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# "EV Ready for Concord":
# A Multi-Dwelling Unit (MDU)
# Electric Vehicle (EV) Charging Pilot Program

September 4th and 10th, 2019

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# Agenda

1. Why get ready for EV charging now?
2. What do you need to consider to be ready for EV charging?
3. How can the EV Ready Pilot Program help?
4. How can the Shared Charger Program help?
5. Are you a good candidate for these Programs?
6. What questions and feedback do you have?

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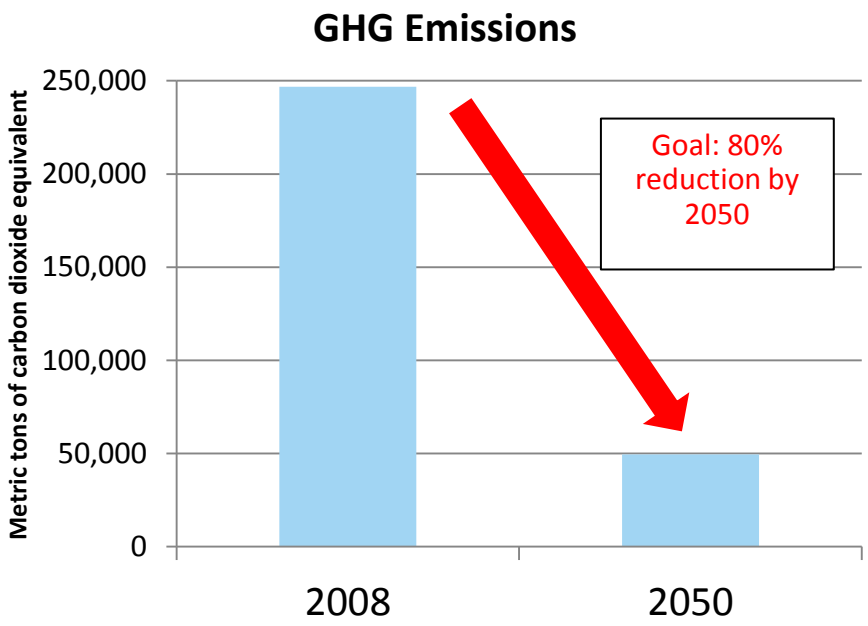
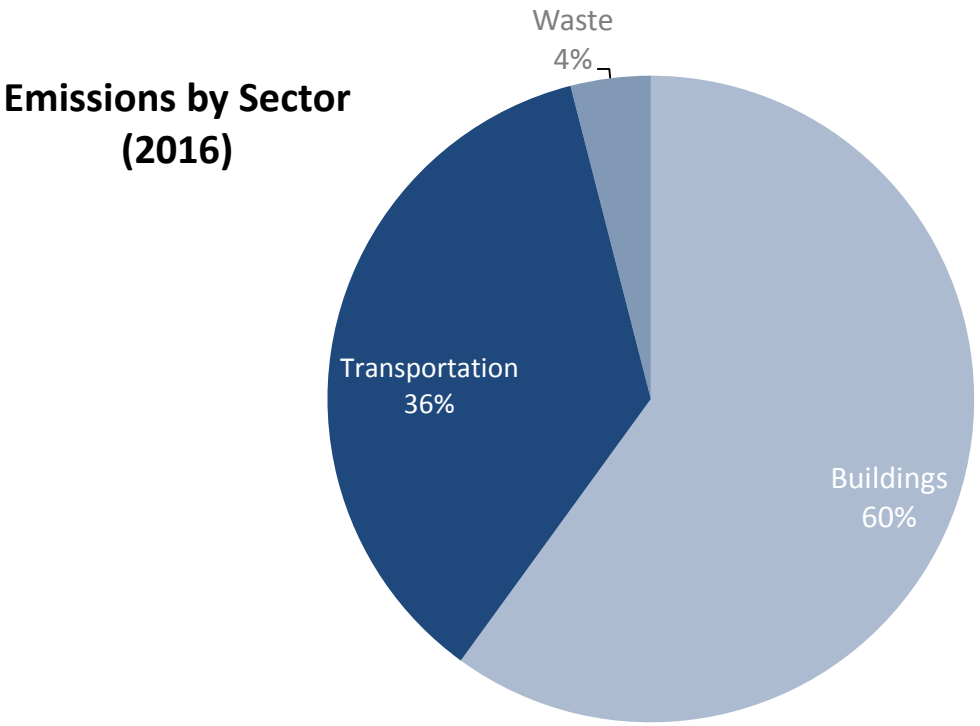
# Why get ready for EV charging now?

