

EV Charging for Condos, Co-ops and Townhomes



EV Charging Webinar

Presenter: Brian Booher, Senior Planning Special – Zero Emissions Vehicles

Audience: Condo boards, HOAs, management companies, and residents of common ownership communities

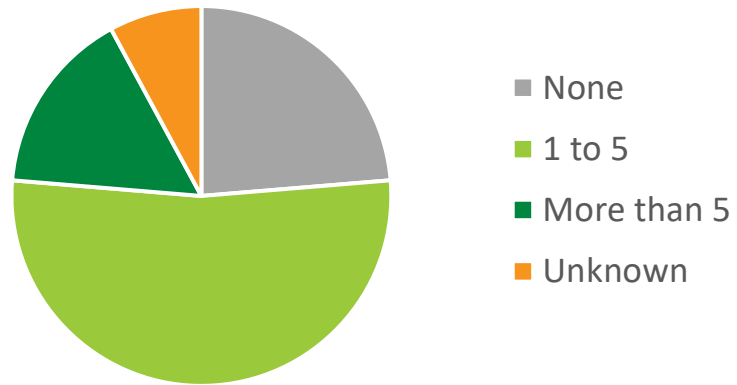
Purpose: Provide information for communities to confidently install EV charging and address key questions

This webinar will help you understand:

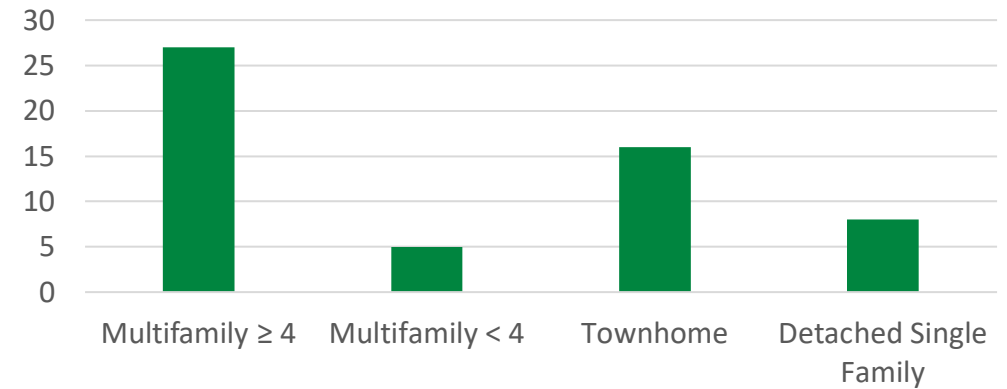
- Types of EV charging and what is right for your community
- Process for planning and executing a project
- Ways to engage your residents and management
- Project costs and incentives
- How to manage charger use and parking

Survey Responses

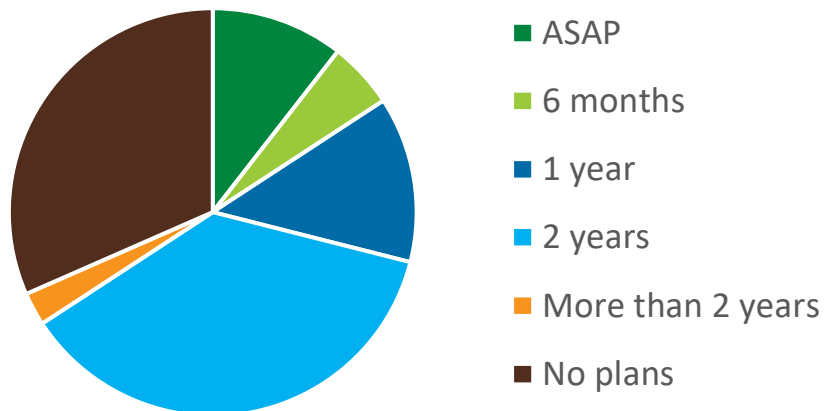
How Many EV Drivers in Your Community?



