Pole-Mounted Electric Vehicle Charging

Regional Electric Vehicle Deployment (REVD) Working Group

20 March 2025

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DEPARTMENT OF ENERGY & ENVIRONMENT

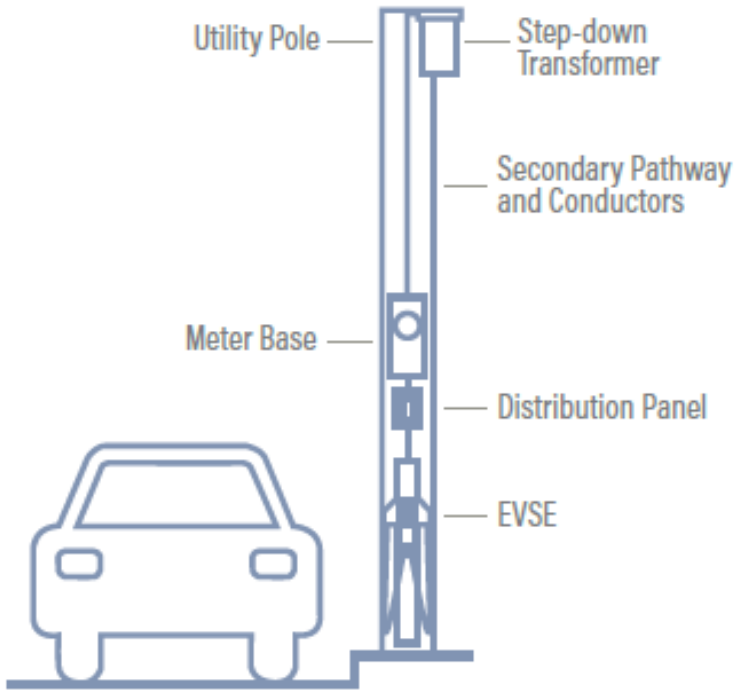
What are Pole-Mounted EV Chargers?

- EV chargers installed on utility or streetlight poles
- Typically Level 2
- Utilize existing electrical infrastructure
- Eye-level or elevated with retractable cords

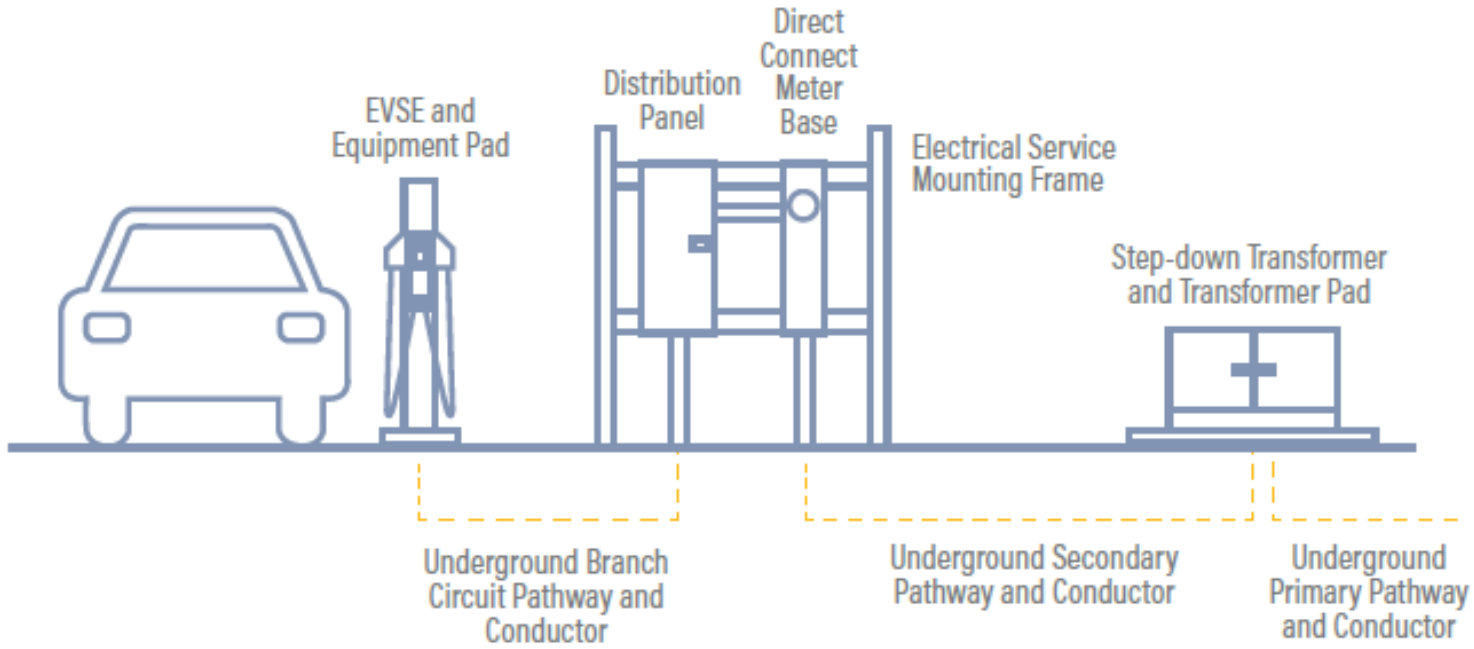
Eye-level pole-mounted charger on utility pole in Portland, OR