## Concord has committed to reducing GHG emissions

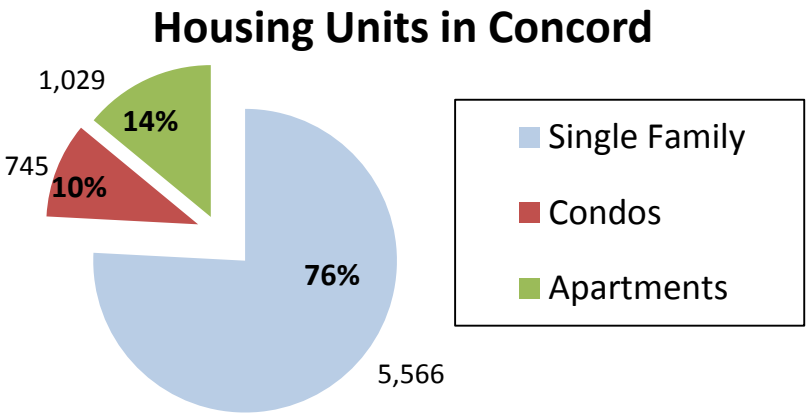



## Vehicles contribute to almost 40% of emissions




A key GHG emissions reduction strategy is to **electrify transportation** and **source electricity from non-emitting resources**

# MDUs in Concord




There are approximately 7,340 housing units in Concord

- 745 condominiums
- 1,029 apartments
- 5,566 single-family

**¼ of all housing units in Concord are in MDUs**

**Unique challenges to charging MDUs**

- Should MDU management be ***reactive*** or ***proactive*** to EV charging?
- Residents can't make EV charging installation decisions independently
- New investments require an explicit vote of approval by the majority of the ownership (condos)
- Late adopters of EVs may not want to pay for a benefit they won't be using

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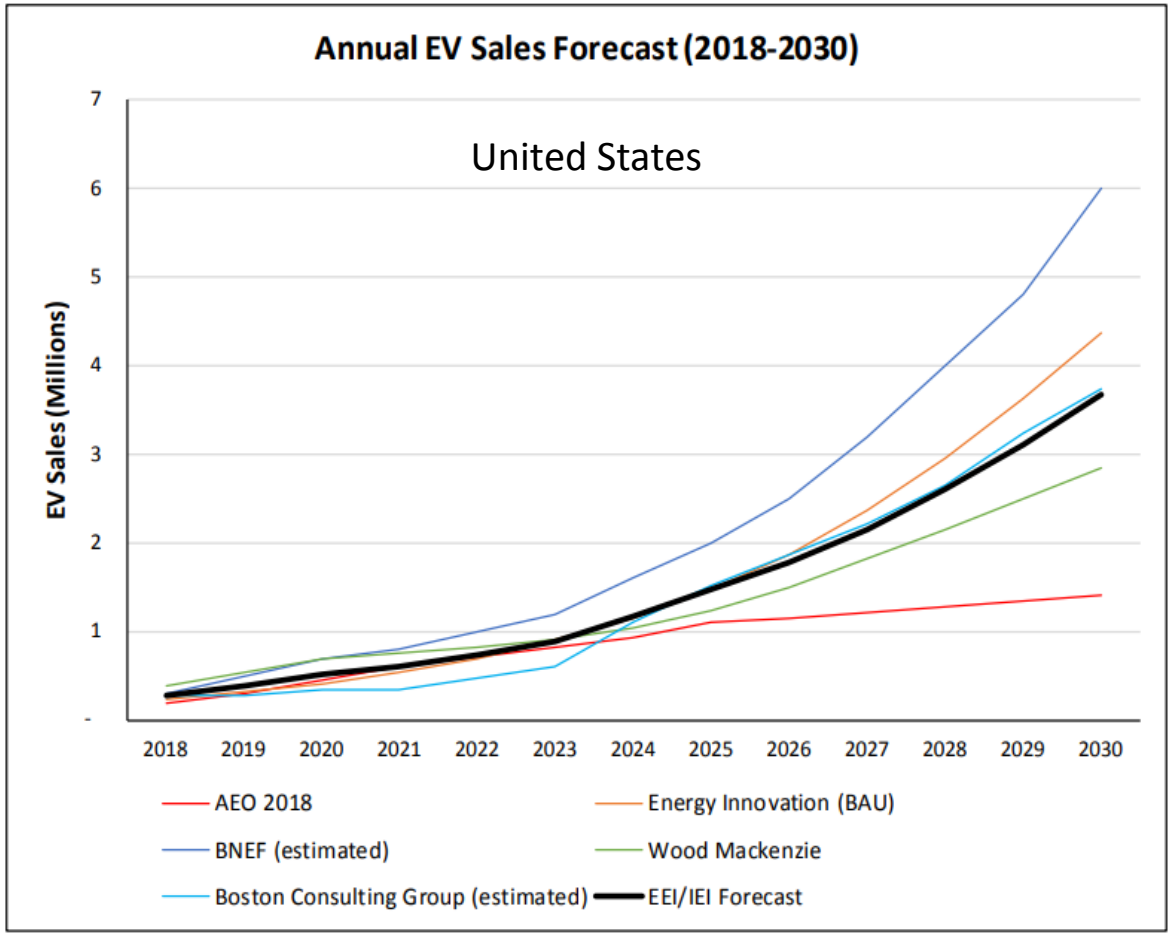
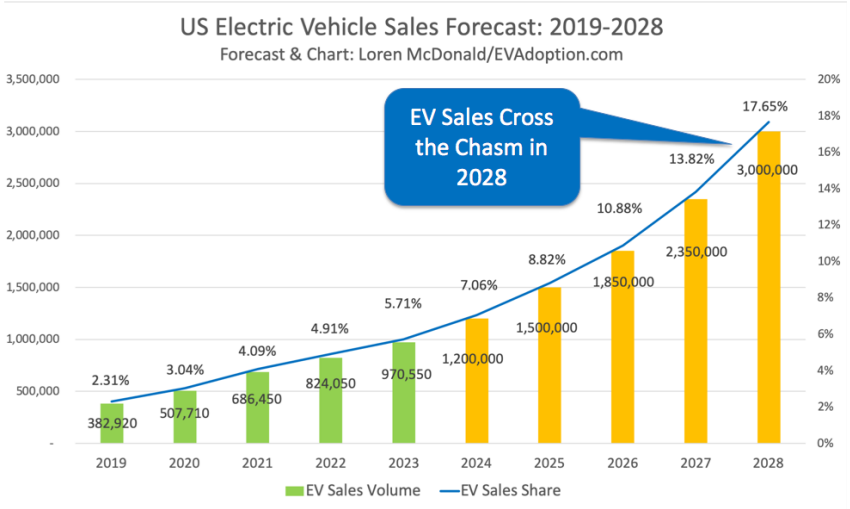
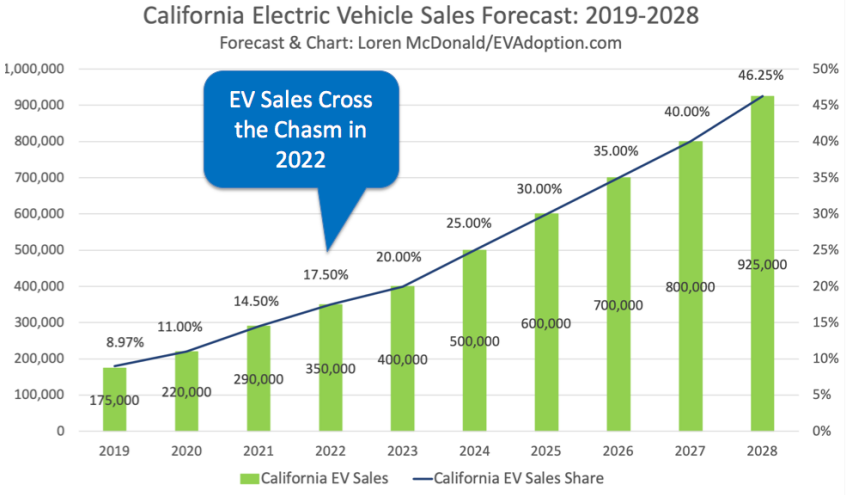
# Electric Vehicle Adoption