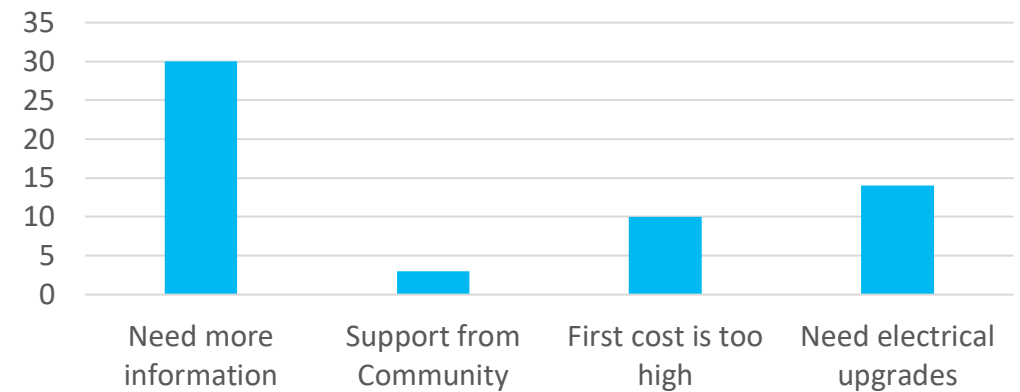
Types of Buildings



How Soon Would You Like to Install Charging?



Barrier to Installation



Why Electric Vehicles?



Zero tailpipe pollution and 50% lower lifecycle GHG emissions



Lower cost of ownership and incentives



Instant acceleration, smooth driving, and modern features



Convenient charging at home



EVs are coming, fast

- Plug-in vehicle registrations in Montgomery County up 60% in 2 years
- 9% of new vehicles in the county are fully battery electric or plug-in hybrid
- Demand is outpacing supply, expect faster growth over next few years

EV Charging 101

There are three types of **Electric Vehicle Supply Equipment (EVSE)** that vary by charging speed as well as power requirements and installation cost.

Level 1

- Plug-in standard 120V outlet, 15-20 amps
- ~5 miles per hour
- Meets needs if you drive 30-40 miles daily

Level 2

- 220-240V and 30-50 amps (hardwire or plug)
- ~25 miles per hour
- Typically used for 4-6 hour sessions

“Smart” or “networked” equipment manages payment and access

Level 3 (DC Fast Charging)

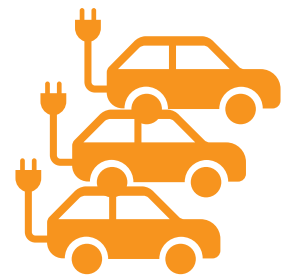
- 480V 3-phase AC input and range in power output, 50-250+ kW
- Public charging locations with high usage
- Fully charge in 30 minutes or less, but more \$\$
- Frequent fast charging is not recommended for battery maintenance

