



# EV Ready Code

March 17, 2021

# Purpose of EV Ready Code



**Market projections** show that by 2030, nearly 30% of registered vehicles in Orlando will be powered by electric –manufacturers have shifted and demand is rising



Preparing a parking site for future installation of EVSE (Electric Vehicle Supply Equipment) **saves significant amounts of money** compared to retrofitting the property later



**Over 80% of charging** occurs at home or work



**Zero tailpipe** emissions improve air quality and public health. City Council has adopted goals to reach **90% GHG emission reductions by 2040**

# Why is electric vehicles and mobility good for our community?

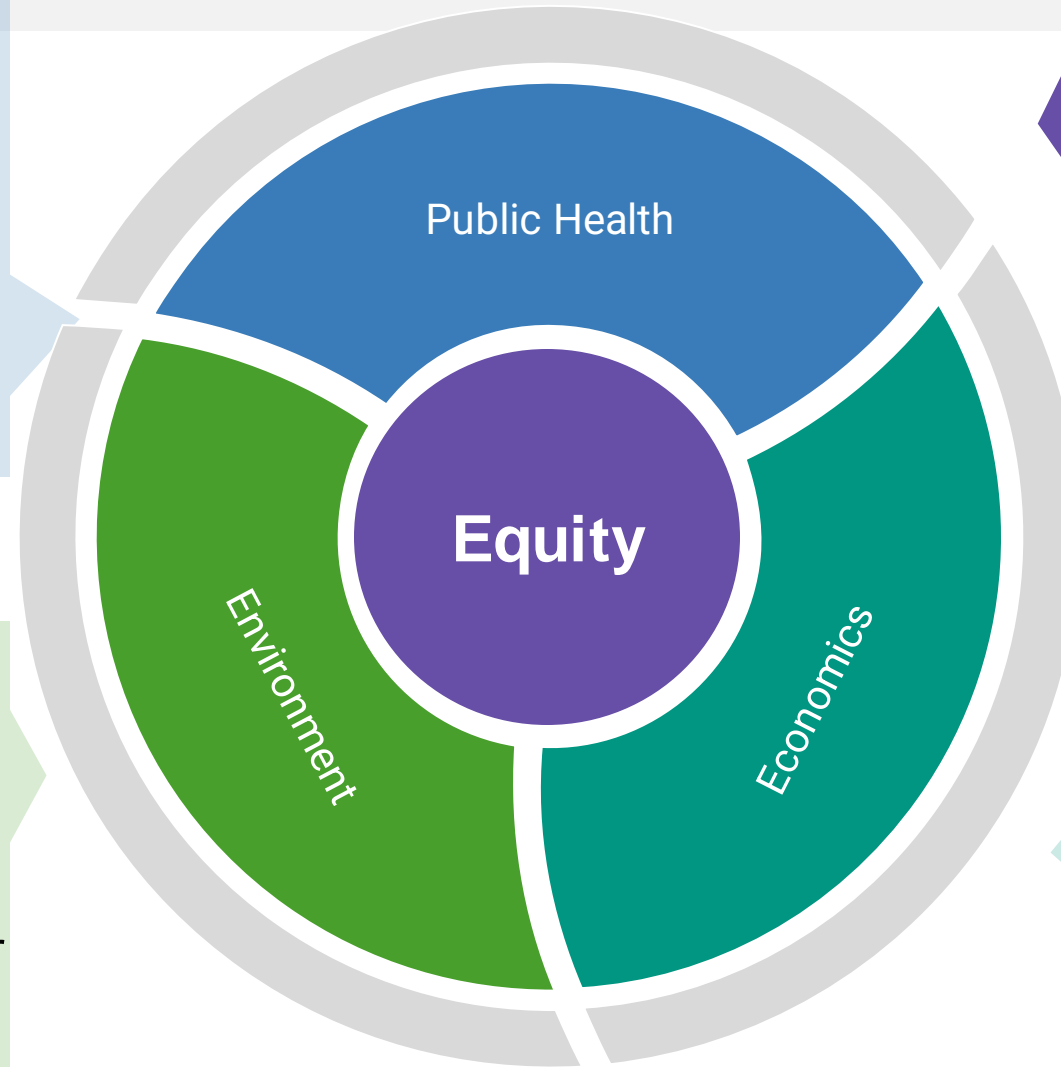
## Public Health:

Vehicles contributing **85% of carbon monoxide (CO) emissions** and **73% of nitrogen oxides (NOx)** in Orange County

## Environment:

City goal: **90% GHG reduction by 2040**

Gas and diesel account for **20% of the City's GHG emissions**



## Equity:

- *Ensuring health and economic benefits accrue to those most impacted by transportation pollution historically*
- *To reach our climate goals, we need everyone, particularly diverse communities!*

## Economics:

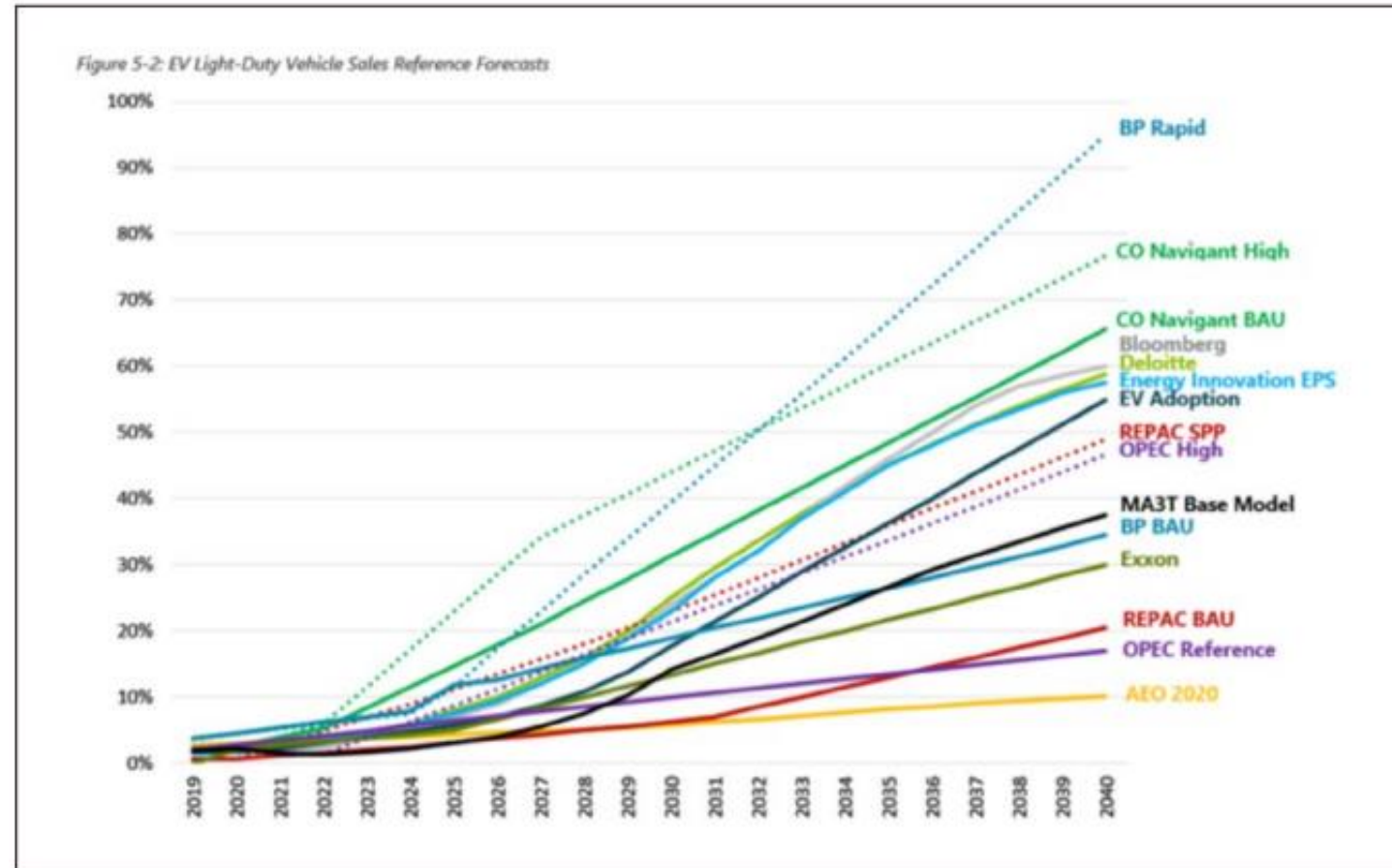
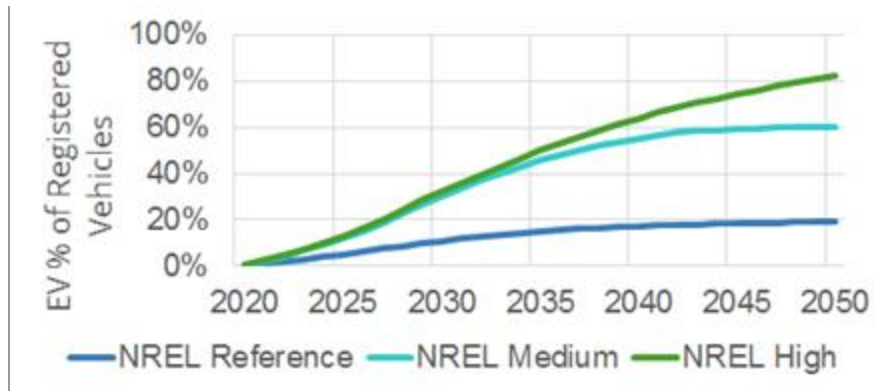
Total cost of ownership *now* favors electric vehicles

