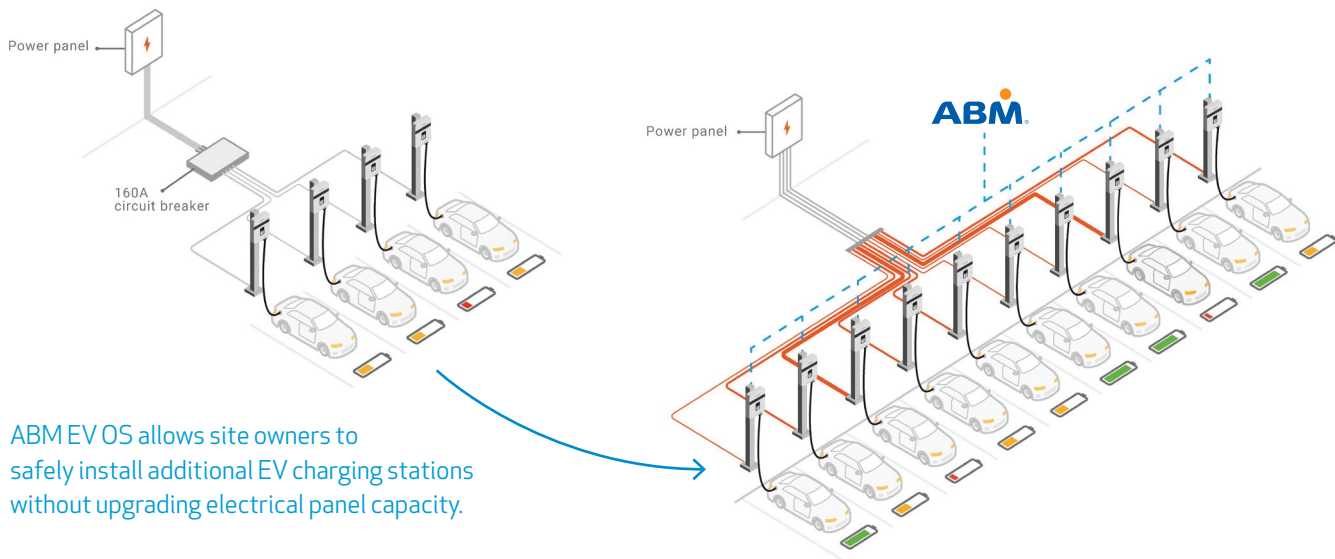


# Load Management

## Overcoming Infrastructure Limitations and Minimizing Costs



### Overview

Increasing the number of charging stations to meet the increasing demands or managing fleet charging, encounters limitations due to the power panel and the electric utility company supply capacity. Launching multiple chargers or adding more chargers at the station requires a big investment in power upgrades and changes in the infrastructure. However, smart solutions, like Load Management Application on ABM EV OS, optimizes energy usage through the smart allocation of power based on the state of charge of each connected vehicle. Thus, it is possible to add more charging stations without any costly major changes.

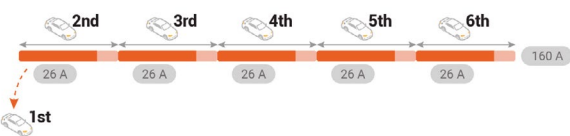
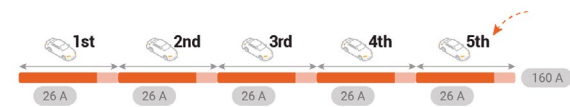
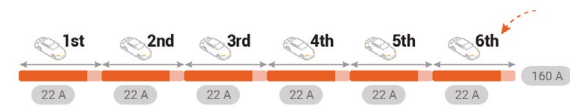
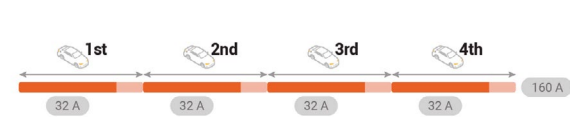
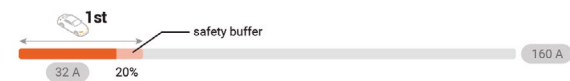
### Key Features

- Utilizes smart algorithms and intelligent monitoring of chargers to balance their electrical. Usage while ensuring that total electrical output stays within a safe range.
- Smart energy allocations to connected chargers eliminate the need for electrical upgrades.
- Doesn't require additional physical wiring for implementation.
- Optimizes the usage of available power from the utility, while protecting the local electrical systems from the dangers of overloading even when multiple chargers are being used simultaneously.
- Offers flexible implementation options to suit your ideal number of chargers.

## How it Works

Load Management dynamically shifts energy to vehicles that need it the most, while constantly monitoring and maintaining the total load under the limit of the electrical panel. For instance, consider a site with breaking capacity of 160 A. This only allows for the installation of four 32 A charging stations. With ABM EV OS Load Management charging station availability increases.

**\*A 32 A charging station needs to have 40 A of power allocated to it in order to satisfy a 20% safety buffer.**



1. When the first EV comes in, it'll be charged with the full power of 32 A.
2. As additional EVs connect, the second EV, the third EV, and the fourth EV, continue to be charged at full power of 32 A. The system at this point is drawing the full available power for charging EVs.
3. The Load Management Application starts to kick in when the fifth EV arrives and five EVs need to charge at the same time. The output for each EV will be calculated and adjusted to uniformly provide a power of 26 A to each vehicle and stay within the limit of the electric panel. As ABM EV OS smart management sends the instructions to the EV chargers, it continues to dynamically monitor the consumption rate of each charger to ensure compliance and makes any necessary adjustments in real-time to make sure every EV is charged at an optimum level while keeping total output under the limit of 160 A.
4. When the sixth EV arrives and six EVs are being charged at the same time, the output to each EV will be calculated again and dropped to 22 A. Load Management Application continues monitoring the consumption and adjusts the output accordingly as more energy becomes available when other chargers complete energy transfer.
5. Specifically, when Load Management Application detects that an EV is fully charged and no longer requires power, for example, when the first EV completes charging and leaves, the energy output will be increased from 22 A to 26 A across the remaining five charging vehicles.