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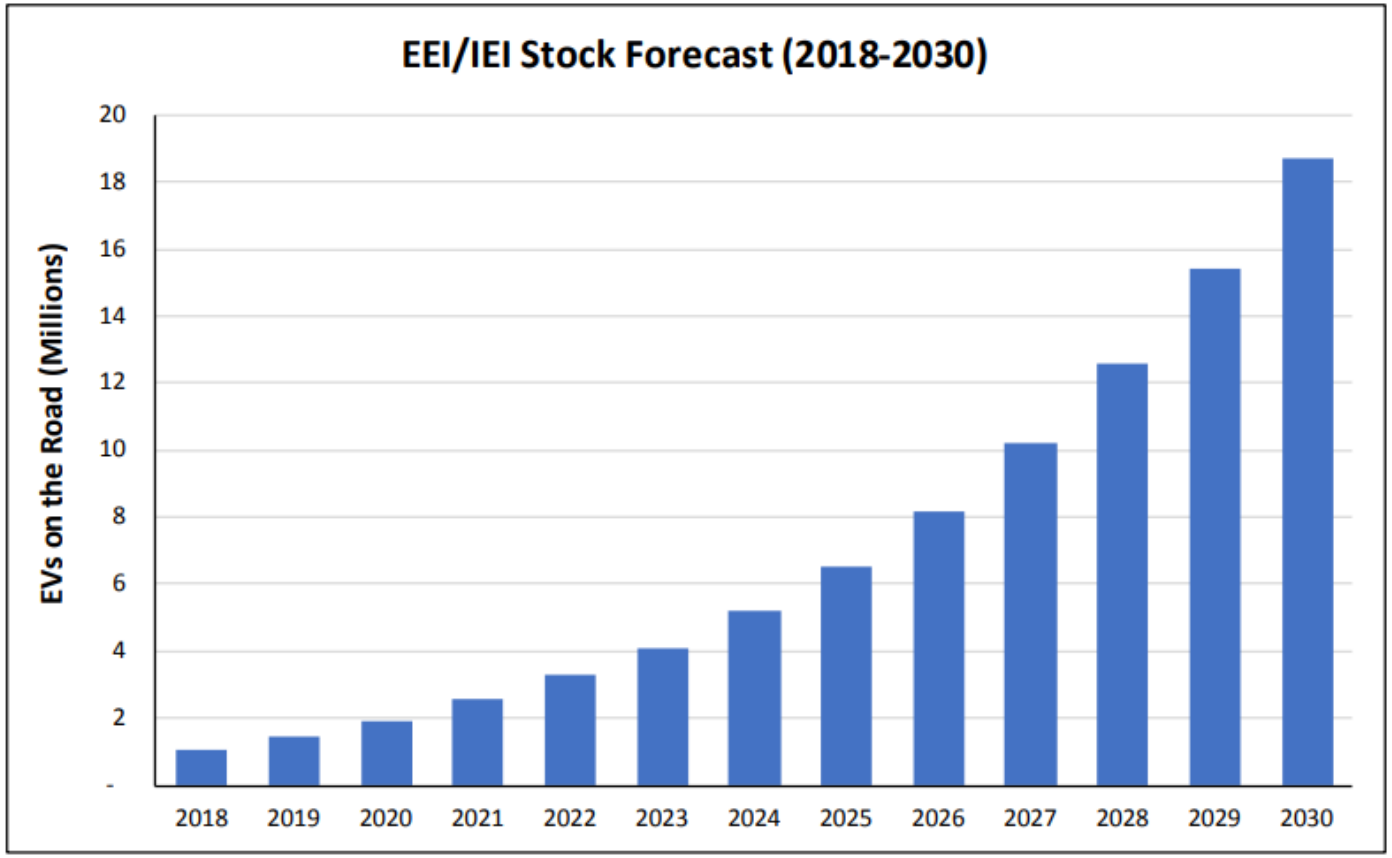
## U.S. EV Forecast




