

PUBLIC EV DEPLOYMENT GUIDE *Electrify New Mexico*





We will make mistakes, and we need your feedback and assistance. We want to hear from you! Please scan the QR code and take our brief survey.

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The future is now!



"This Deployment Guide is aimed specifically at public entities looking to build electric vehicle charging stations. Whether you work for a state agency, a county, or a municipality, our intent is to simplify the process and to assist you in deciding what best suits your needs and finances." —Michelle Lujan Grisham, Governor

Electric vehicles will soon be a major part of how we travel in New Mexico and across the United States. We want to be ready. As the price of electric vehicles drops dramatically and more New Mexicans choose to drive them, New Mexico is building out our charging network to meet the demand. This Deployment Guide is aimed specifically at public entities looking to build electric vehicle charging stations. Whether you work for a state agency, a county, or a municipality, our intent is to simplify the process and to assist you in deciding what best suits your needs and finances. This guide will be followed by a similar one directed at the commercial sector (including malls, hotels, multi-family housing) and one designed for residential EV charging. We anticipate that as technologies and practices progress, so too must these guides. We want to hear from you what's working and what's not, so that we can make sure we're delivering the very best tools to assist you in the great transition to a cleaner and healthier New Mexico. The future is now!

Michelle Lujan Grisham, Governor The State of New Mexico





Purpose & Vision

According to the International Energy Agency's best practices, there should be one public electric vehicle charging port for every 10 electric vehicles, with a ratio of three Level Tvwo chargers for every one DC fast charger.



Purpose

The State of New Mexico is dedicated to serving its customers and the public by supporting the build out of a foundational network of electric vehicle (EV) charging stations along the major New Mexico travel corridors and has a demonstrated willingness to deliver EV charging stations, to support electrification needs while allowing further access to the public, and to serve charging infrastructure needed to increase market penetration of zero-emission vehicles. The elements in this deployment guide will constitute a leap forward in achieving that low-carbon future. New Mexico has a vision for EV adoption across all areas of the State. To support the continued growth of EVs, there is a crucial need for expanded public fast charging stations. New Mexico also recognizes that delivering on the vision of an EV future will require not just building charging stations, but also ensuring a positive charging experience for all customers in all areas.

Vision

EV charging infrastructure should be widely available where drivers are currently parking their EV, whether at home, at work, or at public locations. Although these





charging opportunities can meet most drivers' daily charging needs, it is a critical step to giving EV drivers confidence to travel longer distances and enabling more drivers to switch to driving an EV. Drivers should expect that they will always be able to charge their vehicles at a public EV fast charging station. Increasing the number of EV fast charging ports will not lead to increased EV adoption if they are unreliable or difficult to operate.

This requires both a proactive and reactive approach to maintenance, reliability, and accessibility of public EV charging infrastructure.

Drivers must feel confident that they are able to use charging infrastructure safely and securely. There should be no surprises in a driver's charging experience. As you read through the deployment guide, please keep in mind that deployment and maintenance costs are higher in rural, low-utilization areas, and infrastructure has not been updated recently or as frequently as urbanized areas. Recognizing that some communities may have limited electrical capacity where infrastructure, appropriate upgrades have to be installed. These challenges in rural areas must be recognized and accounted for in the scope of work.

Best Practices

Planning, design, and deployment of EV charging



Best Practices

EV charging infrastructure installations are an essential precursor to EV adoption because a robust network of Electric Vehicle Supply Equipment (EVSE) builds consumer confidence that drivers will be able to charge their vehicles conveniently and affordably. Without sufficient EVSE deployment, it will be challenging to achieve New Mexico's Advanced Clean Cars and statutory goals for EV adoption. To ensure EVSE deployments are well-designed and optimally located, a number of considerations must be taken into account, including local planning and permitting decisions, business model and site design options, engagement with the local electric utility, and prioritizing equitable access to EVSE.

Business models and site design

Selecting a viable business model and designing the specifics of an

EVSE deployment are closely related topics that jointly define the overall approach to providing charging at a given location. While many variations exist, there are three primary business models:

- The network—owned and operated model. EVSE network providers develop and own EV charging stations; evaluate, select sites and negotiate with site hosts; and work directly with utilities and jurisdictions on permitting and process developments. Site hosts may have little or no control over the site development, pricing, operations, or customer service, but also have lower risk.
- The site host owner-operator model. Site hosts procure EVSE from a hardware manufacturer, work with contractors to install the equipment, and then directly operate the EVSE. Site hosts retain

control of site development, operation, pricing and revenue collection, and customer service, while also taking on the corresponding risks.

The third-party owner-operator model. Third parties, such as local retail outlets, typically develop the site (working with iurisdictions and electric utilities on permitting, code, and process requirements); determine prices and revenue sharing; and provide ongoing operation, maintenance, and customer service. Third parties often lease space from site hosts and may share a portion of revenues collected. Third parties take on much of the project risk while site hosts lose control over some aspects of the deployment (e.g., customer experience and full revenue collection).

Projected EV Charging Requirements

• How many charging ports of different types are required to meet expected local demands?

Understanding Community Needs

- What are the community's priorities for EV charging?
- Which locations are most important?
- Who needs to be involved?

Supporting Resources and Funding Pathways

- What programs are available to provide funding for EVSE?
- Where can incremental funding be sourced from?

Strategic Planning and Prioritization

• Considering options and priorities, how will the jurisdiction begin implementation?

Phased Deployment of EVE

EV procurement considerations





This identifies the primary components of this infrastructure, including electric utility equipment such as the distribution network, step-down transformers, and the electricity meter, as well as customer equipment including electric panels, circuitry, and wiring at the site.

In addition to cost, prospective site hosts must consider the level of control they desire and how involved they care to be in operating the EVSE when determining which approach will best suit their needs.

Regardless of the business model chosen, a clear operations and maintenance plan should be put in place with targets for reliability, and should include a provision for a 24/7 customer service phone number for users to troubleshoot charging, payment, or other issues. This strategy and related best practices help to ensure EVSEs are reliable and accessible.