Elevated pole-mounted charger on streetlight pole in Los Angeles, CA

Pole-Mounted Charger

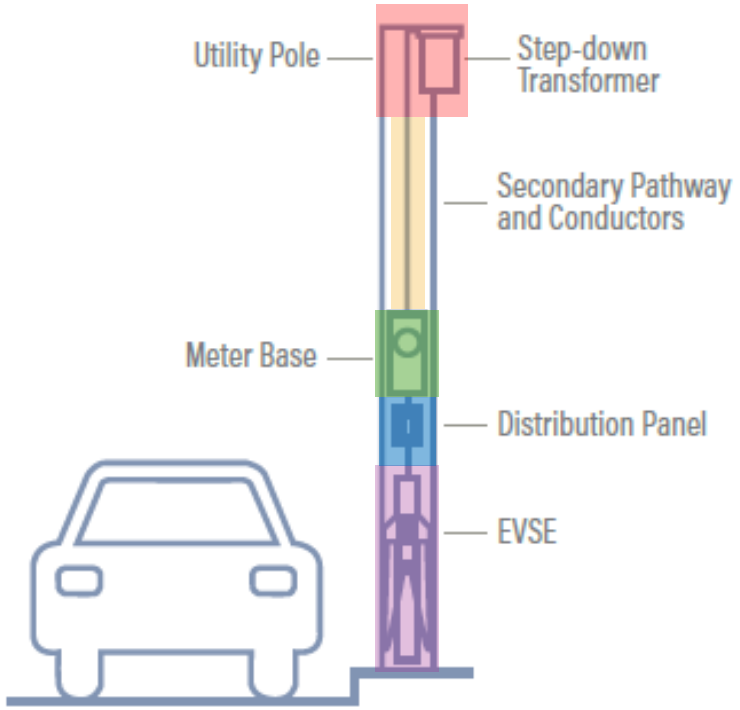


Ground-Mounted Charger

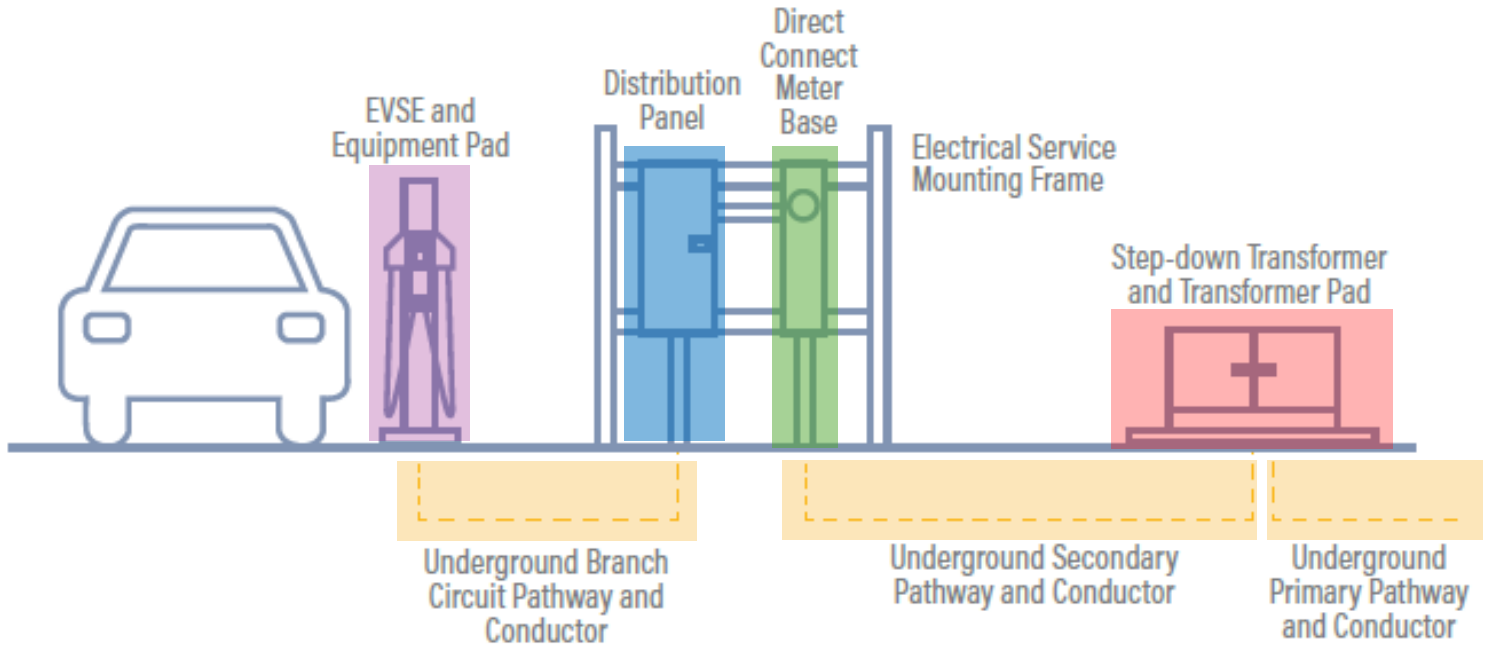


Source: Portland General Electric. (2020)

Pole-Mounted Charger



Ground-Mounted Charger



Source: Portland General Electric. (2020)