- There will be roughly **20 times** the number of EVs on the road in **2030** than there were in 2018
- In 2030 EVs will be 7% of the 259 million vehicles (cars and light trucks) expected to be on U.S. roads
- By 2040 30% of the *global* passenger fleet is expected to be electric

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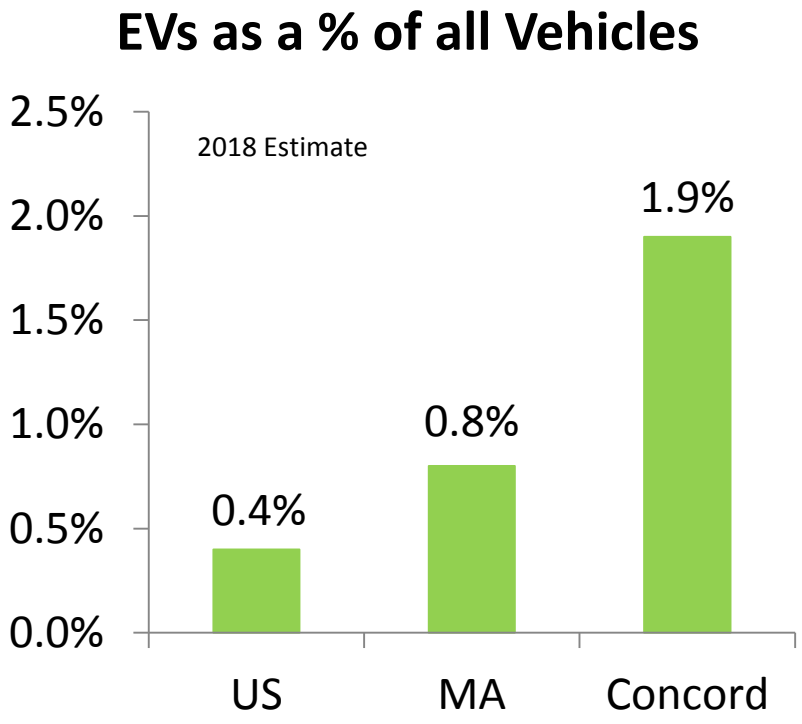
# EV Adoption in Concord

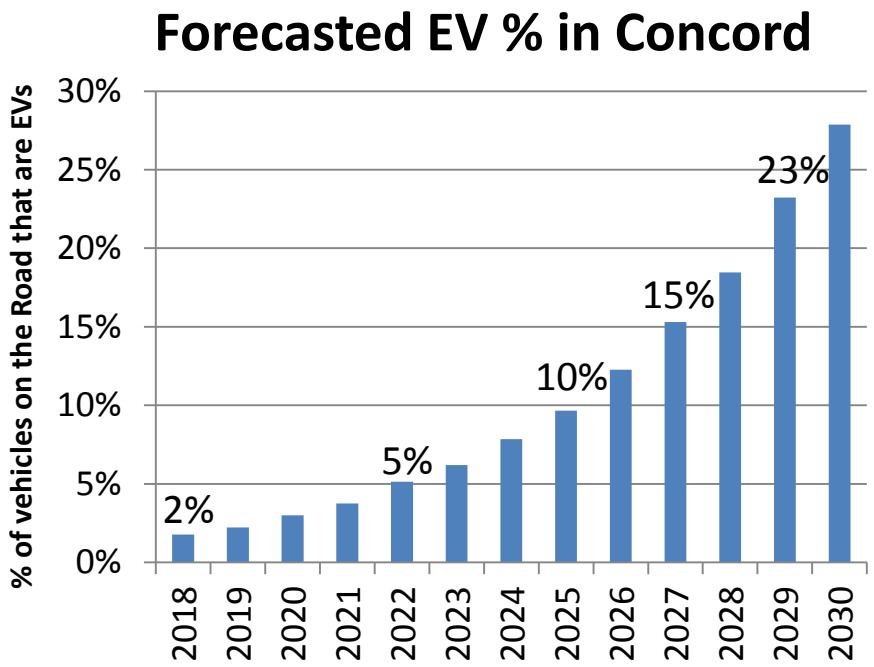
2018

United States
- 1.1 million EVs
- 276 million vehicles
- **.4% EVs**

Massachusetts
- 18,000 EVs
- 2.35 million vehicles
- **.8% EVs**

Concord
- 315 EVs
- 17,000 vehicles
- **1.9% EVs**




***It's not too early to plan for future EVs!***

**EV adoption in MA is twice that of the U.S. Concord is over twice MA.**

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# What do MDUs need to consider to be ready for EV charging?

