

Advanced Clean Transit Reducing Emissions from Transit Fleets

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This summary describes how transit fleets are part of California's strategy to transition heavy-duty vehicles to zero and near-zero emission technologies to meet air quality, climate and public health protection goals.

What are California's air quality and climate goals?

California faces very challenging mandates to reduce air pollutants in order to meet the federal air quality standards and State climate change goals. To date, California has made significant progress and is on track to meet the AB 32 goals of reducing Greenhouse gas (GHG) emissions to 1990 levels by 2020; however, we need to continue making progress beyond 2020 to meet the following goals:

- Federal health-based ambient air quality standards (key milestones in 2023 and 2031)
- 40% reduction in GHGs by 2030
- 80% reduction in GHGs by 2050
- Up to 50% petroleum use reduction by 2030

New federal ozone standards (0.070 ppm) will require additional actions to reduce smog and protect public health. Meeting all of these goals requires nothing short of a bold transformation in all sectors including stationary, industrial, residential, and transportation with significant contributions from public agencies, private businesses and individuals.

What is the role for transit fleets?

Public transit agencies have played, and will continue to play, an important role in helping California meet air quality standards and greenhouse gas emission reduction goals; namely, by employing the cleanest technologies, providing safe and reliable public transit services to reduce light-duty passenger vehicle miles traveled and single occupancy trips, and reducing congestion on roadways. Transit fleets operate in local communities and have a key role, not only in helping transit-dependent riders, but also in helping to shape transportation and land-use around our communities.

What is the Advanced Clean Transit initiative?

The Advanced Clean Transit initiative is a proposed measure with a combination of incentives, and/or other methods that would result in transit fleets purchasing advanced technology buses during normal replacement and using renewable fuels when contracts are renewed. The concept would phase in cleaner technology over the next two decades and would consider flexibility to allow transit fleets to implement advanced technology in ways that are synergistic with their existing operations and would enhance passenger mobility. The concept would potentially recognize early actions to reduce emissions, alternative modes of zero emission transportation (e.g., light-rail), and other innovative methods to transport passengers more efficiently to their final destination (like car sharing vouchers, or bicycle sharing programs). A key goal is to ensure the emissions benefits are realized in disadvantaged communities while maintaining or expanding transit service. The goals would be consistent with and complementary to regional sustainable community plans and existing requirements for low carbon transportation fuels.

What advanced technologies are available for transit buses?

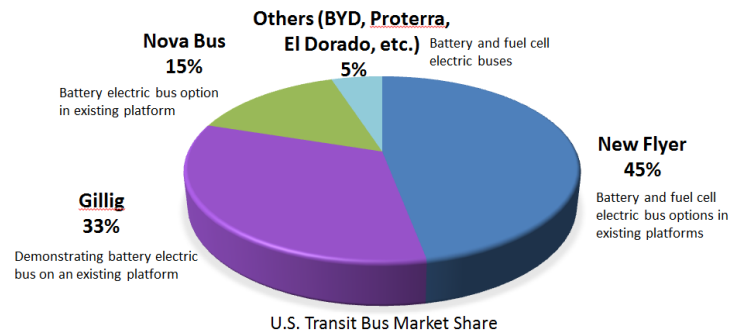
Zero emission battery electric and fuel cell electric buses, hybrid buses, and clean combustion engines that operate on renewable fuels may all play a role. In March of 2016, the first engine that was certified by ARB to an optional engine standard that has 90% lower NOx emissions compared to current engine standards became commercially available that operates on compressed natural gas. Diesel engines are also expected to be certified to lower optional NOx emissions standards in the near future. GHG emissions are reduced by the Low Carbon Fuel Standard (LCFS) regulation that requires fuel refiners and importers to lower the carbon intensity of transportation fuels sold in California by 10 percent by 2020 or to purchase credits from others. The LCFS credits have made renewable diesel and renewable natural gas available to fleet owners at similar cost as conventional fuels. Fleets that use low carbon transportation fuel contribute to meeting the goals of the LCFS regulation. Finally, there are more than a dozen models of zero emission battery electric and fuel cell electric buses that are commercially available from several bus manufacturers that achieve additional NOx and GHG reductions.

Are any transit fleets operating zero emission buses?

Yes, a number of transit agencies in California are providing daily service with zero emission buses and are expanding their zero emission bus fleets. Other agencies are also beginning to incorporate zero emission buses into their fleets for the first time. As of June 2016, there were 88 zero emission battery electric and fuel cell electric buses operating in California, and 162 more were on order. We are also seeing an expansion of zero emission bus fleets outside of California – both nationally and internationally. Now there are more than 60,000 zero emission buses operating worldwide.

Are zero emission buses sold only by a handful of manufacturers?

No, nearly all U.S. transit bus manufacturers have now entered the zero emission bus market with one or more commercial zero-emission bus models. There are dozens of models available in multiple configurations. The figure on the right shows the market share for bus manufactures and the types of zero emission buses that are available from each. Several companies are manufacturing zero emission buses in California including BYD, El Dorado, EBus, Motiv, and US Hybrid. GreenPower and Proterra each have plans to open a manufacturing plant in California. Gillig is based in Hayward, California, and is currently demonstrating vintage trolley battery electric buses on an existing platform.



Source: New Flyer, 2014

How can transit fleets afford to operate zero emission buses?

Today, battery electric buses can meet the needs of transit fleets for a substantial part of their service with a total cost of ownership that is becoming comparable to conventional buses because of lower maintenance and operational cost savings. Some zero emission bus manufacturers also have financing options that bring the up-front capital costs in line with those of conventional vehicles where the lease payments can be made with the annual maintenance and operational cost savings. Battery electric bus prices are continuing to come down each year as battery costs decline and as bus production increases. By 2020, battery electric buses are expected to have the same or lower cost of ownership for nearly all fleets in California. The cost for fuel cell electric buses are still relatively high, but they are also declining, especially with larger orders. Some of the costs savings for zero emission bus owners comes from Low Carbon Fuel Standard credits that transit fleets can earn and sell on the open market to offset some or all of the electricity costs or to reduce hydrogen production costs. Incentives can also offset some of the early investments needed for transit fleets to begin transitioning to zero emission buses.

What funding programs are available for advanced technologies?

Several funding programs are available to support the use of advanced technologies administered by Federal and State agencies and local air districts. For more information about funding opportunities please go to www.arb.ca.gov/ba/fininfo.htm.

Where can I get more information?

Fact sheets, compliance tools and documents about Advanced Clean Transit are available at www.arb.ca.gov/msprog/bus/bus.htm. If you have questions or wish to obtain this document in an alternative format or language, please call (916) 323-2927. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.