Utility engagement

Local electric utilities are essential partners in supporting EV and

EVSEs. They must be engaged early and often throughout the development of EVSE sites. Site hosts and project developers must work with utilities to ensure the existing electrical system can support the proposed EV charger and plan for any necessary service upgrades.

Utilities are responsible for delivering the electricity to power chargers and developing and maintaining the electric grid, including the service connection to individual sites. Utilities and/or their regulators set electricity rates, determining site hosts' costs for operating the chargers. In some cases, utilities are the owners and operators of EVSE stations themselves. The more information site hosts and project developers can provide to utilities early in development, the better. Local governments, site hosts, and EVSE developers will want to work with the local utility to understand their processes and available financial incentives.

EV chargers are only one component of the broader utility infrastructure needed to meet EV driver demand and support our transportation electrification goals. The graphic above identifies the primary components of this infrastructure, including electric utility equipment such as the distribution network, step-down transformers, and the electricity meter, as well as customer equipment including electric



Sharing your project plans early can also help your local utility complete the permitting applications required by many jurisdictions. As illustrated in above, typical permitting information includes: site plans; Expected number and power level of EVSE; electric panel size (to include possible future proofing) and service voltage/ phase; single line diagrams; and anticipated new electrical load.

panels, circuitry, and wiring at the site. These components are required to support the connection to the EV charger and to deliver electricity for charging vehicles. Depending on the site, these components may already exist or may need to be installed before the charger is operational.

Project developers must work directly with the local utility to ensure that proposed chargers can be accommodated by the site's existing electric service capacity or upgraded. Engaging with the utility early in the project is critical to ensuring realistic timelines and project plans, since interconnection and service upgrade processes may be time-consuming. Site hosts and developers should, early on, identify the right point of contact at the local utility and the overall process for interconnection or service upgrades.

Sharing your project plans early can also help your local utility complete the permitting applications required by many jurisdictions. As illustrated above, typical permitting information includes:

- Site plans
- Expected number and power level of EVSE
- Electric panel size (to include possible future proofing) and service voltage/phase
- Single line diagrams
- Anticipated new electrical load

Suppose the site host plans to install a small number of EV chargers with an expansion planned down the road. In that case, it is essential to share these plans with the utility to future-proof the investments in electrical infrastructure. It is more cost-effective to put larger electric service capacity in at the outset rather than to re-do electrical work several years later when additional chargers are deployed.



Description of a typical network boundary. Electricity rates vary depending on the utility and rate class available to the site owner and operator. For example, some utilities may offer an EV charging rate or a lower rate for charging off-peak. For most customers, there are three components to an electricity rate to consider.

Installation

When thinking about installation, the requirements concerning charge point placement are as key as having access to sufficient electrical supply. As such, there are two types of installation contractors that may need to be engaged: one that holds expertise on electrical activities behind the meter, namely the private side of the network boundary; and one proficient in conducting in-frontof-the-meter electrical activities. i.e., the public side of the network boundary. The network boundary is typically formed by the gate meter or the metering point on site, as per the illustration above. The components leading up to the meter can be modified by most qualified electricians. However, beyond this point requires

a case-by-case examination, as the regulations and processes for carrying out works vary.

Assessing the network capacity limits, increasing the electrical capacity of your site, or maximizing the physical capacity without complex upgrades beyond the boundary of the site are multi-faceted. Adopt a comprehensive view of your existing electrical infrastructure and recognize multiple methods and locations at which upgrades can occur, including the sub-distribution board, the main switchboard, the consumer supply mains, or the site transformer.

Beyond grid considerations, there are other requirements and considerations to account for during the installation, even once the location has been chosen. Other considerations that may enhance the ease of charging and maintenance may include optimizing the socket outlet height, impact protection, direction or bay signage, and free space around the charging station.

Electricity costs

Electricity rates vary depending on the utility and rate class available to the site owner and operator. For example, some utilities may offer an EV charging rate or a lower rate for charging off-peak. For most customers, there are three components to an electricity rate to consider:

• Basic charge (\$/month): a fixed amount that does not vary month-to-month. These charges are the minimum

service cost regardless of the energy used. The base charge aims to recover the utility's fixed, customer-specific costs, such as the electrical meter, billing, and customer service.

- Energy charges (\$/kWh): assessed per unit of energy based on the volume of energy consumed. The energy price (\$/kWh) will vary by type of customer (e.g., residential, commercial, or industrial) and, in some cases, by time of day.
- Demand charges (\$/kW): assessed based on the maximum volume of kWh consumed in any specified interval (typically 15 minutes) during the billing cycle. Demand charges usually apply to commercial and industrial customers. Rate structures may include different demand rates during different times, such as peak and off-peak hours. These charges are intended to recover the utility's costs of operating the electric grid. Demand charges can comprise a significant portion of commercial customers' electricity bills. Utility-sponsored managed charging and pairing charging stations with technologies such as solar photo-voltaic (PV) and storage can help reduce demand charges by avoiding peak charging above a certain level.

Ensuring equitable access to EV charging

EV chargers should support community-defined charging goals, and everyone should have access. Early and frequent engagement is key, including the following strategies:

• Conduct community or mobility needs assessments.

- Conduct education and outreach campaigns centered around understanding underserved community needs.
- Develop accessible public charging in the right-of-way.
- Provide focused incentives and financing options for lower-income residents.

There are also crucial questions to ensure equitable charger development, including:

- What groups should be included in planning discussions and throughout project implementation?
- What types of charging are most important to each user type?
- Which areas are most vulnerable to insufficient attention and investment?
- What unintended impacts might arise, and how can they be prevented? Careful attention to inclusion and equity in the planning and deployment processes is critical to establishing an EVE landscape that meets the needs of all New Mexicans.
- ٠ Developers and site hosts may consider designing EVE stations to include 110V outlets for electric micro mobility options such as e-bikes, e-scooters, and electric wheelchairs. Providing this additional feature entails a minimal incremental cost and can make the charging station a much more valuable and utilized asset. Particular locations that should be prioritized for inclusion of 110V outlets include those near bicycle facilities, scenic bike routes, and areas with dense bicycle infrastructure, as well as those near tourist destinations and transit connections.