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# Important Considerations

- ✓ Speed of charging
- ✓ Parking area type
- ✓ Dedicated vs. shared charging configurations
- ✓ Charging station connection process

# Types of Charging

| Type of Charging | Power Levels (installed circuit rating) | Charge Time* |
|---|---|---|
| **AC Level 1** | 110/120VAC at 15 or 20 Amps | 16 hours |
| **AC Level 2: 6.6 kW (medium)** | 208/240VAC at 40 Amps | 4-8 hours |
| **DC Level 3** | Not available thru pilot | 20-40 minutes |

*Refer to vehicle specifications for exact ratings.

Source: https://cleancities.energy.gov/files/u/news_events/document/document_url/78/2_-_MDU_challenges_successes_6-22-15.pdf

# Dedicated Charging

- 1 charging outlet per parking space
- Located at your parking spot
- Charge whenever you want
- Self-owned; Individually metered
- 1 bill sent to 1 person by CMLP

# Shared Charging

- 1 charging station serves 1 or more unassigned parking spaces
- You move car to charger, then back to your spot
- First come-first served charging and/or coordination of scheduling among drivers
- CMLP or MDU-owned
- Pay at the charging station

| | The Good | The Bad | The Ugly |
|---|---|---|---|
| **Dedicated** | ➢ Same user experience and convenience as in single family home. | ➢ Charging at your parking space requires installing or upgrading wiring that crosses common areas. | ➢ The installation of common area infrastructure is perceived to be excessively difficult and/or expensive. This perception discourages research on options to enable dedicated EV charging. |
| **Shared** | ➢ Installing one or more shared charging stations is simpler than installing wiring to each parking spot.<br>➢ Installation less expensive per EV served if many users. | ➢ Drivers won't want to move their cars to charge up, especially at night.<br>➢ Not guaranteed to have EV charged when needed. | ➢ What are the rules for fair access?<br>➢ Who will enforce the sharing rules?<br>➢ Shared charging equipment requires network services (and fees) in perpetuity. |

**See handout for more good, bad and ugly.**

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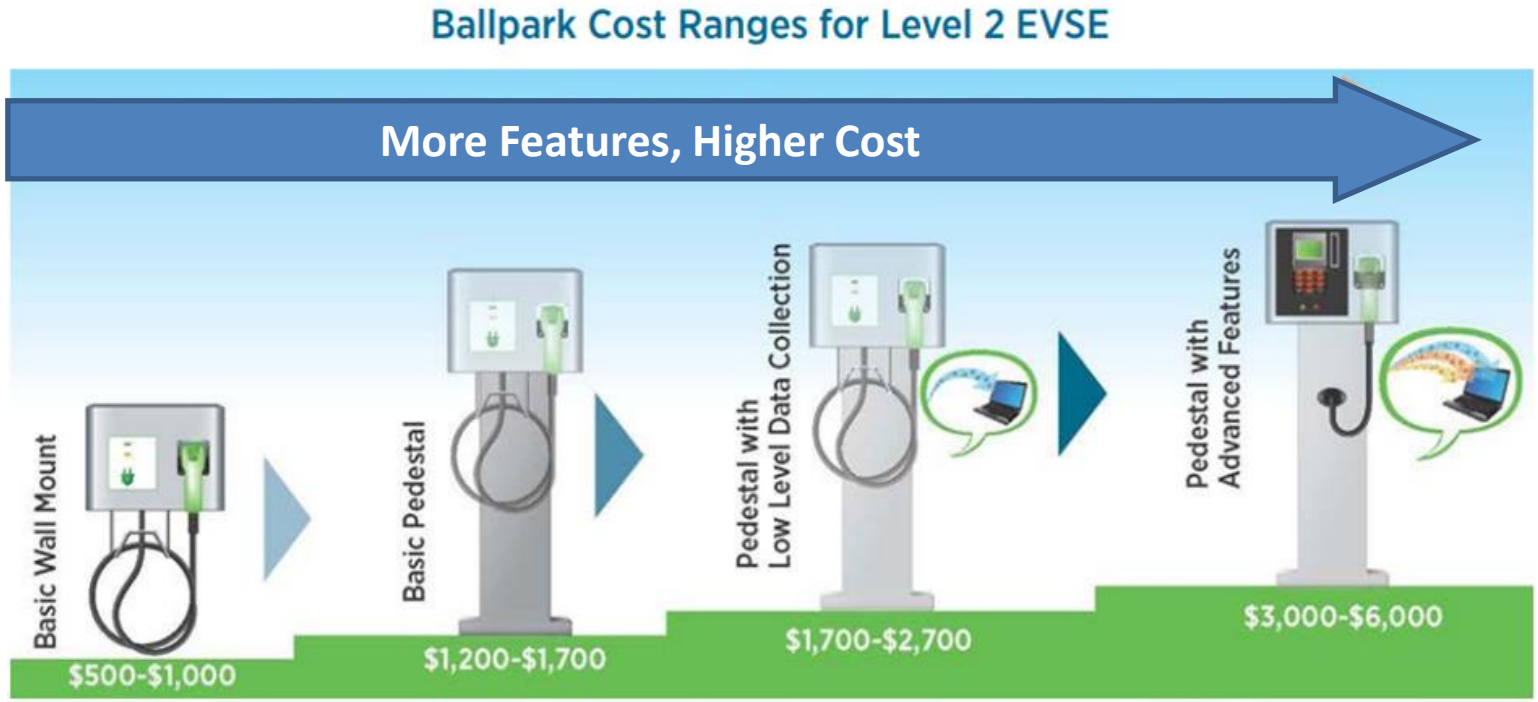
# Dedicated Charging Equipment