EV Charging is SAFE when installed and operated correctly

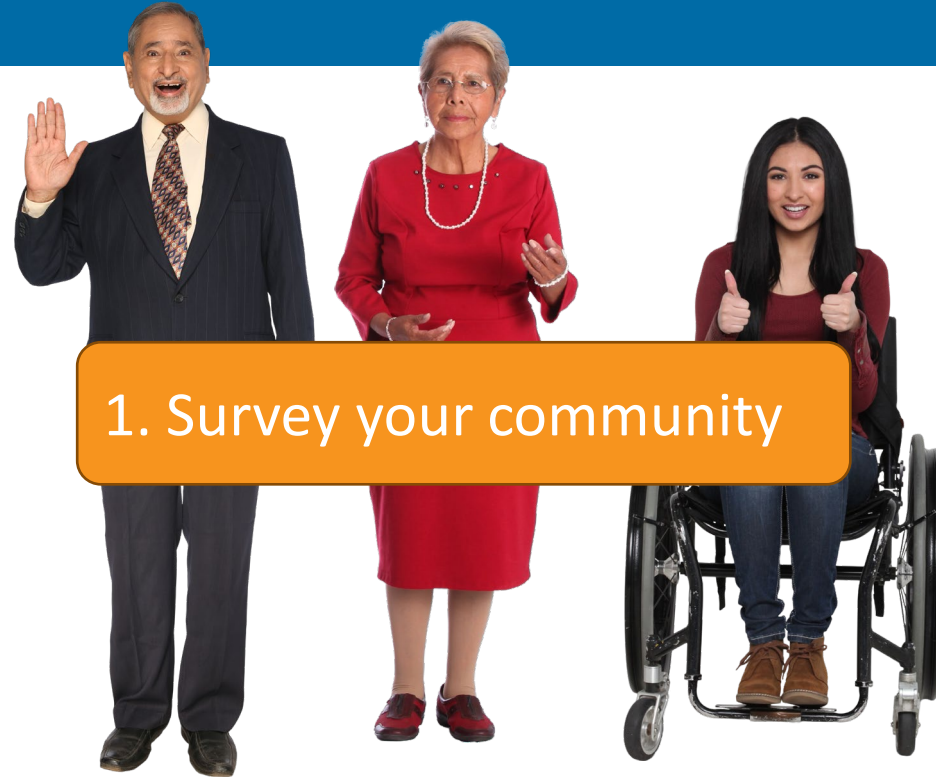
6 Keys for COCs

1. Every property is different – projects need to be customized
2. Engage your community to understand needs and secure support
3. Develop a proactive plan and guidelines
4. Apply for a commercial permit and follow all regulations to ensure safety
5. Plan and budget for ongoing management and maintenance
6. Use technical and financial assistance from the County, your utility, and the Green Bank

Typical Project Steps



Community Engagement



1. Survey your community



2. Work with management

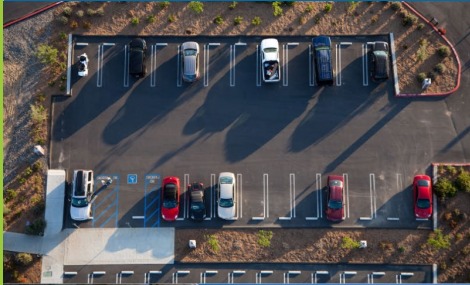


3. Advocate and educate

Shared vs. Private Charging

	Shared Chargers	Private Chargers
PROS	<ul style="list-style-type: none">• Install fewer chargers• Increase general value of property• Manage access and charge for usage	<ul style="list-style-type: none">• Exclusive access• No competition with general parking• Increases the value of the unit/parking space
CONS	<ul style="list-style-type: none">• More persuasion and HOA vote• No on-demand availability for all• Networked chargers add cost• Need to enforce restrictions	<ul style="list-style-type: none">• Higher install cost per charger• No backup if charger/circuit stops working• Early adopters use spare electrical capacity

Location and Future Planning



Where to install?

- Depends on type of parking
- Convenience vs. competing needs
- Distance to electrical service
- WiFi or mobile network signal

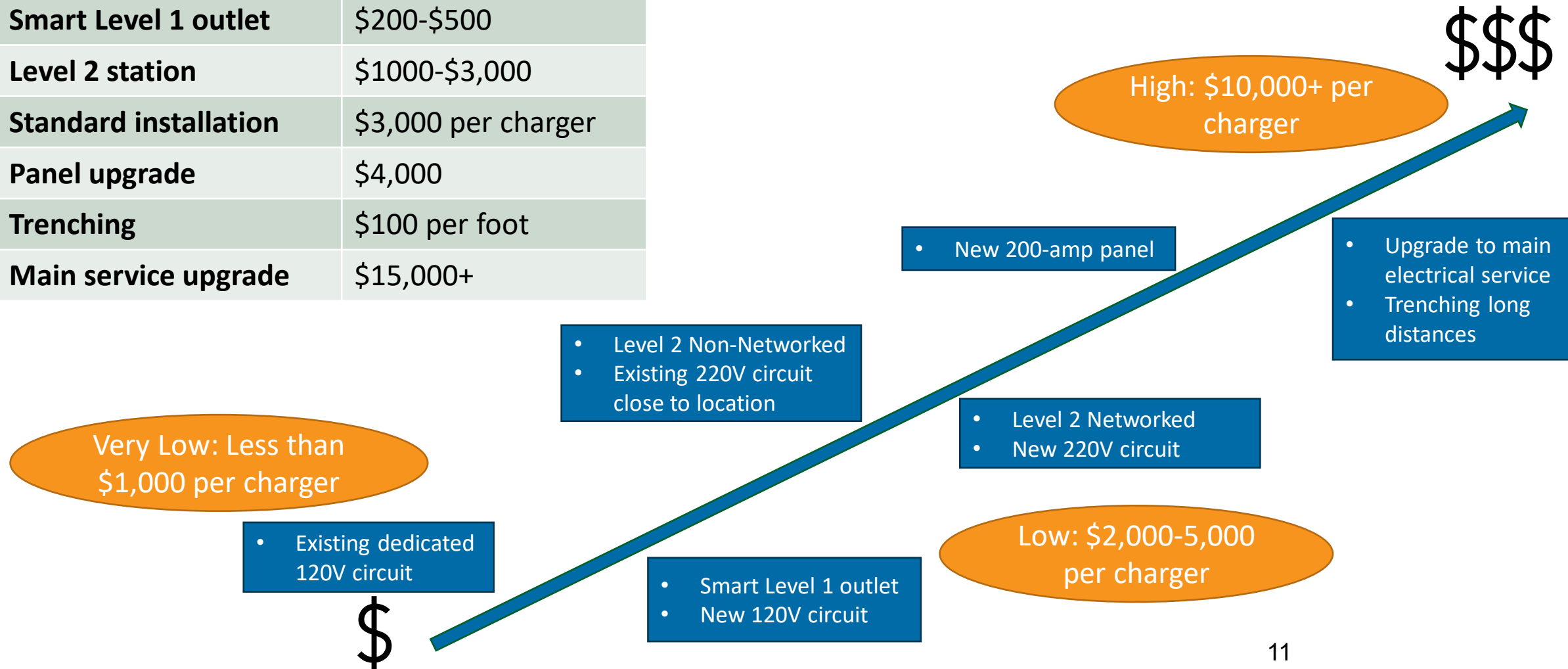
How many chargers to install?

