



DEPLOYMENT SPOTLIGHT

PROTERRA ZX5 40' TRANSIT BUS



PROJECT SUMMARY

Proterra provided the San Joaquin Regional Transit District (SJRTD) with 10 ZX5, formerly known as Catalyst FC,* 40-foot electric transit buses (model year 2018) for public transportation under the Zero Emission Truck and Bus Pilot Program. These buses operated on bus rapid transit (BRT) routes in the city of Stockton, the first U.S. city to host an all-electric BRT route. SJRTD continued to use Proterra’s electric transit buses after this pilot project’s completion, which lasted from January 2018 to December 2018.

**Proterra officially launched its ZX5 model in September 2020, discontinuing its Catalyst FC model.*

DUTY CYCLE



Vocation
*Public Transit
BRT*



Average Daily
Distance
122 miles



Average Daily
Speed
18 miles per hour



Average
Temperature
- Summer
92 F

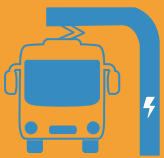


Average
Temperature
- Winter
55 F

Operational routes varied in length between 17-38 miles with one to three hours per trip. These routes did not experience significant elevation changes. On average, the vehicles drove three to five trips per day.

San Joaquin County experienced temperatures between 56-108 F in summer months and 32-79 F in winter months during the data collection period.

CHARGING



Charger
Type
*500 kW
Proterra
overhead
fast-charging
pantograph*



Charging
Methodology
*On-Route
Day
7.7-9.5 minutes
per charge*

The buses charged 10-14 times per day using the overhead fast-charging pantographs with proprietary single-blade connectors installed in Stockton’s downtown public transit hub. These charging events added up to 60% state of charge to the battery pack.

PERFORMANCE



Energy
Efficiency
*2 kWh/mile**



Miles per Gallon
Equivalent
*17 MPGe**

**Certain factors can significantly affect the range and efficiency of electric vehicles (EVs), especially ambient temperature, topography, speed, and load. These factors must be considered when selecting a suitable EV to meet a specific duty cycle.*



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FUNDING

This deployment was funded partly by the California Air Resources Board under the Zero Emission Truck and Bus Pilot Program and partly by the Federal Transit Administration. SJRTD owned and continued operating the electric transit buses after the project's end date.



TRAINING AND WORKFORCE DEVELOPMENT

Proterra provided training in operation, maintenance, and basic diagnostics of their fast-charging transit buses. Drivers quickly adapted to using and charging the electric buses.



RECOMMENDATIONS FOR FUTURE DEPLOYMENTS

1. Proterra's ZX5 electric transit buses successfully met range requirements for 75% of SJRTD's routes. It is important to recognize that on-route fast charging and overnight/depot charging each have a place in the market. On-route charging provides the possibility of operating all day without long charging sessions – ideal for buses on short, frequent routes – and cost savings on battery maintenance and replacement. Buses that have larger batteries and require longer charging sessions, however, are designed to meet the daily range of a conventional diesel bus. Use the [Transit Agency Infrastructure Planning Tool](#) guide and check out CALSTART's [Infrastructure INSITE](#) tool for more information on the zero-emission infrastructure development process, appropriate equipment, and cost and time estimates.
2. Transit agencies need to implement cost-saving strategies for on-route overhead fast charging to control demand charges and reduce energy usage during peak hours. Visit Microgrid Labs' [EVOPT](#) tool to start developing a managed charging strategy that works for your fleet.