US proposes minimum standards for EV chargers

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IHS Markit perspective

Implications	The US has proposed minimum standards for federally funded EV chargers, to create a cohesive, transparent, and interoperable system, under the authority of the US Department of Transportation (DOT) and the Federal Highway Administration (FHWA).
Outlook	The proposed rules on minimum standards would apply specifically to federally funded projects, which means that private companies and state or local public programmes not receiving government funding could still deploy chargers that were not consistent with these standards. However, the US government has targeted funding 500,000 chargers across the country by 2030 and, therefore, this has created a significant incentive for compliance with the proposed minimum standards. Although the final form of the rules may change depending on feedback and comments from the public, the drafting of the proposed rules is a significant step forward. Creating a common set of standards will be crucial in developing a charging network to enable the large-scale adoption of EVs that is targeted by the government.

The US Department of Transportation (DOT) has proposed minimum standards for federally funded chargers of electric vehicles (EVs), to create a cohesive, transparent, and interoperable system. The standards would apply under the authority of the DOT and the Federal Highway Administration (FHWA).

In November 2021, US President Joe Biden's administration announced a new USD1-trillion infrastructure bill, which includes USD7.5-billion funding for the creation of a national EV charging network. The authorities' proposed rule announced on 9 June would introduce minimum standards for federally funded EV chargers and thereby drive the creation of a network of chargers relatively easy for consumers to use across locations and vehicle types (see **United States: 8 November 2021: US lawmakers approve USD7.5-bil. EV charging network investment**). The funding for the charging network is to be distributed through a National Electric Vehicle Infrastructure (NEVI) formula programme. Whether the funding is through a local or federal programme, if the funding is from the NEVI (including through state or locally operated programmes funded by NEVI), the charging stations would be required to comply with the federal authorities' final rule. A specific date for the issuance of the final rule is not yet available. The final rule is to be determined after a mandatory 60-day period of public consultation and after the comments are reviewed and the FHWA makes any changes to the proposed standards that it deems appropriate.

The proposed rule states that the NEVI programme recommends EV charging stations should be no more than 50 miles apart and along designated "alternative fuel corridors". According to the proposal, the standards would apply to the installation, operation, and maintenance of EV charging infrastructure. The standards would require interoperability of EV charging infrastructure, as well as traffic control devices on on-premises signage acquired, installed, or operated in concert with EV charging infrastructure. The proposals also include standards on data (including format and schedules for submitting data); network connectivity of the infrastructure; and information on publicly available EV charging infrastructure locations, pricing, real-time availability, and accessibility through mapping applications. Currently, private EV charging companies are working on solutions for each of these elements, but until now, the lack of a common set of minimum standards means there have been a myriad of solutions and little consistency for consumers looking for a charging station. The FHWA says the proposals do not address some elements of charging infrastructure and that standards on these can be determined later. These include a minimum standard on vehicle size and accessibility to chargers.

The full proposals are available on the FHWA's website, and this article reviews several elements of the proposals. The proposals recommend that NEVI-funded programmes use only DC fast chargers (DCFC) capable of delivering a charge of 150 kW or above and that each charging station has a minimum of four charging ports. The proposals set a minimum standard on minimum annual uptime of more than 97% based on a formula provided in the rule. The FHWA proposes that states ensure data on real-time charging station status is provided free to third-party mapping applications. The

proposals state that the opportunity remains for AC chargers and charging stations with fewer than four charging ports, if funded through non-NEVI funds, whether public or private. Additionally, NEVI-funded projects could install Level 2 AC chargers in addition if the minimum for DCFC chargers was met. These AC chargers would be required to deliver at least 6 kW and use a Society of Automotive Engineers (SAE) J1772 connector. The proposals recommend that the DCFC stations use Combined Charging System (CCS) ports, and state that the expectation is that with either the current vehicle charge ports or the use of adaptors, these could service all EVs. The FHWA is requesting public comments on potential standards for wireless or overhead charging solutions. The charging stations would be required to be available for use 24 hours a day, seven days a week, all year round, with "minor exceptions". The proposals also address the creation of a consistent payment experience for consumers across the country. The proposals would require that the system was secure, equitable, accessible, and flexible enough to enable compatibility with future innovations in payment methods. The proposals would require plug and charge payment, as well as options for contactless payment methods that accept all major debit and credit cards, as well as that services could not be restricted by membership or payment method type. The proposals would also require a method like a prepaid card be usable. Relative to security, the proposals would require states to implement physical and cybersecurity strategies, including issues like lighting, driver and vehicle safety, fire prevention, tampering, illegal surveillance of payment devices and other elements. There would be further requirements related to training and certification of the people to install and maintain the chargers, and requirements for systems for customers to report outages or other issues with the infrastructure. The proposals include use of ISO 15118 international standards for EV-to-charger communications. However, the authorities request feedback on whether a performance-based standard would be preferable to the ISO protocol. The proposals also include minimum standards for charging network connectivity, including charging network communication, charging network-to-charging network communication, and charging network-to-grid communication, including proposing the use of Open Charge Point Protocol, an industry standard designed to work with ISO 15118. The proposals would also require that chargers be capable of secure communication with electric utilities, other energy providers or local energy management systems. In addition, the proposals address minimum standards relative to information on location, pricing, real-time availability and accessibility through a mapping system. Chargers would be required to display and base the cost for electrical charge in US dollars per kilowatt-hour (kWh). However, the FHWA requests comments on how to display the cost in states where pricing based on US dollars per kWh is not allowed. Further requirements would address displaying of pricing structure, including whether the provider imposes dwell-time or other additional fees. The authorities request public comments on the question of whether additional fees should be allowed or encouraged.

In addition, the US president has announced a 25-member EV Working Group, to be selected later this year, tasked with making recommendations on the development, adoption, and integration of EVs in the US.

Outlook and implications

The proposed rule on minimum standards would apply specifically to federally funded projects, which means that private companies and state or local public programmes not receiving government funding could still deploy chargers that were not consistent with these standards. However, the US government has targeted funding 500,000 chargers across the country by 2030 and, therefore, this has created a significant incentive for compliance with the proposed minimum standards. Although the final form of the rules may change depending on feedback and comments from the public, the drafting of the proposed rules is a significant step forward. Creating a common set of standards will be crucial in developing a charging network to enable the large-scale adoption of EVs that is targeted by the government.

The proposal is due to be published in the US Federal Register in the next week, which starts a 60-day public comment period. EV adoption should improve significantly if consumers have trust that they can find a charger when and where they need one, that their car can connect to the charger, and that the pricing of the charging session will be transparent. With the current patchwork of charging solutions, consumers have anxiety over how reliable and easy charging is for longer trips or for emergency situations – such concerns are at the core of range anxiety. Longer range of charge gives consumers confidence they can drive further between charging sessions, but range anxiety is also based on the inconsistency in today's charging solutions, as well on the number of miles travelled. Creating a set of minimum standards for EV chargers would help in making progress on such issues. However, the proposals do not address the risk of potential costs of developing the various systems required to be compliant with the standards.

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