- Constrained by available capacity for the property and subpanel
- Each Level 2 charger can serve up to 3 vehicles
- 10% of vehicles may be electric in 5 years
- “Make ready” electrical work can reduce future costs

Up-front Project Costs

Typical Costs (Actual Will Vary)

Smart Level 1 outlet	\$200-\$500
Level 2 station	\$1000-\$3,000
Standard installation	\$3,000 per charger
Panel upgrade	\$4,000
Trenching	\$100 per foot
Main service upgrade	\$15,000+



Incentives and Financing



Maryland
Energy
Administration



Montgomery County*
GreenBank

Your partner for clean energy

- At least 40% of installation and equipment, and more when combining state and utility rebates
- Low-cost financing can provide a bridge until rebate arrives
- Programs can help you select eligible equipment and find contractors
- Utility programs are limited to eligible multifamily building types



An Exelon Company



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Charging Experience and Management

Recurring Costs



- Network fees (\$40-60 / month)
- Utility rates and demand charges
- Maintenance plan

Maintenance



- Charging cords
- Connection issues
- Cleaning
- Tripped circuit

Managing Access



- Parking signage and enforcement
- Registered users
- Charging for usage
- Reservations

Resources

Information and Tools	Montgomery County ZEV	Learn about Zero Emission Vehicle technology and make the pledge to join the EV Purchasing Co-op
	Maryland EV	More information about EVs and EV charging from the State of MD
	U.S. Dep. of Energy	Research and resources for multifamily property owners and residents from the Alternative Fuels Data Center
	VCI-MUD.org	Survey and communication templates, technology guides, and more for multifamily residents, HOAs, and property owners
Incentive Programs	MEA EVSE Rebate Program	40% of the cost of equipment and installation up to \$4,000 per charger
	Pepco EVSmart	100% of the cost of eligible equipment, 50% of network cost, and 100% of installation up to \$15,000 per charging station.
	BGE EVSmart	50% of the cost of equipment, warranty, and installation. \$5,000 per 2 charger, up to \$30,000 for each commercial property
	Potomac Edison EVDriven	50% of the cost of equipment and installation
	Federal EV Tax Credit	Up to \$7,500 tax credit for certain new EV models and \$4,000 for used electric vehicles, depending on household income

We want to hear from you!

1. What challenges have you encountered?
2. What kind of assistance would help?
3. What programs and strategies would make the County a better place to buy, own, and charge an EV?