- Upfront costs
- Operating costs



# Trajectory for electric vehicle (EV) adoption and charging demand...

- By 2025, EV adoption is projected to more than double in the Orlando metro area.
- By 2030, EV adoption is projected to reach 10-30% of registered vehicles, and by 2050, nearly 70%.



Source: FDAC

# Since then, the market has rapidly accelerated towards EV adoption with big commitments



## Biden plans to replace government fleet with electric vehicles

PUBLISHED MON, JAN 25 2021-5:38 PM EST | UPDATED TUE, JAN 26 2021-8:58 AM EST

## General Motors to eliminate gasoline and diesel light-duty cars and SUVs by 2035

Big U.S. automaker says it will invest heavily in electric vehicles and be carbon neutral by 2040



## Lyft vows '100 percent' of its vehicles will be electric by 2030



## Ford is more than doubling its investment in electric and autonomous vehicles to \$29 billion

## Jaguar Land Rover Goes Electric

Jaguar Land Rover will invest \$3.5 billion a year to roll out its first fully electric model by 2024



everybody in.

## Why 2020 Is the Turning Point for Electric Cars

Major auto brands, startups and opportunistic investors are all joining the electric-vehicle the coming EV revolution



TECHNOLOGY NEWS JANUARY 15, 2018 REUTERS

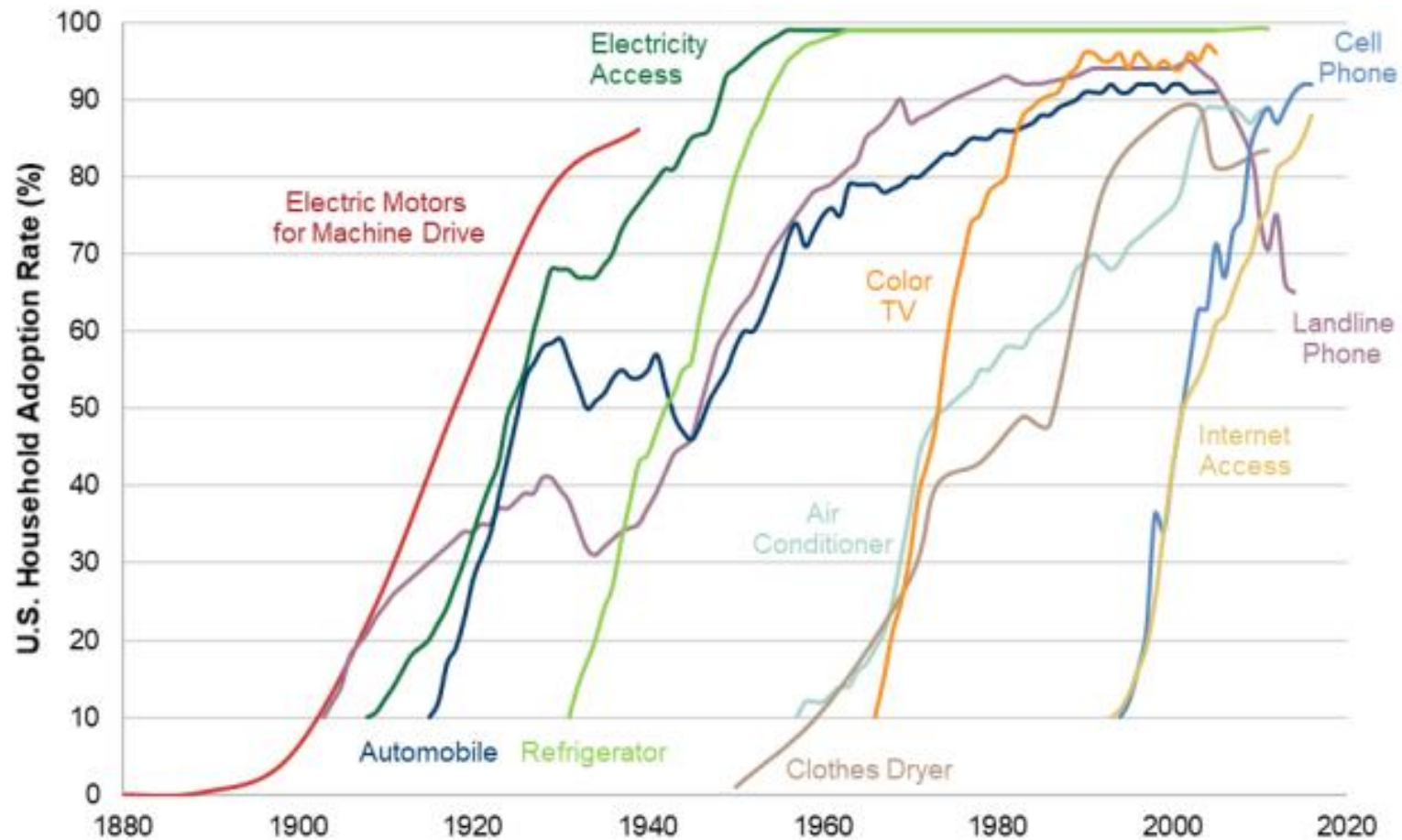
## Global carmakers to invest at least \$1 billion in electric vehicles

## Volvo says it will make only electric cars by 2030



Honda Aims To Go All-Electric By 2040

# History of rapid technology diffusion in the US



**Figure ES-1. Diffusion of various technologies in U.S. households**

Data Sources: Du Boff 1964 in Devine 1983 for electric motors; Ritchie and Roser 2018 for all others