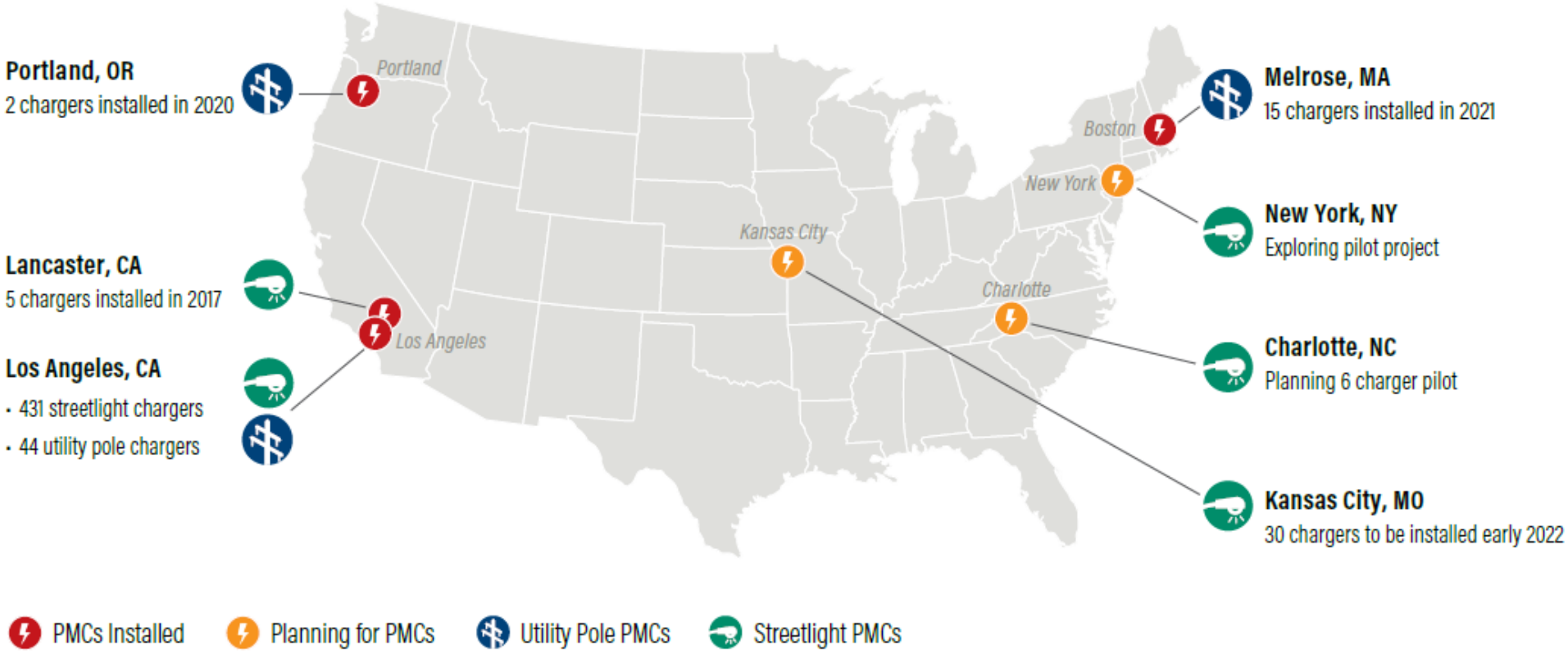
Benefits of Pole-Mounted EV Chargers

Pole-mounted EV charger in Los Angeles, CA

- **Lower cost to install** than ground-mounted chargers because use existing infrastructure
- **Efficient use of space** in the curb zone
- **Expand access** for drivers without home charging (esp. renters & multifamily residents)
- **Easier to install and move,** if needed, to meet evolving charging and right-of-way needs

Existing Examples

Pole Mounted Chargers Planned & Installed in U.S. Cities in 2021

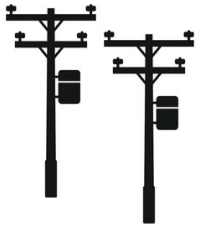


Notes: Some cities have installed PMCs on utility poles, streetlights, or both. Several other U.S. cities, not depicted here, have pursued PMCs to some degree but have been unable to proceed due to various technical or political barriers.

Source: World Resources Institute. (2021)