Accessibility

The State of New Mexico aims to support charging by all drivers. The U.S. Access Board provides design recommendations for making EV charging compliant with the Americans with Disabilities Act (ADA). Site design should incorporate accessible mobility features such as a physical layout to accommodate wheelchairs, walkers, or other mobility devices. Charging connectors and payment mechanisms must be placed at a height that enables comfortable access for those in wheelchairs. Chargers should also be outfitted with accessible communication features, including options for deaf users or those who are hard of hearing.

Best practices suggest DC fast chargers should have at least one ADA compliant space and for Level 2 chargers, at least 10% should be ADA compliant.



https://afdc.energy.gov/files/u/ publication/WPCC_complyingwithADArequirements_1114.pdf

EVCHARGER

When evaluating potential locations for EV chargers, a variety of site characteristics must be taken into consideration to give your project the greatest chance of success. Careful evaluation of potential EV charger locations and use cases is necessary to ensure your project adds value to the community.

Placement of EV charger

Level 2 and Level 3 electric vehicle chargers are the most commonly used EV charging technologies. Level 2 chargers operate at the same 240 volts used by large household electrical appliances (dryer/range/water heater), offering increased efficiency and significantly improved charging times. With a power output ranging from 7 to 19.2 kilowatts, Level 2 chargers are well-suited for charging at home, workplace, and other public locations. The relatively low cost and ability of Level 2 chargers to fully charge EVs within a few hours make them ideal for daily use in both commercial and residential settings.

Level 3, also known as DC fast chargers or DCFCs, represent the pinnacle of EV charging speed and efficiency. These chargers operate at much higher voltage levels, typically ranging from 200 to 600

volts. The power output of Level 3 chargers surpasses that of Level 2, with a minimum output of at least 50 kilowatts, while reaching up to 350 kilowatts or more in the most advanced systems. This higher power output allows Level 3 chargers to deliver rapid charging, significantly reducing the time required to replenish an "electric vehicle's battery." In some cases, Level 3 chargers can provide an 80% charge in as little as 20 minutes, making them essential for long-distance travel. While crucial for widespread EV adoption, Level 3 chargers are much more expensive and can degrade battery life faster than their Level 2 counterparts. They also require additional siting considerations and coordination with electric utilities due to their substantial power requirements.

When evaluating potential locations for EV chargers, a variety of site characteristics must be taken into consideration to give your project the greatest chance of success. Careful evaluation of potential EV charger locations and use cases is necessary to ensure your project adds value to the community. Each jurisdiction may have unique objectives and constraints to inform ideal EVSE sites, and a thorough analysis of the following characteristics will ensure you choose the best available location for your community's unique EV charging needs.

• Intended Use Case: Analyze your community's anticipated EV charging needs and match up to the amenities available from the site host. For example, your community may be interested in providing EV charging to tourists and/ or travelers. In this instance, it may be beneficial to locate a DCFC to accommodate travelers. A bank of Level 2 chargers located at an area Explore partnerships with businesses or local entities willing to host charging stations and match the level of charging with the anticipated amenities. For example, a hotel may benefit from a bank of Level 2 chargers as opposed to a single DCFC, especially as the hotel intends the infrastructure to attract lodgers to stay overnight.



hotel or shopping center can serve tourists who intend to stay in the area. It is important to match the amenity with the level of charging; for instance, a hotel that installs a DCFC may attract travelers who wish to charge quickly and continue their journey. Pairing a hotel—which expects customers to stay overnight with a bank of Level 2 chargers will better leverage the charging technology and the needs of the site host.

- Traffic and Visibility: Analyze local traffic patterns, identifying areas with high demand for charging services. Choose locations with high car traffic or visibility from main roads to maximize usage.
- Parking Availability and Accessibility: Ensure sufficient space for dedicated EV charging spots and easy

access for EV drivers with a well-marked path and clear signage. Pull-through charging spots will enable access for larger vehicles and those pulling trailers.

- Nearby Amenities and Charging Need: Proximity to amenities like shops, restaurants, restrooms, and lodging can enhance the overall charging experience. Explore partnerships with businesses or local entities willing to host charging stations and match the level of charging with the anticipated amenities. In contrast, a gas station may benefit from a DCFC but will see less utilization from a bank of Level 2 chargers.
- Grid Connection and Capacity: Talk to your local electric utility. They can help you evaluate the cost and feasibility of connecting

to the local power grid and assess nearby electrical infrastructure to ensure it can support the required charging equipment without extensive infrastructure upgrades. If you're flexible on the charger location, they may even be able to suggest a location with cheaper infrastructure upgrade needs that can significantly lower the cost of construction.

- Safety and Security: Choose sites with good lighting and consider safety and security measures for users.
- Cyber Security: Always include requirements for the latest affordable cyber security technology.



All signs should conform to state and/or local requirements regarding visibility, legibility, size, shape, color, and reflectivity. The NMDOT adopted a standardized symbol to identify publicly accessible electric vehicle charging stations along major roadways.

Signage

Providing clear signage indicating the location of EVSE stations is essential for ensuring that drivers can find and use this infrastructure. EVE signage can also help prevent accidental blocking of EV charging spaces by vehicles that are not plugged in and charging. Additionally, developing clear and consistent signage helps to promote awareness of EVE options and increases interest in driving an electric car. Signage and markings should be located and mounted for good visibility. All signs should conform to state and/or local requirements regarding visibility, legibility, size, shape, color, and reflectivity. The NMDOT adopted a standardized symbol to identify publicly accessible electric vehicle charging stations along major roadways which is showed above.

For all signage being erected on NMDOT Right of Way (RoW), an NMDOT Work Permit will be required prior to sign placement. The NMDOT District Office must be contacted to request a Work Permit Application which must be submitted directly to the District Traffic Engineer. All supporting documentation is required when submitting. Included with the application packet will be a Memorandum of Agreement (MoA) clearly stating who is assuming responsibility for maintenance and eventual replacement, including sign installation details, i.e., where the signs will be located, what specifications will be followed for installation (height, post type, breakaway design, distance from edge of travel lane, etc.).