# As you know, electric mobility isn't just personal cars...

## Electric bikes



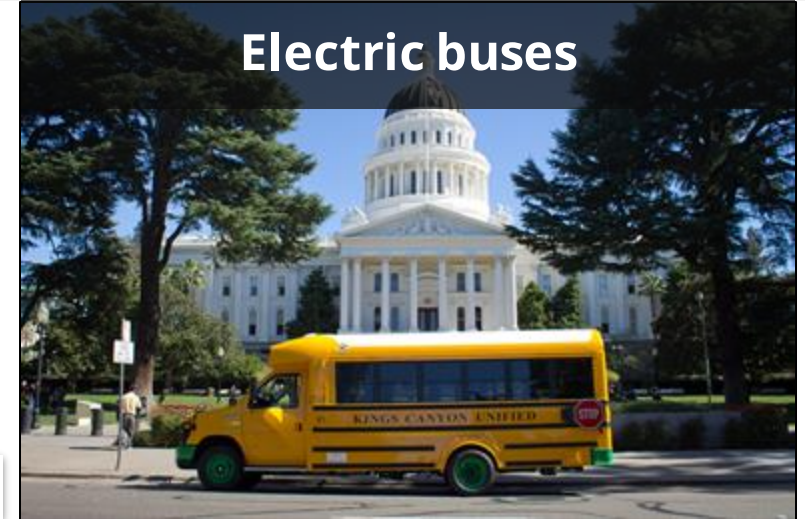
The US is doubling e-bike imports this year to half a million, and even that isn't enough

## Electric delivery



Amazon to Add 100,000 Electric Vehicles

## Electric buses



## Shared electric bikes, scooters, and cars



## Electric freight



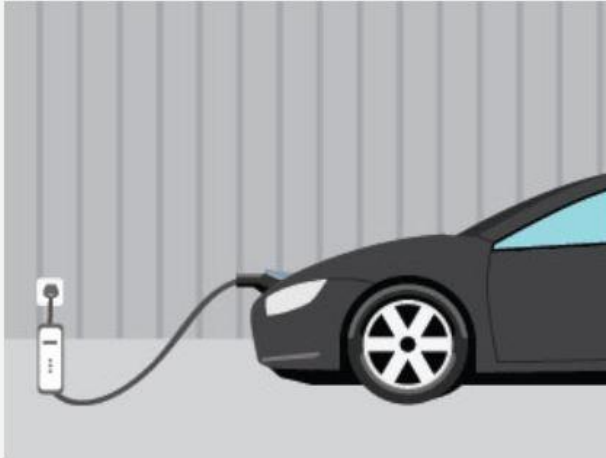
Fifteen states and D.C. pledge 100% zero emission trucks by 2050

## Flying e-taxi



# EV Charging Speeds

## AC Level 1



**VOLTAGE:**

120V 1-Phase AC

**AMPS:**

12-16 Amps

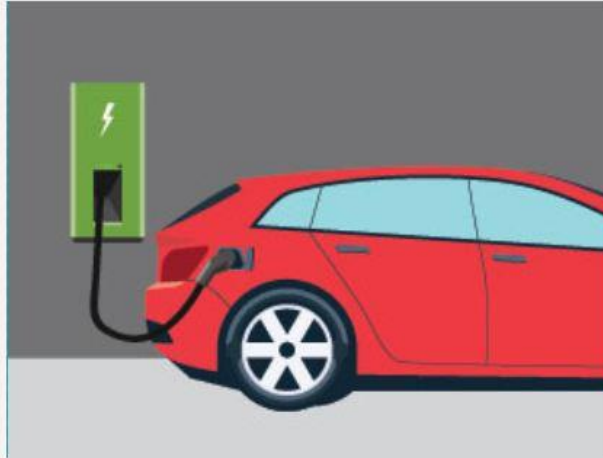
**CHARGING LOADS:**

1.4 to 1.9 kW

**CHARGE TIME FOR VEHICLE:**

3-5 Miles of Range Per Hour

## AC Level 2



**VOLTAGE:**

208V or 240 V 1-Phase AC

**AMPS:**

12-80 Amps (Typ. 32 Amps)

**CHARGING LOADS:**

2.5 to 19.2 kW (Typ. 6.6 kW)

**CHARGE TIME FOR VEHICLE:**

10-20 Miles of Range Per Hour

## DC Fast Charge



**VOLTAGE:**

208V or 480V 3-Phase AC

**AMPS:**

<200 Amps (Typ. 60 Amps)