Contact Us

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Permits & EV Charging

Electrical Manager: Anthony Toussaint

Sustainability, Energy, and Mechanical Manager: Bryan Bomer



DPS | Montgomery County
Department of Permitting Services

YOUR PROJECT PARTNER

Commercial Permitting Process



DPS

Montgomery County
Department of Permitting Services

YOUR PROJECT PARTNER

- Application
 - Fees
- Screening
 - What to submit: drawings and support documents
 - All submittals are required to be signed and sealed
- Review disciplines
 - Architectural-life safety: location of chargers in respect to pathways
 - Electrical: equipment specifications, line diagrams, load calculation
 - Structural: mounting
- Permit issuance
 - Building permit
 - Electrical permit: trade permit pulled by electrician
- Inspections
 - Rough inspection and final inspection

Important Points to Consider



DPS

Montgomery County
Department of Permitting Services

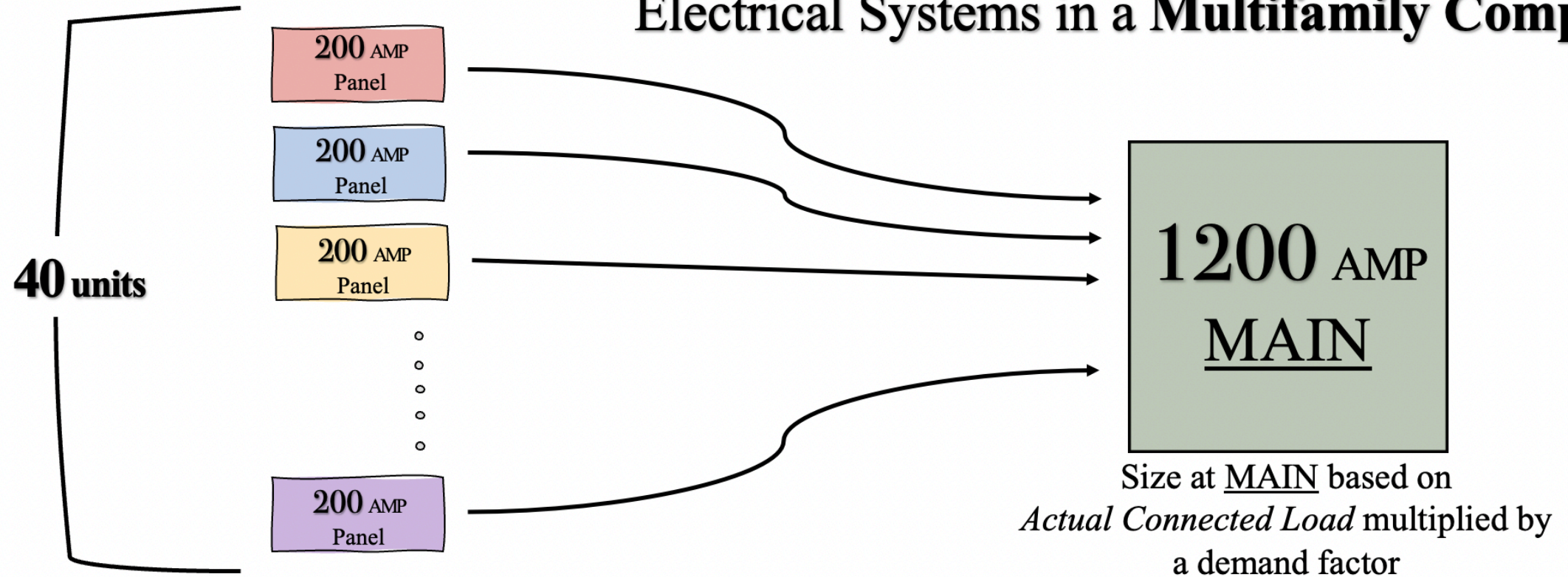
YOUR PROJECT PARTNER

- Evaluation of existing system
 - Professional: licensed electrical engineer
 - DPS can not provide recommendations
 - DLLR agency manages database of licensed professionals
- Determine what the project wants
 - Now vs Future: Communication between COC and design team
 - Budget: this is not linear!
 - Charging power limitations
 - Total system power vs individual unit power

