



Plan your Infrastructure to fit your Operations

10:25 a.m. – 11:10 a.m.



Infrastructure Challenges for Electric & Hydrogen

Infrastructure remains to be the Biggest Barrier to ZEB Deployment!

Electric

- Deployment Lead Time
- Costly Upgrades
- Space Constraints
- Demand Charges
- Lack of Technical Assistance

Hydrogen

- Need Assistance with Station Evaluation
- Space Constraints
- Price of Fuel
- Fuel Sourcing Options
- Lack of Shared Lessons

Your Infrastructure Check List

- Fleet Deployment Goals
- Project Team
- Utility Point of Contact
- Staff Engineer (External)
- Estimated Project Timeline
- Capital Budget for Project
- Available Zero Emission Bus Options
- Charging and Fueling Options
- Available Incentive Programs
- Permitting Requirements
- Codes and Standards



INFRASTRUCTURE PLANNING TOOL

A Transit Fleet's Guide to Successful Electric Bus Charging

Going Electric

Are you a transit fleet? Have you thought about moving your fleet towards electrification? Or, have you already decided to go electric? If so, hold the brakes! Before you choose your electric bus technology and begin the procurement process, you must first assess your infrastructure needs to successfully deploy an electric bus fleet. This tool will help you get started by providing quick and simple guidance on the planning that is required to implement electric charging at your bus depot.

Infrastructure First

In California and throughout the United States, transit fleets are moving towards electrification to reduce emissions, improve efficiency and seek the operational benefits of an electric bus fleet. Though technology has advanced, and fleets are realizing the business case of an electric bus fleet, infrastructure remains to be the biggest barrier to technology adoption. Infrastructure challenges such as deployment lead time, costly upgrades, space constraints, and demand charges are impacting a fleet's ability to effectively own and operate an electric bus fleet. When going electric, infrastructure planning must come first!

Infrastructure Planning Check List

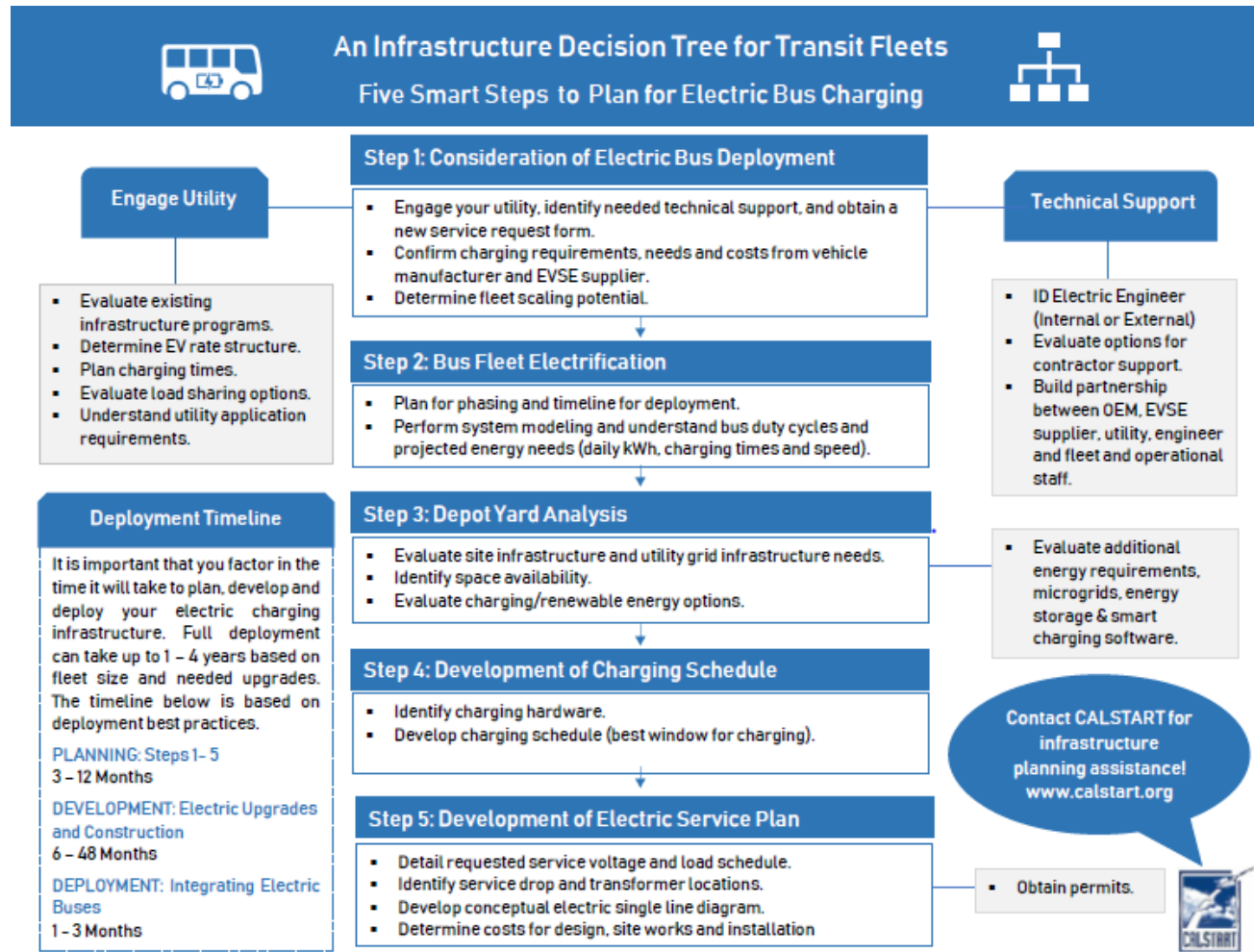
Before you get started with planning your electric charging infrastructure, make sure you are prepared to know the following and soon, you'll be ready to go!

- Fleet Deployment Goals
- Project Team (Internal & External)
- Utility Point of Contact
- Staff Electrical Engineer (or External)
- Estimated Project Timeline
- Capital Budget for Project
- Available Battery Electric Bus Technologies
- Electric Vehicle Supply Equipment Options
- Smart Charging Software & Networking
- Available Incentive Programs
- Permitting Requirements
- Understanding of Contracting Process

Important Considerations to Infrastructure Deployment

Until you have completed the infrastructure planning process, there are number of unknowns that will need to be evaluated to best determine your electric bus fleet deployment plan. For instance, though a transit fleet may initially demonstrate a few electric buses to determine fleet and operational suitability, it is critical to **anticipate potential scaling needs** in case a fleet transitions from 10 to 100 electric buses. Secondly, depending on fleet size, bus technology, charging equipment, access to the grid and power demand, **infrastructure costs can vary** with factors such as required utility upgrades, trenching and laying down conduit, and additional energy storage. Third, **working with your utility** from the onset of the planning process is critical to understand potential build out requirements, cost and development timelines. Lastly, **working with your utility to evaluate electric vehicle rates and potential demand charges** are important to avoid high charging costs while operating an electric bus fleet.

EV Infrastructure Planning Tool for Transit



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- **Moderator: Alycia Gilde**, Director, Fuels & Infrastructure, CALSTART
- **Brian Lee**, Head of Transit Operations, Los Angeles Department of Transportation
- **Jagmeet Khangura**, Microgrid Solutions Lead, Power, Black & Veatch
- **Kimberly Okafor**, Zero Emission Solutions, Trillium





ZOOM TO

ZERO

Discussion Questions:

1. What are the biggest barriers to infrastructure planning, how did you overcome them?
2. What is in your infrastructure planning tool box?
3. What resources are available to support transit fleets with infrastructure planning and development?