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## Dedicated Charging Equipment

**NEMA 14-50 Outlet**

+

**Level 2 Charging Cord**

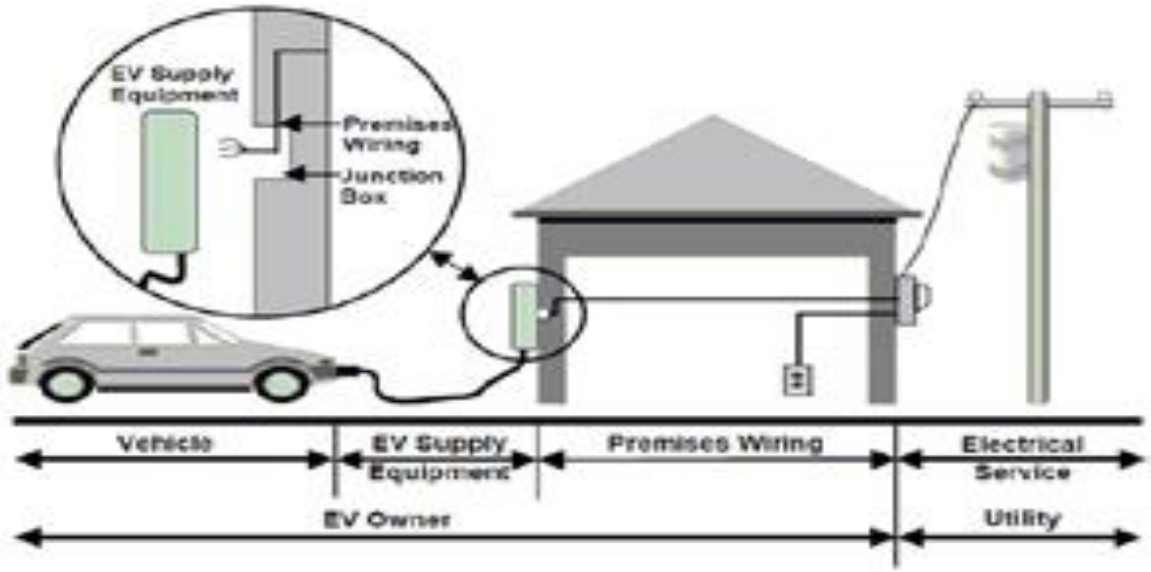
+

**Cord Management**

# Shared Charging Equipment

# EVSE Connection Process

E
V

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where will the wire run from the panel to the EVSE?

is there sufficient capacity at the panel for a dedicated circuit for each EVSE?

is there sufficient capacity from the electric distribution lines and the transformer?

# Parking Area Types

1. Indoor parking areas inside or attached to the dwelling area (e.g. common underground garage or multiple individual garages)

2. Covered and walled parking remote from dwelling s (e.g. walled carports or garages)

3. Uncovered parking area remote from dwellings

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# EV Ready Pilot Program

- Helps MDUs install charging infrastructure
- Helps CMLP better understand how we can help
- Creates real life examples of how EV charging is done at MDUs with different parking area types

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# EV Ready Pilot Program

## CMLP's Goals

- ❑ Select 3 pilot program participants, each with ≥ 5 living units
- ❑ Pilot charging installation in each of the 3 parking area types
- ❑ Include at least one condo complex and one rental property

## Benefits to MDUs

- ✓ Free engineering services for design of EV charging infrastructure
- ✓ Tool for forecasting how many EVs will be owned by your MDU's residents in 5 and 10 years
- ✓ Financial incentives to help defray installation costs
- ✓ Billing assistance for EV charging
- ✓ Electric rate incentives for charging EVs during off-peak hours

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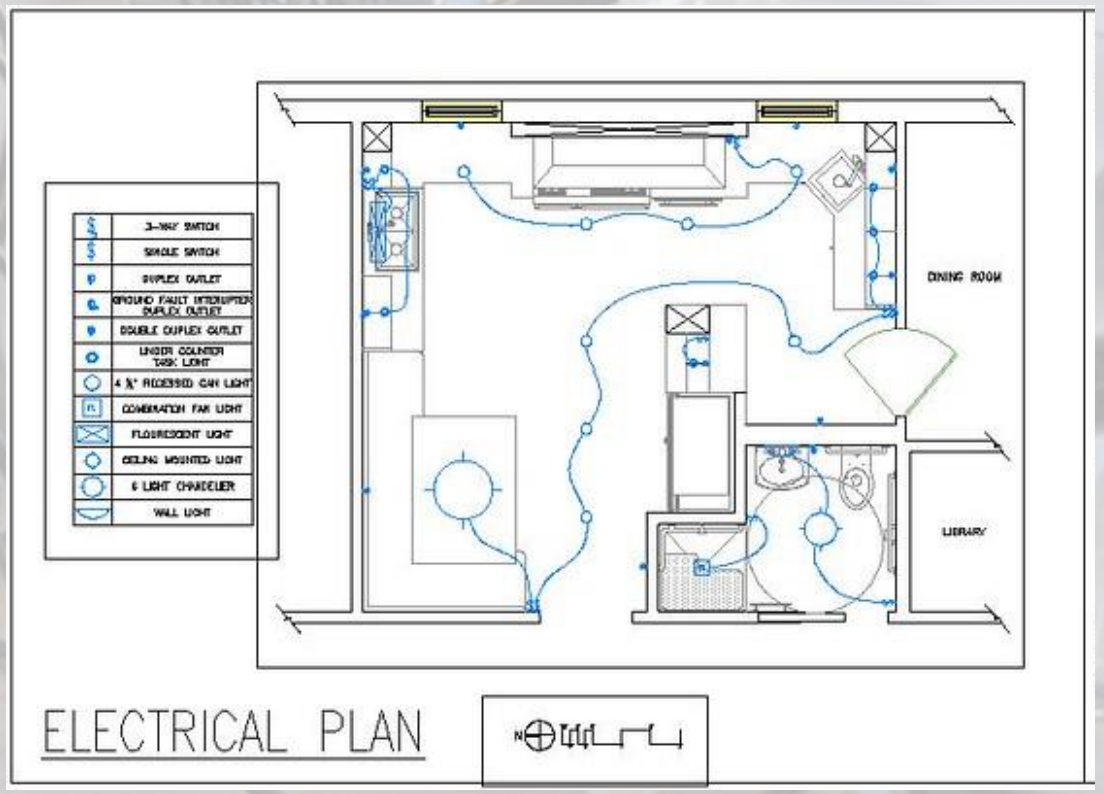
# Engineering Services

