

# 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 guidance on the planning required to implement electric charging at your bus depot.

## Infrastructure First

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 the biggest barrier to technology adoption. 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!

## Important Considerations to Infrastructure Deployment

A number of unknowns will need to be evaluated to best determine your electric bus fleet deployment plan.

### Anticipate scaling needs

Though a transit agency may initially demonstrate just a few electric buses to determine fleet and operational suitability, it is critical to anticipate potential scaling needs. Your fleet could grow from 10 to 100 electric buses sooner than you think.

### Infrastructure costs can vary

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.

### Work with your utility

Working with your utility from the onset of the planning process is critical to understand potential build out requirements, cost and development timelines.

### Evaluate electric vehicle rates and potential demand charges

Working with your utility to evaluate electric vehicle rates and potential demand charges is important to avoiding high charging costs while operating an electric bus fleet.

# STEPS TO GET STARTED

1

## CONSIDERATION OF ELECTRIC BUS DEPLOYMENT

- Engage your utility, identify needed technical support, and obtain a new service request form.
- Confirm charging requirements, needs and costs from vehicle manufacturer and EVSE supplier.
- Determine fleet scaling potential.
- Communicate early plans with local utility.

### Engage Utility

- Evaluate existing infrastructure programs.
- Determine EV rate structure.
- Plan charging times.
- Evaluate load sharing options.
- Understand utility application requirements.

### Technical Support

- ID Electric Engineer (Internal or External)
- Evaluate options for contractor support.
- Build partnership between OEM, EVSE supplier, utility, engineer and fleet and operational staff.

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## BUS FLEET ELECTRIFICATION

- Plan for phasing and timeline for deployment.
- Perform system modeling and understand bus duty cycles and projected energy needs (daily kWh, charging times and speed).

### Deployment Timeline

It is important that you factor in the time it will take to plan, develop and deploy your electric charging infrastructure. Full deployment can take up to 1 – 4 years based on fleet size and needed upgrades. The timeline below is based on deployment best practices.

#### PLANNING:

Steps 1- 5  
3 – 12 Months

#### DEVELOPMENT:

Electric Upgrades & Construction  
6 – 48 Months

#### DEPLOYMENT:

Integrating Electric Buses  
1 - 3 Months

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## DEPOT YARD ANALYSIS

- Evaluate site infrastructure and utility grid infrastructure needs.
- Identify space availability.
- Evaluate charging/renewable energy options.

### Evaluate

Evaluate additional energy requirements, microgrids, energy storage & smart charging software.

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## DEVELOPMENT OF CHARGING SCHEDULE

- Identify charging hardware.
- Develop charging schedule (best window for charging).

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## ELECTRIC SERVICE PLAN

- Detail requested service voltage and load schedule.
- Identify service drop and transformer locations.
- Develop conceptual electric single line diagram.
- Determine costs for design, site works and installation

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## BEGIN INSTALLATION PROCESS



# Infrastructure Planning Check List

Before you start planning your charging infrastructure, identify the following needs:

- 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



Contact **CALSTART** for  
infrastructure planning assistance!  
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