Common Issues

- Total amperage of all chargers exceeds electrical system design maximum
- Structural changes needed to parking structures due to mounting
- Egress paths impacted by charging station locations and accessibility considerations of parking areas
- COC site and use permission responsibilities:
 - First come first served
 - Full evaluation of the electrical system is needed for each new request
 - Prioritization of parking spots
 - Cost impacts on property

Electrical Systems in a Multifamily Complex



Example from NEC 2017 Handbook page 1229

=> 40 x 200 AMPs = 8000 AMPs ❌

=> *Actual Calculated Connected Load* = 880,000 VA

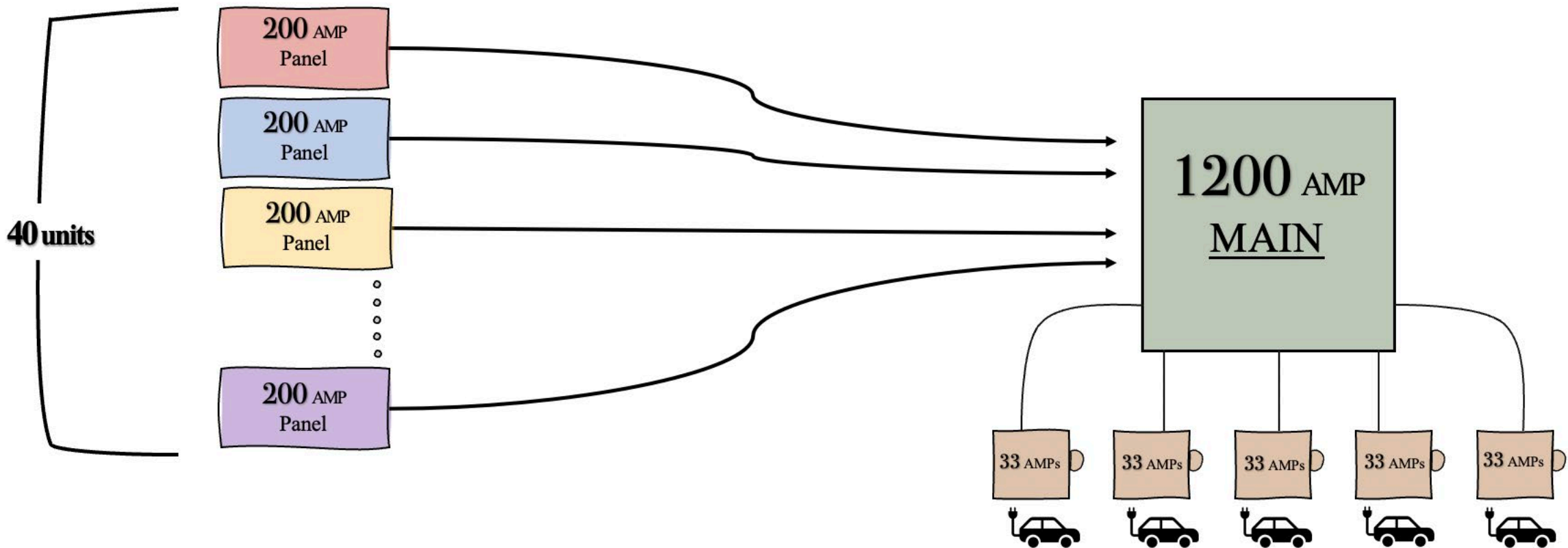
Calculated AMPeres = $\frac{880,000 \text{ VA}}{240 \text{ V}} = 3667 \text{ AMPs}$ ❌

Optional Method per NEC

=> Demand Load = 880,000 x 0.28 = $\frac{246,000 \text{ VA}}{240 \text{ V}}$

$\frac{246,000 \text{ VA}}{240 \text{ V}} = 1026 \text{ AMPs}$

Next Standard Overcurrent Device = 1200 AMPs ✓



Spare Capacity \Rightarrow 1200 AMPs – 1026 (Actual Calculated Load)
 \Rightarrow 174 AMPs (Spare Capacity)

Level 2 Charger approximate load = 33 AMPs

Number of Level 2 EV Chargers can then be installed without a service upgrade.

$$\Rightarrow \frac{174 \text{ AMPs}}{33 \text{ AMPs}} = 5.2$$

FIVE Level 2 EV Chargers can be installed at present capacity

Questions?



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