Pricing

Payment methods, Security, Cyber Security, Planning level cost estimates, Types of Federal Funding and Financing Programs, State and Local Funding programs

It is best practice for public charging sites to offer \$/kWh pricing that is set fairly and communicated transparently prior to customer use, with any fees for parking, non-member use of EVSE, or other non-energy costs to also be clearly displayed for consumers up front.

Pricing

As discussed throughout this document, EV charging infrastructure can be a benefit for your organization, employees, and customers. EV chargers also represent an additional and ongoing cost in electricity, operations, and maintenance. Setting an appropriate end-user price for the use of the EVSE can ensure it is appropriately supported without being an additional burden on facility operations and maintenance budgets. Below are a few general guidelines for kilowatt hour pricing. When determining the most appropriate price for the use of your EV charger, it is important to estimate the expected electrical costs your organization will incur through the use of the EVSE.

Pricing for EV charging can take several forms, with three general strategies:

- 1. Providing free charging as an amenity;
- 2. Charging a nominal fee to cover the operating and/ or capital costs; or
- 3. Pricing electricity to earn a profit margin. Additionally, site hosts must choose whether any other fees will be assessed, including membership fees for using the charging network or "dwell-time" fees which disincentivize leaving cars parked beyond the necessary charging time. The appropriate pricing choice for a given site host will depend on the motivation for installing EV charging, the business model selected, and the costs the site host and/ or third party provider has incurred. If a third-party is involved, site hosts will need to also work with them to establish any revenue sharing arrangements (typically in exchange for the third party's use of the site to install EVSE).

Public EV charging best practices include providing clear and advance communication of pricing to customers using the standard approach of a \$/ kilowatt-hour (\$/ kWh) rate. EV batteries are rated in terms of the amount of energy

they can store and expressed in kWh (e.g., a 60–or an 80-kWh battery), in the same way that a conventional vehicle might have a 15-or 20-gallon tank. Pricing in \$/kWh therefore conveys how much it will cost per unit of energy purchased, just as \$/gallon pricing does for gasoline or diesel. At times pricing is alternatively communicated as \$/minute or \$/mile, but these approaches don't convey how much energy is actually being transferred and are not considered best practice. Pricing in \$/minute doesn't convey how many kWh are dispensed per minute, while \$/ mile prices are inherently flawed because different EV models use different amounts of energy (kWh) per mile in the same way that a conventional sedan generally gets more miles per gallon of gasoline than a pickup truck or SUV. It is best practice for public charging sites to offer \$/kWh pricing that is set fairly and communicated transparently prior to customer use, with any fees for parking, non-member use of EVSE. or other non-energy costs to also be clearly displayed for consumers up front.

Many utilities will incorporate different types of charges, the two most common of which are energy consumption charges and energy demand charges. Energy consumption charges will typically be levied on a \$ per kWh basis; demand charges will be based on the maximum amount of energy used, and they will typically be represented as a \$ per kW. To better understand how these costs are calculated, it is important to talk with your electric utility about how the electric pricing for your facility is determined.



Price formula for a newly installed EVE (Total Electric Bill / Estimated Number of kWh to be Consumed) *Margin [150%] =

Minimum Cost per kWh for end-user

Many utilities will incorporate different types of charges, the two most common of which are energy consumption charges and energy demand charges. Energy consumption charges will typically be levied on a \$ per kWh basis; demand charges will be based on the maximum amount of energy used, and they will typically be represented as a \$ per kW. To better understand how these costs are calculated, it is important to talk with your electric utility about how the electric pricing for your facility is determined. Your electric utility representative can help you understand how energy pricing works for your facility and, with a few estimates, can help you understand how an EV charger may affect your electric costs.

One way to determine the most appropriate price for the use of your newly installed EVSE is to estimate the total electric bill (update this as actual electric bills are received), divide by the estimated number of kWhs expected to be consumed (update this metric as actual electric bills are received), then multiply by a margin to ensure your organization is collecting enough revenue through the EV charger's use to fund a mortization of capital cost (development, installation, and equipment), operation and maintenance costs; a reasonable starting margin might be 50% (update this at least annually based on actual operations and maintenance costs are incurred).

(Total Electric Bill / Estimated Number of kWh to be Consumed) *Margin [150%] = Minimum Cost per kWh for end-user

To provide an example, let us assume your organization is installing a DC Fast Charger, your estimated total electric costs for a month are \$16,468, and you forecast the charger to dispense 50,000 kWh. Your starting end-user price might be calculated as follows: (\$16,468 / 50,000 kWh) X 150% (Margin) = \$.4940 per kWh.

Payment Methods

In addition to pricing decisions, site hosts and/or EV charging providers who are not providing charging as a free amenity must determine what payment methods

EV Payment Methods



will be accepted, examples of which include credit cards (both chip-enabled and contact-less options), mobile app-based payments, and QR codes. EVSE vendors and EV charging service providers can help determine the best payment options for a given site deployment, based on anticipated user base and usage patterns. Best practice is to provide multiple options so that the EVSE is available to the broadest range of potential users. Project planners will want to ensure that payment method choices don't restrict access for some potential user groups such as the unbanked or drivers without smartphones. Planners and prospective site hosts should also be aware that any EVSE receiving public funding

and/or utility incentives may be required to adhere to specific standards for payment methods. These standards are intended to ensure convenient access for diverse groups and compliance is not typically onerous. Charging stations should be accessible by all drivers independent of network memberships or subscriptions: a 24/7 customer service line should be available for users to resolve charging questions and enable payment over the phone; and stations should accept more than one form of payment, including a form of debit and credit card as well as a mobile payment option.

By collecting these monies from those who use the EV chargers, your organization will collect enough funds to pay for any energy consumed and will begin building a fund for operations and maintenance costs. Organizations are encouraged to routinely update these rates based on real energy, operations, and maintenance costs incurred to ensure adequate financial support for your infrastructure; a quarterly or monthly price update can reduce the likelihood your newly installed EV charger becomes a burden on your organization's budget.