- Cost Estimates
- Detailed specifications
- Plans and diagrams
- Plans stamped by PE, appropriate for construction purposes



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# Benefits of Engineering

- Help to compare costs and installation requirements for dedicated and shared charging options
- Specifications will incorporate installation best practices, including upgradability
  - Upgrading infrastructure is less expensive and less disruptive than scrapping and replacing
- Provides a property-wide, long-term plan that can be implemented in phases over time as EV ownership grows
  - Ability to incorporate phases into other property improvement projects to improve affordability
- Includes property-wide cost estimates for budget planning

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# Financial Incentives for Installation

- ✓ CMLP will provide a total of $75,000 in financial incentives for installation across 3 pilot participants. Can be used for:
  - ✓ Equipment
  - ✓ Installation Costs
- ✓ Funding allocation method to be determined once costs and installation requirements are known
- ✓ MDU responsible for any common area costs above CMLP's contribution

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# Billing Support and Incentives

## Current dedicated charging electric rates

| | | | |
|---|---|---|---|
| Off-Peak | 10 PM to 12 noon Monday – Friday and 24 hours per day on weekends | $0.11/kWh | $0.77 eGal |
| On-Peak | 12 noon to 10 PM Monday – Friday | $0.22/kWh | $1.62 eGal |

Compares to regular residential rate of $0.15 to $0.19/kWh

## Proposed shared charging electric rates

| | | |
|---|---|---|
| 2 PM-7 PM Monday - Friday | $3.00/hr | ($3.33 eGal) |
| 7 PM-10 PM Monday - Friday | $2.00/hr | ($2.22 eGal) |
| 10 PM-2 PM Monday – Friday<br>24 hours per day on weekends | $1.20/hr | ($1.33 eGal) |

Note: Shared charging stations will not be available for use during a 4-hour period on about 8 weekday summer afternoons, to help manage the Town's summer electrical peak. 30% of the costs paid by CMLP customers on their electrical bills is related to the amount of electricity used during the summer peak demand hour.

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# How to Apply

- Step 1: Apply to receive engineering design services
  - If more than one combination of applicants represents all parking area types and one condo & one rental property, CMLP will then consider:
    - Percentage of households who already own EVs, or are committed EV purchasers within 6 months of charging infrastructure completion
    - Your MDU's history of completing projects successfully
- Step 2: If selected, provide input to design process
- Step 3: Decide to apply either for dedicated or for shared charging infrastructure funding
- Step 4: Apply for funding within 4 months after application period opens

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# Committed EV Purchaser

Note: MDUs are encouraged to apply for the EV Ready Pilot Program even if they have ***no*** current EV owners or Committed EV Purchasers.

What is a "Committed EV Purchaser?"

- ❑ Agrees to be charged refundable $250 deposit on electric bill if their MDU is selected to receive engineering design services through the EV Ready Pilot Program
- ❑ Receives $250 credit on electric bill if EV charging infrastructure is installed at the MDU and the committed EV purchaser provides proof of EV ownership to CMLP within 6 months of **charging infrastructure completion**.
- ❑ The MDU property owner/manager may choose to serve as a proxy "Committed EV Purchaser" by agreeing to be charged one or more refundable $250 deposits on a common area electric bill.