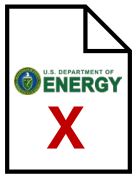
Project Timeline

2020



Pilot Project

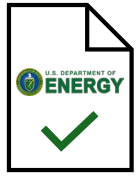
2021



Applied for federal grant to scale project
Unsuccessful

Began **plan & policy development + stakeholder engagement**

2022



Applied again for federal grant to scale project
Successful

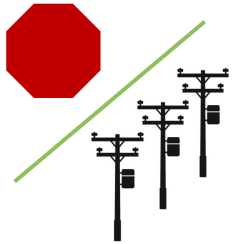
2023

Notified of federal grant award

2024

Signed contract with US DOE

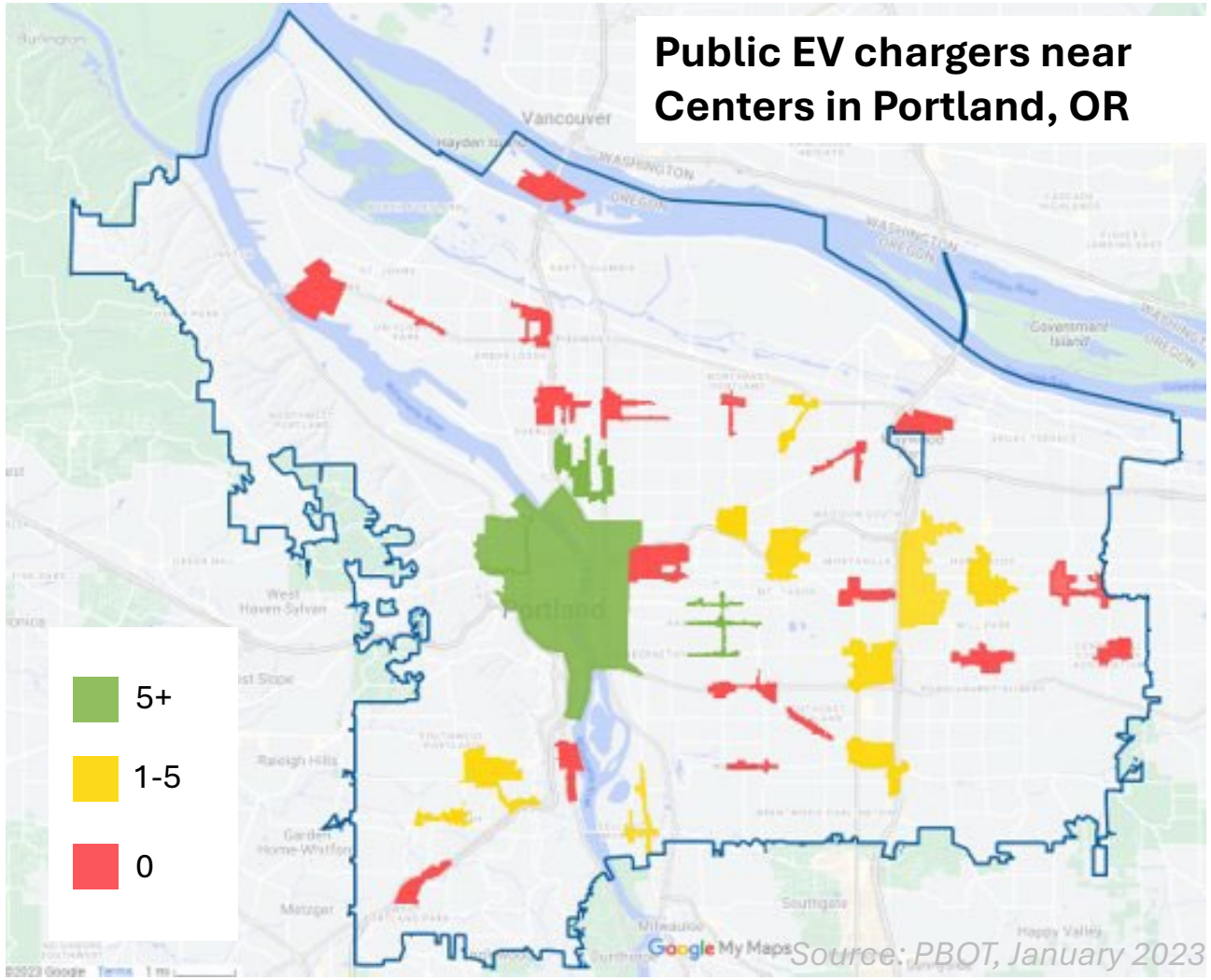
2025



Jan
Cease & desist order

Dec
40 chargers operational
(🤞)

Scaling the Project | **Public EV Charger Analysis**



- Public EV charging unevenly distributed
  - > 1/3 of public chargers in Central City
  - Charging gaps in North and East Portland
  - Few chargers near multifamily buildings

Scaling the Project | **Siting Strategy**

Pole-mounted EV charger in Portland, OR

Criteria

- Lack public EV chargers
- Near commercial centers (hubs of population, housing, jobs)
- High concentrations of multifamily buildings
- High concentrations of renters
- Limited off-street parking
- Likely to rely on personal vehicles
- **Pole characteristics** (age, size, height, risers)
- **Pole location** (parking, ADA ramps, door zone, mailboxes, trees, etc.)

Lessons Learned

- **City code & policy updates** are required to set the stage for pole-mounted chargers.
- **Streamlined permitting & contracts** for curbside EV charging infrastructure can help simplify and accelerate expansion of pole-mounted chargers.
- **Convene a wide range of stakeholders early in the process-** lots of people care about installing pole-mounted chargers on streets and meeting with them is important for **change management** and **program design**. Convening a wider group from the outset may reduce number of meetings required down the line.
- **Strong partnership between city and utility** is critical.
- **Striping & signage** necessary for preserving EV access to charging spots.

Planning Considerations | **Legal & Regulatory**

- **Legal & Regulatory Framework**
  - **Clarify Ownership & Authority**: define whether the city, utility, or EV charger companies will install, operate, and maintain pole-mounted chargers
  - **Right-of-Way (ROW) Use Regulations**: amend city code to explicitly allow EV chargers in the public ROW; establish permitting requirements for using utility and streetlight poles in the ROW
  - **Master Lease Agreement (MLA)**: consider a master lease agreement where the city "leases" ROW space for chargers to utilities or EV charger companies and establishes the terms for installing and operating chargers in public spaces instead of requiring a separate agreement for each site—simplifies permitting and approval process and protects the city from financial loss
  - **Zoning & Land Use Compatibility**: ensure pole-mounted chargers comply with zoning laws, historic district protections, and urban forestry policies; make necessary amendments to ensure they are allowed in high-density residential and mixed-use areas.