Ensuring that a 24/7 customer service number is available at the site benefits drivers from a security perspective in addition to offering good customer service and the opportunity to pay for charging by phone if other payment mechanisms are down.

Security

Site design must also consider appropriate security measures, both to ensure drivers remain safe and to discourage vandalism. Basic security features include appropriate lighting-which should be functional during all hours—as well as EVE deployments designed to be tamper-resistant and robust enough to avoid damage from would-be vandals. Where feasible, developers and/or site hosts may wish to also consider how EVE can be sited to be closer to foot traffic such as near store entrances and frequently used pathways, and avoid tucking chargers in remote corners of parking lots and garages. Additional security features such as video cameras may also prove beneficial for some deployment types. Ensuring that a 24/7 customer

service number is available at the site benefits drivers from a security perspective in addition to offering good customer service and the opportunity to pay for charging by phone if other payment mechanisms are down.

Cyber Security

Ensuring cybersecurity and integrity of EVSE infrastructure is also of paramount importance, with two main areas of concern:

- 1. securing user physical safety and personal information; and
- 2. protecting operational integrity and connected infrastructure. While charging technology and the cybersecurity systems that protect them are evolving quickly there are some foundational cybersecurity principles and techniques that public charging infrastructure should adopt.

The State of New Mexico is committed to ensuring that critical infrastructure transportation technologies of the future, including EV charging networks, do not pose a cyber security or personal property risk to the State of New Mexico or the United States. Third parties will own, operate, protect, and maintain the EV charging stations as well as the data produced. They may be required to provide State of New Mexico anonymized data on a recurring basis. Third parties may also be required to publish station location, power ratings, and cost to the various tracking sites for the EV charging station locations, including the US Department of Energy Alternative Fuel Data Center.

The State of New Mexico is committed to ensuring that critical infrastructure transportation technologies of the future, including EV charging networks, do not pose a cybersecurity or personal property risk to the State of New Mexico or the United States.

Example estimate to install two ChargerPoint/Greenlots

Item	Estimated Cost
EV Charging Equipment	
Two ChargerPoint/Greenlots dual-port networked chargers (four total charging ports)	\$15,000
EV Charging Equipment	
Permits	\$400
Trenching/boring materials and labor	\$5,000
Electrical conduit materials and labor	\$3,400
Poured foundation parts and labor	\$2,000
Electrical system upgrades (e.g. panel circuitry, meter)	\$5,000
Landscaping, signage, striping	\$500
Total	\$31,300



...it is critical to consider all four cost categories in planning. You may wish to consult with the local electric utility and the authority having jurisdiction (e.g., county or city) early and often during EVE planning to better assess costs due to electrical upgrades or other soft costs.

Planning level cost estimates

When planning for EVSE deployments, estimating all the costs can be challenging. Four cost categories are important to consider:

- Equipment;
- Installation (including the customer side of the meter electrical connection costs);
- Electrical upgrades on the utility side of the meter (such as transformers);
- Soft costs (such as site acquisition, permits, easements, environmental review, and other processes).

The other two categories of cost—electrical upgrades and soft costs—are highly variable and site-specific. These are not discussed at length in this guidebook. Nevertheless, it is critical to consider all four cost categories in planning. You may wish to consult with the local electric utility and the authority having jurisdiction (e.g., county or city) early and often during EVE planning to better assess costs due to electrical upgrades or other soft costs.

Types of federal funding and financing programs

Program Type	Description
Discretionary Grant Funding Programs	For discretionary grant programs, an agency solicits applications and competitively selects projects based on eligibility, evaluation criteria, and departmental or program priorities. Most programs described in this toolkit are discretionary grant programs.
Formula Grant Funding Programs	Formula grant programs apportion funding based on formula in statute. The recipients of these funds can be States, federally recognized Tribal recipients, cities and counties, or transit agencies. Recipients are responsible for determining how the funds are used according to program guidelines. Entities that do not receive formula funding directly (e.g.), nonprofits or transportation providers) may be eligible to receive formula funding from agencies that initially receive the formula grants; this toolkit refers to these entities as "ultimate recipients."
Loan Financing Programs	Credit assistance programs leverage Federal funds to accelerate project delivery when direct funding programs are not readily available or applicable. Public credit assistance programs may also attract private and other non-Federal co-investment for projects. This can take the form of secured (direct) loans, loan grantees, and lines of credit.
Tax Incentives (e.g., credits, exemptions, deductions)	The U.S. tax code contains potential funding sources for individuals, non-governmental organizations, and private organizations in the form of tax incentives. Specifically, exemptions, exclusions, and deductions all reduce an entity's taxable income, while credits, preferential tax rates, and deferrals decrease tax liability or even generate cash payments to the taxpayer. The Internal Revenue (IRS) is responsible for administering these policies.



Overview of EV Federal Funding and Financing Programs

https://www.transportation.gov/rural/ev/ toolkit/ev-infrastructure-funding-and-financing/overview_



Grants.gov https://grants. gov/



Electricity Laws in New Mexico

https://afdc. energy.gov/ fuels/laws/ ELEC?state=NM

State and Local Funding Programs

In addition to the federal funding and rebate programs, there may also be state and local government funding available that convenience stores and truck stops can take advantage of. Some programs will pay for make-ready infrastructure, which helps businesses future-proof their properties and save money during later expansions, while others exclusively pay for the charging stations themselves. We highly encourage state agencies and local governments to incorporate funding of EV charging stations, to include EV fleet vehicles, into their legislative budgetary requests.

What kind of charger is right for your community?

Level 1

• Operate at the standard 120 volts found in standard household electrical outlets. Not recommended for government charging stations.

Level 2

- Operate at the same 240 volts used by large household electrical appliances (dryer/ range/water heater).
- Power output ranging from 7 to 19.2 kilowatts.
- Relatively low cost.
- Ability to fully charge EV within a few hours make them ideal for daily use, in both commercial and residential settings.

