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Project Title:
Fuel Cell Electric Bus, Battery Electric Bus, and
Battery Electric Train Infrastructure

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Fuel Cell Electric Bus, Battery Electric Bus, and Battery Electric Train Infrastructure

Understanding the key issues in fuel cell electric bus, battery electric bus, and battery electric train infrastructure

WHAT IS THE NEED?

The California Air Resources Board (CARB) is developing strategies to transition the heavy-duty mobile source sector to zero and near-zero emission technologies to meet air quality, climate, and public health protection goals. The long-term vision of the Innovative Clean Transit effort is to achieve a zero-emission transit system by 2040.

Transit agencies have often been leaders in facilitating the introductions of new technologies and have been partners in addressing air quality by continuing to be instrumental in leading adoption of low nitrogen oxide engines, zero emission technology deployment in heavy duty vehicle applications, and in addressing barriers.

To meet this ambitious goal, it is important that not only electric buses and trains, but also supportive infrastructure be in place. Mapping and cataloging the infrastructure support the overall goal and policy of increasing Zero-Emission Buses (ZEBs) and Battery Electric Trains (BETs).

This research project provides an opportunity to learn about charging buses and electric trains that operate all day on battery and re-charge at night at the depot. As electric bus ranges increase, this could be an option to keep buses in service during the day and allow them to charge at night at lower utility rates, but this could have impacts in terms of bus storage needs. Most diesel buses are maintained at night and therefore additional storage/charging space would be needed as agencies transition to electric fleets. Ultimately, the research team will analyse the necessity needed for a complete transition of public transit fleets to zero emission.



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WHAT ARE WE DOING?

Department of Rail and Mass Transportation (DRMT) staff will work with the researchers to discuss project objectives and scope to determine the target infrastructure.

This project includes:

- Studying ZEBs, particularly Fuel Cell Electric Buses, Battery Electric Buses and BETs for further infrastructure needs.
- Investigating existing infrastructure for ZEBs and BETs.
- Mapping and categorizing the existing ZEB and BET infrastructure in California.
- Determining the optimal infrastructure conditions based on ZEB and BET technology's specifications and anticipated use.
- Identifying the deficiencies between the existing infrastructure and optimal infrastructure. The research team will prepare a report to document these findings; and include maps, technical specifications, and other materials.

WHAT IS OUR GOAL?

The study focuses on determining the infrastructure deficiencies that hinder the adoption of ZEBs and BETs in California. The research team will develop a report that catalogs, describes, and analyzes the current locations of ZEB- and BET-supporting infrastructure.

Besides, any important accompanying documentation will be included in the final report, such as a map of infrastructure components, utility company service areas, and air quality management districts. It will also contain the planned infrastructure components and cost figures if available.

WHAT IS THE BENEFIT?

The deployable product will be a final report that identifies ZEB and BET infrastructure needs and current conditions. These needs could be met by theoretical applications that are currently in development and examined by this research, which will provide guidance on where such infrastructure should be located.

Moreover, the research findings can be a foundation for future research to assess the effectiveness and use of ZEB and BET infrastructure. It will also provide costs and benefits analysis for the infrastructure; and pinpoints the types of projects that are most effective as a source of power for ZEB and BET vehicles.

WHAT IS THE PROGRESS TO DATE?

The research team has administered the kickoff meeting. Next, they will invite more subject matter experts to join the project panel and discuss the direction of this research.