Planning Considerations | **Technical & Infrastructure**

- **Technical & Infrastructure Standards**
  - **Pole Suitability Criteria**: identify viable poles for hosting chargers (age, height, weight capacity, structural integrity, etc.), evaluate curb zones around viable poles
  - **Electrical Capacity & Upgrades**: determine grid capacity, electrical connections, whether existing streetlight circuits can support EV charging; outline when separate metering or electrical upgrades are required
  - **Safety Standards**: set clear installation, maintenance, and fire safety standards; ensure compliance with relevant National Electric Code (NEC) & National Electric Safety Code (NESC) and utility regulations to ensure safe operation
  - **Resilience & Reliability**: weatherproofing and vandalism protection; develop a policy for backup power solutions (e.g., battery storage)
  - **Siting Analysis**: identify priority siting criteria—consider prioritizing areas with density of destinations, limited public charging, residents without access to home charging, and car dependence.

Planning Considerations | **Permitting & Approval Process**

- **Permitting & Approval Process**
  - **Permits**: define & streamline required permits (e.g., street opening permit, electrical permit, encroachment permit, EV charging zone permit, utility license, ROW use license, etc.); develop an expedited approval process for pole-mounted chargers
  - **Site Evaluation & Review**: set up a multi-agency review process (e.g., transportation, utilities, forestry, etc.); consider requiring impact assessments
  - **License & Operational Agreements**: require agreements with utilities and EV charging companies to outline maintenance responsibilities, revenue-sharing, and performance metrics

Planning Considerations | **Accessibility & Equity**

- **Accessibility & Equity Considerations**
  - **ADA Compliance**: maintain accessible pedestrian pathways. Consider height, reach, and usability for people living with disabilities.
  - **Equitable Distribution**: install chargers in low-income and historically underserved areas; consider low-cost charging options or subsidies.
  - **Community Engagement**: solicit input from community on charger locations and feedback on proposed sites; reach out to community before installation to educate, address concerns, and gain support.

Planning Considerations | **Financial & Cost-Sharing**

- **Financial & Cost-Sharing Mechanisms**
  - **Fee Structures**: set reasonable permit fees and pole access fees to cover administrative costs that do not discourage charger deployment
  - **Funding**: explore cost-sharing between utilities, EV charging companies, and government agencies; identify grants, incentives, and federal/state funding opportunities
  - **Metering, Pricing, & Billing**: determine metering requirements and how users will be charged (e.g. per-use, per kWh, subscription models, etc.)

Planning Considerations | **Operation & Maintenance**

- **Operation & Maintenance**
  - **Operation:** set operating standards (e.g., uptime running requirements) to ensure chargers remain operational
  - **Maintenance**: clarify who maintains pole-mounted chargers; require regular and prompt inspections, reporting, and repairs
  - **Signage & Striping**: require clear signage & striping to prevent non-EV parking in charging spots;
  - **Enforcement**: develop enforcement policies for parking, charging limits, violations, and vandalism.
  - **Performance Monitoring**: identify key performance metrics and create data-sharing agreements to monitor charger use and evaluate placement
  - **Collaboration**: develop strong working relationships and clearly define roles among cities, utilities, and charging station companies; identify interested stakeholders and meet with interested parties to hear concerns and ideas for pole-mounted chargers

Resources

- Shrestha, A. (2020). “Pole-Mounted EV Charger White Paper: Portland General Electric’s Learnings from Deploying Two Utility Pole Chargers.” Portland General Electric (PGE). https://edocs.puc.state.or.us/efdocs/UAA/adv1081uaa17201.pdf.
- Werthmann, E. and V. Kothari. (2021). “Pole-Mounted Electric Vehicle Charging: Preliminary Guidance for a Low-Cost and More Accessible Public Charging Solution for U.S. Cities.” World Resources Institute (WRI). https://www.wri.org/research/pole-mounted-electric-vehicle-charging-preliminary-guidance.