Level 3

• Also known as DC fast chargers (DCFCs) and represent the pinnacle of EV charging speed and efficiency.

- Operate at much higher voltage levels, typically ranging from 400 to 1,000 volts.
- Power output of at least 50 kilowatts, while reaching up to 350 kilowatts or more in the most advanced systems.
- This higher power output allows Level 3 chargers to deliver rapid charging, significantly reducing the time required to replenish an electric vehicle's battery.
- While crucial for widespread EV adoption, Level 3 chargers are much more expensive and can degrade battery life faster than their Level 2 counterparts.
- Require additional siting considerations and coordination with electric utilities due to their substantial power requirements.
- DCFC have multiple

standards for connectors, three of which are used in North America: SAE **Combined Charging System** (CCS), CHAdeMO, and Tesla's North American Charging Standard (NACS). While all of these connectors are currently used by certain vehicles, until recently many car manufacturers had been increasingly adopting the CCS standard. In May 2023, several automakers announced their intent to offer the ability to use the Tesla NACS connector on their future EV offerings. It is currently unclear whether some/all of these OEMs will continue to include a CCS option on future EV as well as the NACS, or whether the NACS connector will become the new standard. As a result, many EV owners travel with adapter plugs.

Types of EV Fast Charging



SAE Combined Charging System (CCS)

GM, Ford, Honda, Kia, Hyundai, BMW, Mercedes-Benz, Porsche, Audi, VW



CHAdeMO

Nissan, Mitsubishi



North American Charging Standard (NACS) Formerly Tesla Supercharger

Tesla

OEMs who will offer NACS include Ford, GM, Rivian, Volvo, Polestar, Mercedes-Benz, Nissan







Electric motor

Electronic control

Charge port

What Kind of Charger is Right for You?

Editor's note: the following table reads from page 28 to 29.

Charger Type	Input Voltage	Output Power Level	Typical LDV* Charging Time	Cost
DC Ultra-Fast Charger (Level 3)	400-1.000V (DC)	=> 100kW	~20–30 minutes	\$150k-\$500k
DC Fast Charger (Level 3)	400–1.000V (DC)	25–99 kW	1–3 hours	\$100k-\$250k
Fast Level 2	208-240V	7–24 kW	3-4 hours	~\$4,000
Public (networked) Level 2	208–240V	<7-10 kW	6–8 hours	~\$2,500
Home-based Level 2	208, 220 or 240V	6.6 kW	6–8 hours	\$500



Onboard charger

R.

Charging cable



Thermal systems

Use Cases	C. C
 Interstate and intercity travel, passenger and heavy-duty freight vehicles DC Fast Charger (Level 3) =>100kW: within one mile of state or federal highway; at least one ADA-compliant space, with customer amenities (publicly available restroom and food service facilities), no publicly owned EV station to be built within 5 miles of a privately owned EV fast charger station of =>100kW 	DC-DC converter
 Fastest electric car charging option. Up to 250 miles of range per hour. Can charge up to 80% typically in about 20–30 minutes. Used to facilitate longer distance driving on road trips for a quick recharge. DC Fast Charger (Level 3) 25-99kW: at least one ADA-compliant space, with customer amenities (publicly available restroom and food service facilities) 	**
 Shopping centers, car parks, workplaces, offices, hotels and restaurants. Fast Level 2 7-24kW: if four or more EV charger dispensers, at least 10% of spaces ADA compliant, if at private retail establishment, with customer amenities (publicly available restroom and food service facilities) 	Battery pack
 Hotels, workplace, offices, shopping centers, libraries Level 2 <7kW: if four or more EV charger dispensers, at least 10% of spaces ADA-compliant, if at private retail establishment, with customer amenities (publicly available restroom and food service facilities) 	
 Residential, commercial, workplace, offices, restaurants and fleets Average of 25 miles of range per hour Installed by a qualified electrician—can be hardwired or plugged into an existing 240-volt outlet (dryer plug) Best for quick charging – can get a full charge from empty overnight (8-10 hours) 	Battery 12Vdc

Using State Procurement

Using State Procurement, Planning and deployment approach

Step 1: Planning

- Identify goals
- Identify funding source and constraints
- Check in with utility
- Assign project manager

Step 2: Procurement

- Call companies on Statewide Price Agreement (SWPA)
- Site visit and interviews
- Select a contractor
- Complete contract & PO
- Issue Notice to Proceed

Step 3: Construction

- Construction begins
- Check in with utility
- State Board of Finance approval (unless you don't need SBF approval)
- Complete utility connection

Several key steps and elements are necessary for any organization or jurisdiction to effectively plan for and deploy EVSE. Installing an EV charger is no different. Some of the decisions may be made for you already based on your funding source or being awarded grant funds, in other cases you may have more flexibility.

Using State Procurement

A major prerequisite in procuring suitable electric vehicle charging systems is having a deep understanding of how their operators and drivers charge their cars. EV present new electricity "topping-up" challenges for engineers, installers, procurement teams, asset owners, and tenants that traditional cars with internal combustion engines (ICE) do not. ICE vehicles are generally refueled at a petrol service station, forcing a specific visit while en-route or as the sole reason for the trip. This is in stark contrast to zero-and low-emissions

vehicles, which require drivers to regularly "top up" the car battery whenever there is an opportunity to do so. This is comparable to an individual charging their mobile phone at home at night, in the office, or simply when it is convenient. The change from refueling to recharging introduces a new driving and "topping up" behavior. The General Services Division (GSD) has created a process to streamline the planning, procurement, construction, and activation of electric vehicle charging stations for State agencies and local public entities. Using the State of New

Mexico GSD process, getting an EV charger can be as easy as 1-2-3!

Planning and deployment approach

Before you begin any big project, it's important to understand where you want to get. Several key steps and elements are necessary for any organization or jurisdiction to effectively plan for and deploy EVSE. Installing an EV charger is no different. Some of the decisions may be made for you already based on your funding source or being awarded grant funds, in other cases you may have more flexibility.

