative zero emissions mobility program.
  - Purchase renewable fuels when diesel or natural gas contracts are renewed.
  - Report fleet-wide information for all modes and fuel purchases needed to evaluate their progress in meeting a fleet-wide performance-based goal.
- All transit agencies in more polluted areas of California would be required to purchase low NOx engines if available at the time of conventional bus purchases.

[7] FTA regulations require all federally-funded transit vehicles models be tested in a facility located in Altoona, PA.

January 1, 2023

- The proposed concept would be expanded to include medium-size transit fleets with more than 30 buses.
- Affected transit fleets would need to meet a 50 percent ZEB purchase requirement.

January 1, 2026

- All transit fleets, including smaller transit systems would need to meet a 75 percent ZEB purchase requirement.

January 1, 2029

- All bus purchases would need to be ZEBs.

The purchase requirement applies at time of normal purchase and does not require any accelerated purchases. Transit agencies that make ZEB purchases before they are required by the regulation would generate a ZEB credit that could be banked and used for a future purchase date.

Staff is also proposing an "innovative zero emission" credit mechanism that would count towards the ZEB purchase requirement. Innovative zero emission mobility options are non-bus (nor fixed guideway) transportation services provided by the transit agency with lighter Zero Emission Vehicles (ZEVs) like micro transit, on-demand van or car transportation, or autonomous shuttle services. The transit agency would need to apply to the CARB Executive Officer to determine the appropriate credit amount for new and innovative services based on the details of the program. The credit would be provided in the form of a ZEB purchase credit where 350,000 zero emission passenger miles per year from the program would be deemed to be equivalent to purchasing a ZEB.

As noted above, CARB is currently in the process of meeting with transit agencies to understand the impacts of the proposed rule and to modify the rule as necessary. Another change under consideration is to allow each transit agency to develop and submit an individualized plan, approved by their board, for a transition to zero emissions, including their start date. Staff is interested in providing this flexibility but also wants to encourage near-term action. CARB staff plans to bring a proposed recommendation to the CARB board in June 2018.

With the exclusion of cutaway buses, Roseville Transit's bus fleet consists of 29 large buses, just within the 30 bus criteria for a small-sized fleet. As such, the City is not required to be purchasing ZEBs until 2026 (under the current proposal). However, it is clear that operators of all transit fleets should be preparing for ultimately transitioning to ZEB fleets over time. Of the two ZEB technologies, by far the more prevalent option is Battery Electric Buses.

Battery-Electric Transit Vehicles

Technology and experience for battery-electric transit vehicles are still fairly new. Some larger transit systems and mid-sized system have purchased battery-electric buses, with many more on order. The closest existing BEB fleet to western Placer County is the 17 buses at the San Joaquin RTD system in Stockton. Recharging BEB's can either occur at the fleet operations facility (generally overnight using a slow charging station), or along the route at stops where at least 10 minutes of time are available (using an overhead fast-charging technology). As an example of cost, Marin County recently purchased two battery-electric vehicles for $1.6 million. The cost includes purchase of the buses, GPS and fare collection equipment purchase and vehicle inspections.

Beyond the issue of cost, a key factor regarding battery electric buses is the potential range between charges. While buses with a range of 120-150 miles have been available for several years, some manufacturers have recently announced new technology that can operate up to 350 miles between charges – much more than Roseville Transit's daily mileage per bus. However, these claims do not reflect the requirements to also power onboard heating and cooling systems – an important consideration in Roseville's hot summers.

Vehicle Replacement

A review of Roseville Transit's vehicle fleet shows that the following buses will be eligible for replacement over the next seven years based on age:

- Currently eligible for replacement – 1 fixed route 28 passenger bus, 4 commuter buses, 3 DAR vehicles
- 2019 – 4 fixed route 29 passenger buses, 8 DAR vehicles
- 2021 – 7 commuter buses
- 2026 – 4 fixed route vehicles (CARB purchase rules apply)

In order to maintain a good working fleet with minimal maintenance costs, Roseville Transit should seek grant funding to replace vehicles according to the schedule above. By the end of the planning period, Roseville Transit should be purchasing ZEB vehicles in accordance with CARB regulations.

Bus Stop Improvements

Passenger facilities include all equipment and amenities that serve the passenger as they access the bus. This includes bus stop shelters, benches and signs, information kiosks, pedestrian crossing amenities and transfer centers. The quality of passenger amenities is a very important factor in a passenger's overall perception of a transit service. Depending on the trip, a

passenger can spend a substantial proportion of their total time using the transit service waiting at their boarding location. If this is an uncomfortable experience, if it is perceived to be unsafe, or if it does not provide adequate protection from rain and inclement weather, the bus stop can be the deciding factor regarding a potential passenger's use of the transit system.

A bus shelter is typically considered to be warranted at stops with a minimum of 10 passenger boardings per day[8]. A review of the existing location of shelters compared with observed passenger activity indicates that the following stops warrant a shelter:

- Woodcreek Northbound after Junction
- Pleasant Grove Westbound at Foothills

Passenger amenities should be replaced as need during the planning period. If an alternative with a new route alignment is chosen, bus stop signs and pullouts will need to be constructed.

While a Caltrans facility, the Taylor Road Park-and-Ride needs improvements. This is the single busiest commuter bus boarding location on the Roseville system (as well as the PCE system). In particular, a minimum of two large shelters should be provided, along with additional overhead street lighting.

The facilities provided at three of the four key hubs in the Roseville system (Civic Center, Galleria and Auburn/Whyte) are adequate and in good condition. Improvements would be beneficial at the Sierra Gardens Transfer Point. This location consists of a pull-out along the south side of Sierra Gardens Drive between North Sunrise Avenue and Santa Clara Drive, behind the Placer Village shopping center. It is provided with two bus shelters, and has adequate sidewalk width to accommodate wheelchair loading/unloading as well as sidewalk connections to other nearby destinations. The bay is adequate to accommodate up to three transit vehicles at a time (under the current schedule there are a maximum of two vehicles at this location at the peak times). The location is difficult to serve for buses traveling in the westbound direction. As a result, Route L serves a stop on the north side of Sierra Gardens Drive at Santa Clara Drive, 100 yards to the east. No passenger amenities are provided at this location. A 3-way Stop control of this intersection provides some protection to passengers walking between the bus stop locations. A deficiency of this overall location is that overhead lighting is not sufficient for the main stop (eastbound direction). In addition, a bus bench is warranted for the westbound stop. Construction of improvements at this is already scheduled for 2018.

[8] For example, the transit design guidelines for the Sunline Transit Agency (California), El Dorado Transit (California), Regional Transit District (Colorado), Pima County (Arizona) and Denton (Texas) all cite 10 boardings per day as a standard for warranting a shelter.