VELOZ®

FACT SHEET

In our ongoing quest to elevate and rapidly accelerate transportation electrification in California, Veloz has evolved its Webinar Series to guide policy education and identify market solutions that will overcome Electric Vehicle (EV) adoption barriers. One of the top barriers is charging infrastructure, which includes public EV charger reliability.

Public EV charger reliability centers on two main concerns: whether a charging station works (*i.e.*, "Is the charger in service?") and how well it works (*i.e.*, "Is the charger working as expected?"). When translated to the driver experience, concern over charging reliability is called "charger anxiety." If left unaddressed, reliability issues will undermine EV acceptance and adoption.

RELIABILITY DEFINED
The general reliability of a charger is defined by a statistic called "uptime," which measures the overall percentage of time that a charging station is operational and available for drivers. For example, 95% uptime translates to two weeks of downtime for a single station. This statistic figured across an entire charging network can create issues for users.

CHARGING PERFORMANCE INDICATORS
Below are key performance indicators that help define downtime, inform uptime and provide important insights into the charging experience.

- **Mean time to repair or "MTTR"** is the time it took for the network operator to detect a problem, the time it took for the network operator to escalate the problem to the party responsible, and the time it took for the party responsible to repair/resolve the problem and restore service.
- **Mean time to restore service or "MTTRS"** is the time it took for the network operator to restore service.
- **Mean time between failures or "MTBF"** can help assess charging equipment performance. Make sure to evaluate based on specific equipment models and versions. This will provide insight into the actual performance of specific equipment over time. All things being equal, a high MTBF should lead to better uptime.

WHAT IMPACTS RELIABILITY?
- An upstream issue with the electrical feed
- A problem with the station hardware
- A problem with the communication network

Some of the causes of these failures may be outside the control of the network operator (like upstream power failures, vandalism, accidents, restricted access to a site and so on), whereas others may be within its control (like equipment or network failures). EV charger infrastructure repair and maintenance is directly related to a positive charging experience.

NETWORKED VS. NON-NETWORKED CHARGERS

Networked charging stations are connected remotely to a larger network and are part of an infrastructure system of connected chargers. Networked chargers have access to online management tools through an online portal known as an EVSE (Electric Vehicle Supply Equipment) network.

In comparison, **non-networked charging stations** are not part of an EVSE network. Non-networked charging stations are stand-alone units that do not access internet systems.

STAKEHOLDERS THAT IMPACT CHARGING RELIABILITY

- **Government agencies** and the legislature, especially:
    - The **California Public Utilities Commission,** which sets and executes standards for utilities and was responsible for changing the rules allowing utilities to own and operate charging stations.
    - The **California Energy Commission**, which is generally responsible for distributing public funds that support the build out of charging infrastructure.
- **Utilities**: In California, **utilities** can directly own and operate charging stations and play a key role in supporting installation by third parties.
- **Carmakers**: Automakers build the vehicles and determine the level and speed that each vehicle model can accept.
- **Electric Vehicle Service Providers (EVSPs)**: An **EVSP** delivers end-to-end EV charging, handling operations and the driver experience. Examples include ElectrifyAmerica, ChargePoint, EVgo, Greenlots, FLO, Tesla (carmaker and EVSP).
- **Site hosts**: A site host could be anyone from a state park ranger station to the owner of a business or shopping mall.
- **Property managers**: A company — often hired by the site host — to maintain not just the charging stations, but often the entire site.

HOW CAN WE ENSURE CHARGING RELIABILITY?

- Include reliability standards in public and utility funding criteria for infrastructure. Public funds should work to achieve a standard of reliability high enough to support the continued adoption of EVs through measurement and transparent reporting.
- Implementing clear redundancy requirements for any public fast charging locations using public funding so that there are multiple fast chargers (above 50kW) charging stations in each location with sufficient connector types should one charging station be broken.
- Networked charging stations, software, and firmware providers should work to integrate their technology with applicable third-party services and automotive companies, ensuring the most up-to-date information as possible for drivers.
- Implement a remote diagnostic tool that can gather hardware error codes. An error code is a critical piece of software automation data that can determine if a work order needs to auto-call a regional contractor for an on-site repair. Alternatively, the software can auto-alert an operations center to handle the issue remotely. Most EV charger issues are typically resolved through remote diagnostics and a remote restart.