Step 1: Planning

Before you begin any big project, it's essential to understand what the final outcome is. Installing an EV charger is no different. A site assessment, including load calculations through an audit of the existing electrical system, is best done by a qualified licensed electrical contractor.

Action	What	Timeframe	Where to get help?			
			State Government	Local Government		
Identify & prioritize locations with high traffic counts and preferably near major highways.	Determine EV charger type Meet with utility company to discuss site(s) and project scope	ASAP	NMDOT Special Projects Division - Special.Projects@dot.nm.gov and/or New Mexico General Services Division (NMGSD)	NMML, NMC and/or City/County/ Municipality Office(s)		
Identify funding and prepare construction budget proposal and installation timeframe	Research all available grants, rebates, and tax incentives to offset capital expenses also, determine the impact of product avialabity on installation timing. (Federal Grants, State Funding, Matching Funds, Local Funding)	ASAP	NMGSD, DFA (Anna. Narutamoya@dfa.nm.gov), NM Procurement	NMML and/or NMC (Your local procurement department is also a great resource)		
Project engagement & site location	Identify contractor and other relevant stakeholders	One (1) week after site selection.	Request for Proposals (RFP), Solicitation for Applications (SFA) or State Procurement	NMDOT, city, county, Municipality, Property Owner(s), other relevant stakeholders		
Contact local utility company	Obtain an electrical assessment of your property. Inquire for feedback on location and infrastructure concerns, estimated timeframe for connection access	One (1) week after site selection.	Contact local utility company	Contact local utility company		
Contractor/Project Manager Assigned	Execute contract(s)	Within one (1) week of identifying contractor	GSD Procurement: Resources and Information NM GSD (state.nm.us)	Contact local procurement office, New MML, AofC		
Draft Statement of Work (SoW)	Please refer to example in Appendix.	Within two weeks.	NMDOT–Special Projects Division	NMDOT – Special Projects Division		

Step 2: Procurement

Procurement, especially procurement for an emerging technology like EV charging, can feel complicated. The General Services Division (GSD) has created a process to streamline the planning, procurement, construction, activation, and maintenance of EV charging stations for State agencies and local public entities.

Action	What	Timeframe	Where to get help?		
			State Government	Local Government	
Solicit competitively for applications for a viable contractor or contact contractors listed on GSDs Statewide Price Agreement.	Share your SoW draft, and ask for price quotes.	Two (2) to Four (4) Weeks.			
Prepare Construction Budget	Prepare construction budget to include cost for upgrade of the grid, demand charges (forecast cost for the term of the O&M agreement) if applicable, etc.			NMML, and/or NMC (Your local procurement department is also a great resource)	
Conduct Site Visits	Schedule site visits with at least two (2) to three (3) potential contractors.	Variable	NMGSD, DFA (Anna. Narutamoya@dfa. nm.gov), NM Procurement	NMML, and/or NMC (Your local procurement department is also a great resource)	
Contractor Selected	Identify who your contractor will be, finalize and execute contract(s).	Process begins withing one(1) week of selection.	"NMDOT – Special Projects Division. State Procurement Office. GSD Special.Projects@dot. nm.gov "	NMDOT, NMML, and/or NMC (Your local procurement department is also a great resource)	
Complete and Execute Contract	Ensure your legal department has reviewed the contract(s), and submit notice to awarded contractor.	Immediately following Notice of Award (NoA).	Legal, GSD Procurement: Resources and Information NM GSD (state.nm.us)	NMML, NMC and/or local legal department	
Notice to Proceed	Order charging equipment and installation service.	One (1) Week after contract begins.	GSD Procurement: Resources and Information NM GSD (state.nm.us)	Local Procurement Office, Contractor.	
Draft Statement of Work (SoW)	Provide a narrative evaluation and analysis of the accuracy of the proposed project. Please refer to example in Appendix.	Within Two (2) Weeks.	NMDOT – Special Projects Division	NMDOT – Special Projects Division	

Step 3: Construction & Deployment

As a final step, your contractor will complete the EVSE installation, including facilitating all needed inspections.

Action	What	Timeframe		Where to get help?	
				State Government	Local Government
Secure permits from state/local government	Identify type of permits required: File for necessary permits based on a thorough site plan(s), provide necessary documentation based on grant requirements	Permit process timeframe is based on filing process, may take up to 40 days.		GSD Procurement: Resources and Information NM GSD (state.nm.us)	NMML, NMC, local procurement department, and/or Contractor
Check in with utility company early and frequently	Receive and estimated timeline for utility connecttion(s) and charger connection(s)	Immediately upon receiving Notice to Proceed.		GSD Procurement: Resources and Information NM GSD (state.nm.us) and Contractor	Contractor
Construction begins	Prepare and install charging equipment and installation service	Three to Six months (including site preparation, equipment shipment, and contractor scheduling).		Receive an estimated timeline for utility connection(s) and charger connection	Receive an estimated timeline for utility connection(s) and charger connection
Get exemption from the State Board of Finance (SBOF)	State Board Of Finance has a standard exemption to allow state agencies to accept credit card payments via the EV charger.	One (1) week		GSD, Project Manager	Add phone number/link to SBoF
Utility Connection(s)	Depending on the infrastructure upgrades required, this part can take up to 1 year. Contacting your local utility early and frequenetly can help minimize the delay.	Three (3) months+		Local Utility Company and GSD	Local Utility company, Local Procurement Office, Contractor.
Commissioning					
Unveil charging station(s)	Make Public announcement and release marketing materials.	During/after charging equipment is commissioned		NMDOT	Local Agency

Operations & Maintenance

General maintenance, Operating EV charging stations, Future solutions trends for EV infrastructure

When contracting for maintenance of charging stations, be clear on who holds the liability and responsibility of the system, components and the operations. This is not always consistent, and the responsibility can either rest with the site host, charging network, manufacturer or installer.

General maintenance

Most EV charge points are unsupervised and require minimal maintenance. However, to ensure the safety of your equipment, it is recommended to safely store charging cables and conduct a service check of your EV chargers every year. The service check should ensure structural integrity and weatherproofing of the system, airflow to cooling fans and vents, as well as wear-and-tear of sockets and tethered plugs.