# Other EV Resources

- Tools developed during EV Ready Pilot Program will be made available to all MDUs
  - Customizable specifications for each parking area type
  - Project cost estimator tool
- Free EV Support Line/Email: 833-433-8363/ev@ene.org
- Online resources: ConcordDrivesElectric.org
- CMLP's Shared Charger Program

Concord Drives Electric
ConcordDrivesElectric.org

# CMLP Shared Charger Program

- CMLP will install, own, and operate one dual-port shared charging station on MDU property, subject to conditions:
  - Location of charging station is near electrical delivery point
  - MDU provides CMLP with easement for area where wiring from delivery point and charging station are located
  - At least 7 MDU residents are committed EV purchasers; MDU may serve as a proxy "committed EV purchaser" by making refundable $250 deposits itself.
- MDUs may not participate in EV Ready Pilot Program and Shared Charger Program simultaneously
- Value received through Shared Charger Program will reduce financial assistance to MDU from any future EV Ready Program

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# MDU Charging Programs

| | Ownership | Benefits | Requirements/Costs | Deadline to Apply |
|---|---|---|---|---|
| EV Ready Pilot Program | Dedicated Charging: Common area infrastructure owned and operated by MDU<br><br>Shared Charging: Owned and operated by MDU or CMLP | ✓ Free engineering plans/specs<br>✓ Help deciding between dedicated/shared<br>✓ Budget and adoption forecast to prepare for the future of EV charging<br>✓ Financial assistance for installation<br>✓ Electric rate incentives for MDU residents | ❑ 5 or more living units<br>❑ Dedicated Charging: On-bill TOU rates<br>❑ Shared Charging:<br>  ❑ CMLP ownership required to receive installation incentives<br>  ❑ Public rates apply thru charging station vendor | December 10th |
| Shared Charger Program | Owned and operated by CMLP | ✓ Low-maintenance option for MDU<br>✓ No upfront investment | ❑ Locate charging station near electrical delivery point<br>❑ MDU provides CMLP with easement<br>❑ At least 7 EV owners or committed purchasers | Rolling, beginning in early November 2019 |

# For More Information

- EV Ready Pilot Program and Shared Charger Program information & applications available at:
  - concordma.gov/rebates
- Applications for engineering design services due on **December 10th**.
- For questions, discussions or meetings, contact:
  - Jan Aceti, CMLP, jaceti@concordma.gov; 978-318-3151 except from 9/13 - 9/24/19.
  - From 9/13 – 9/24/19, contact Laura Scott, CMLP, 978-318-3102, lscott@concordma.gov;

# Things to Know About Dedicated Charging in Multi-Dwelling Units

| THE GOOD | THE BAD | THE UGLY |
|---|---|---|
| Same user experience and convenience as for residents in single-family homes.<br><br>EV can be charged whenever it is parked. | EV drivers have to research/purchase personal EV charging equipment. | Installation of personal EV charging equipment requires consent and coordination with MUD managers. |
| Once common area wiring is in place, the charging equipment needed by each individual EV owner is quite inexpensive. | Personal EV charging equipment requires some installation or upgrades to wiring that crosses common areas.<br><br>MUD managers typically do not know the technical requirements or cost of the common area electrical infrastructure needed to enable personal EV charging.<br><br>Non-EV drivers do not want to incur costs of common area infrastructure to accommodate EV drivers. | The requirements for common area electrical infrastructure are perceived to be excessively difficult or expensive. This perception discourages research on options to enable EV charging. |
| A gradual increase in the number of EV owners, from only a few initially to significant numbers by 2025, allows some phasing of common area infrastructure installation work and cost. | Planning for charging needs of EV owners who grow in numbers over many years adds complexity.<br><br>Consent and coordination by MUD managers regarding installation of personal EV charging equipment becomes an ongoing responsibility. | While consensus is that EV ownership will increase over time, there is uncertainty about how fast.<br><br>One-time projects like shared chargers are easier to understand than phased projects involving forecasts for charging capacity needs. |
| CMLP is analyzing infrastructure requirements and creating planning tools that will be available to MUDs. | Work and cost involved in planning and installing common area infrastructure can be substantial. | Installing common area infrastructure all at once can minimize overall costs but requires unplanned funding. |

# Things to Know About Shared Charging in Multi-Dwelling Units

| THE GOOD | THE BAD | THE UGLY |
|---|---|---|
| Sharing an initial installation can inexpensively meet the needs of multiple drivers<br><br>Individual drivers do not need to research/buy personal equipment. | Usually, new EV owners purchase and install personal equipment. Shared charging shifts cost to EV and non-EV drivers.<br><br>Not as convenient as for drivers in single-family homes.<br><br>Must move car for charging (at potentially inconvenient times) | Cost of equipment is low only when shared by many drivers.<br><br>However, while a high level of sharing leads to the lowest cost, it maximizes inconvenience. |
| Installing one or more shared charging stations is a simpler way for MUD managers to provide EV charging to MUD residents than installing dedicated charging infrastructure.<br><br>MUD managers can contract responsibility for managing EV charging to third-party<br><br>Charging equipment can be acquired by a lease or service contract, thus avoiding a large initial expense. | Must accommodate other driver's schedules.<br><br>Not guaranteed to have EV charged when needed.<br><br>For drivers that work, how many EVs can be charged when they return home and be ready for the next day?<br><br>Will drivers need to move their cars between 11pm and 5am to enable everyone to be charged up to drive to work the next morning?<br><br>There is no free lunch. MUD residents or all CMLP customers will pay for equipment one way or another, depending on how the cost is captured by the equipment provider. | What are the rules for fair access?<br><br>Who will enforce the sharing rules?<br><br>Shared charging equipment requires network services (and fees) in perpetuity. |
| Avoids need for MUD managers to plan/coordinate installation work in response to each new EV owner's needs. Start with small initial installation and delay additional capacity for future | More and more users sharing each station results in more inconvenience. | Uncertainty about MUD manager's commitment to install additional capacity may reduce MUD's marketability.<br>How do drivers trigger installation of additional capacity when the inconvenience is too high? |

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Questions?