Software upgrades for the chargers and point of sale terminals will also need to be carried out regularly. For any maintenance, we suggest including a response time, duration for the required repair, and an overall uptime requirement. Other general maintenance involves keeping the charging station clean and the charging connectors dry.

When contracting for maintenance of charging stations, be clear on who holds the liability and responsibility of the system, components and the operations. This is not always consistent, and the responsibility can either rest with the site host, charging network, manufacturer, or installer.

There are a wide range of maintenance contracts with differing costs, which typically encompass maintenance, servicing, extended warranties, data services and insurance. Owners should budget for the maintenance of a single charger. Warranties are crucial in covering the cost of replacement and, depending on a tender response, some vendors will offer extended product and workmanship warranties. Consider listing minimum warranty and service requirements in the tender document.

Operating EV charging stations

Operating an EV charging station involves ensuring that the site amenities are safe and functional, We recommend obtaining advice from a qualified engineering professional, as they will be able to inform you of the electrical capacity of your site and provide suggestions to how to best future-proof it.

chargers are available to be used by electric vehicles, payment systems are online, and the energy is being supplied as per the retail and network contracts. The largest operational costs for an EV charging station are typically the network charges within your electricity contract. These costs are fixed for the whole year once a peak demand event occurs. It is therefore important to account for this as it will impact the profitability of the EV charging stations. There are a few ways in which this can be managed, namely by adjusting the price on a monthly basis in line with the electricity contract, installing a battery

or other demand side energy management solutions, or negotiating appropriate electricity tariffs.

Future solutions and trends for EV infrastructure

As indicated previously, procuring EV infrastructure may require a staggered approach as it is often not commercially feasible to electrify an entire site at a single point in time. Even though you may not wish to install EV supply equipment in the immediate future, we recommend a proactive and longterm approach to future-proofing your site, as this can minimize the risks of higher costs in the future. We recommend obtaining advice from a qualified engineering professional, as they will be able to inform you of the electrical capacity of your site and provide suggestions on how to best futureproof it. This is often technically complex and multi-faceted. Understanding each site thoroughly may include conducting a comprehensive assessment of your energy contracts, existing energy systems like solar and batteries, and planning for other fast-moving energy and eMobility trends, such as the rise of connected vehicles, or bi-directional and wireless charging.

We are committed!



We want to underscore that these guidelines and New Mexico's approach to this new era are a work in progress. We will make mistakes, and we need your feedback and assistance. We want to hear from you!

We hope this guide has helped you and your agency demystify installing EV chargers at your places of work and in your communities. The State of New Mexico and the public sector entities where you work are committed to bringing electrified transportation and all its benefits to every corner of the State. Whether it's fueling or maintenance, EVs cost less over time than their gas-powered counterparts. EVs also produce dramatically less harmful air pollution, helping improve our air quality and reducing instances of asthma and other respiratory illnesses.

In the coming year, the government's role in standing up and operating EV chargers will give way to the efficiencies of the private sector. In the meantime, all of us must work in the public sector and lead by example. The advent of electric vehicles as a principal means of transportation is upon us. Governor Michelle Lujan Grisham wants New Mexico to be a center for best practices to be emulated around the country.

We want to underscore that these guidelines and New Mexico's approach to this new era are a work in progress. We will make mistakes, and we need your feedback and assistance. We want to hear from you!

Special thanks to all the state agencies and private sector entities that assisted in developing this Guidebook. Matthew Hunt at NMDOT put in many hours in the graphic design and layout of the Guidebook. The New Mexico Municipal League has been a steadfast partner in providing a critical local government perspective. Our co-ops that serve rural New Mexico and PNM in the larger urban areas have been indispensable.

As we go to print on this Guidebook, New Mexico has a rate of about 4% of new car sales being electric. In metropolitan areas, the percentage is now above 10%. Those numbers will change dramatically in just the next two years. We encourage you to make your agency, county, or municipality a leader. Join us!

Your EV Charger Working Group

Martin Chavez; Ron Flax-Davidson; Sydney Lienemann; Drew Lovelace; Michael Morrison; April Naranjo; Alison Nichols; Mario Romero; Ricky Serna; Anna Silva; Rebecca Stair; Charles Trujillo; Jerry Valdez; AnnaLinden Weller; and John Williamson



Appendix

Commissioning, EV charging considerations



Manual on Uniform Traffic Control Devices (MUTCD)

https://mutcd.fhwa.dot.gov/ resources/policy/rsevcpfmemo/



NMDOT District Map & Contact Information

https://www.dot.nm.gov/contact-us/districts/



Commissioning

What is Commissioning? This last installation step, which ensures the EV charger is programmed safely to the correct amperage and voltage, ensuring the EVSE does not dispense too much or not enough energy and trip the circuit breaker. Commissioning must be completed by your contractor or electrician to ensure the site of the EVSE has been prepared to specifications by the contractor.

Something to take into consideration; EV Commissioning projects involve working across multiple stakeholder groups and require expert process development. This process may differ from vendor to vendor.

EV charging considerations

Local governments can support the deployment of EVSE through planning, policies, regulations, incentives, and installation of sites. A review of approaches in cities and states across the country revealed the following best practices:

- Incorporate EVSE needs into comprehensive planning efforts to achieve EV readiness.
- Establish specific goals for the number of publicly available charging ports to be deployed locally, by a given year, setting EVE deployment targets.
- Deploy EVE on public land for residents and visitors, to encourage EV adoption.

- Adopt a streamlined permitting and inspection process for EV charging installations, enabling more rapid, predictable, and less costly deployment of EVSE.
- Establish EV-ready infrastructure requirements in building codes and ordinances.
- Establish minimum EV parking requirements and ratios.
- Enact laws that compel housing and community associations to allow EVE deployment.
- Develop educational resources to increase EV awareness for residents, local businesses, and developers.



GS State-wide price agreement

https://www.generalservices.state. nm.us/state-purchasing/statewide-price-agreements/