**CHARGING LOADS:**

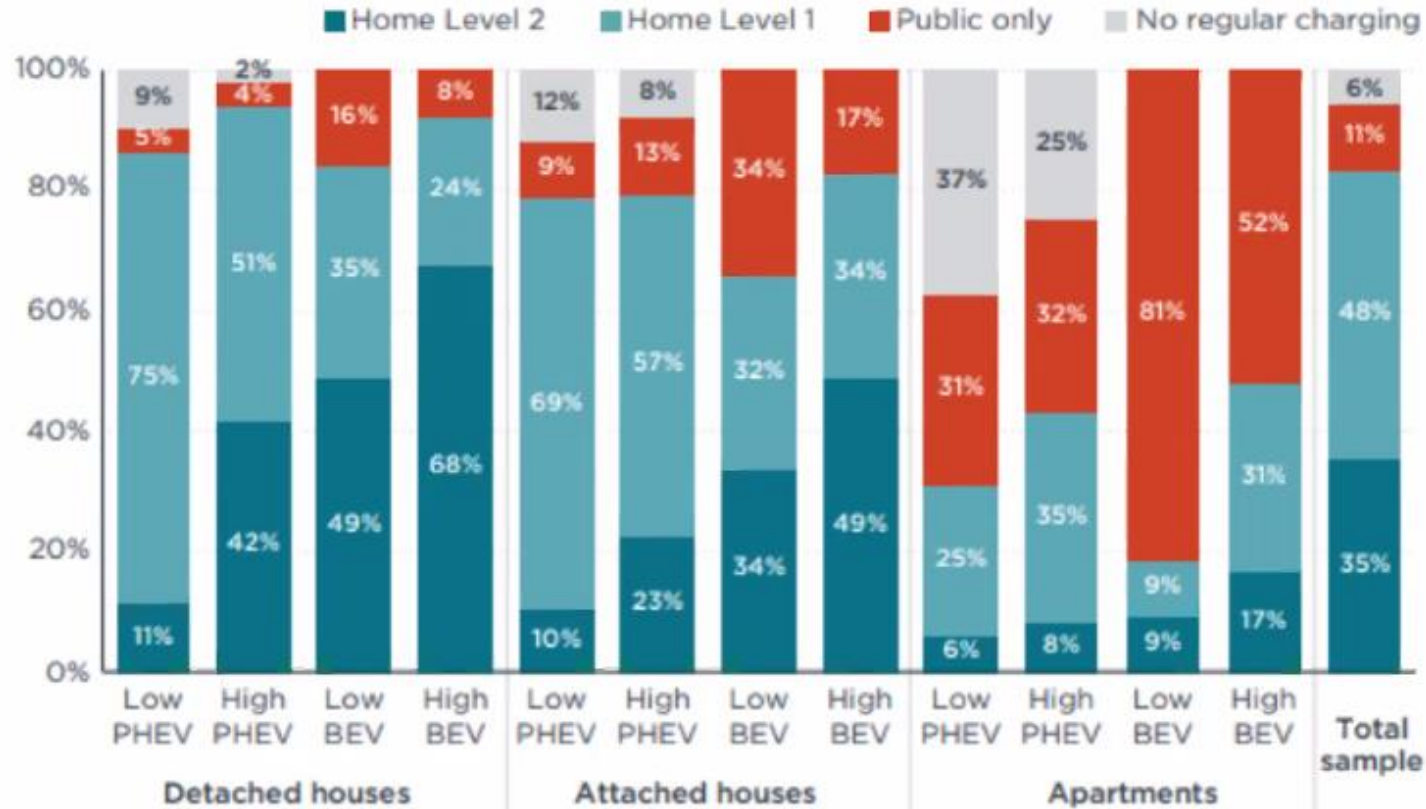
<150 kW (Typ. 50 kW)

**CHARGE TIME FOR VEHICLE:**

80% Charge in <30 Minutes

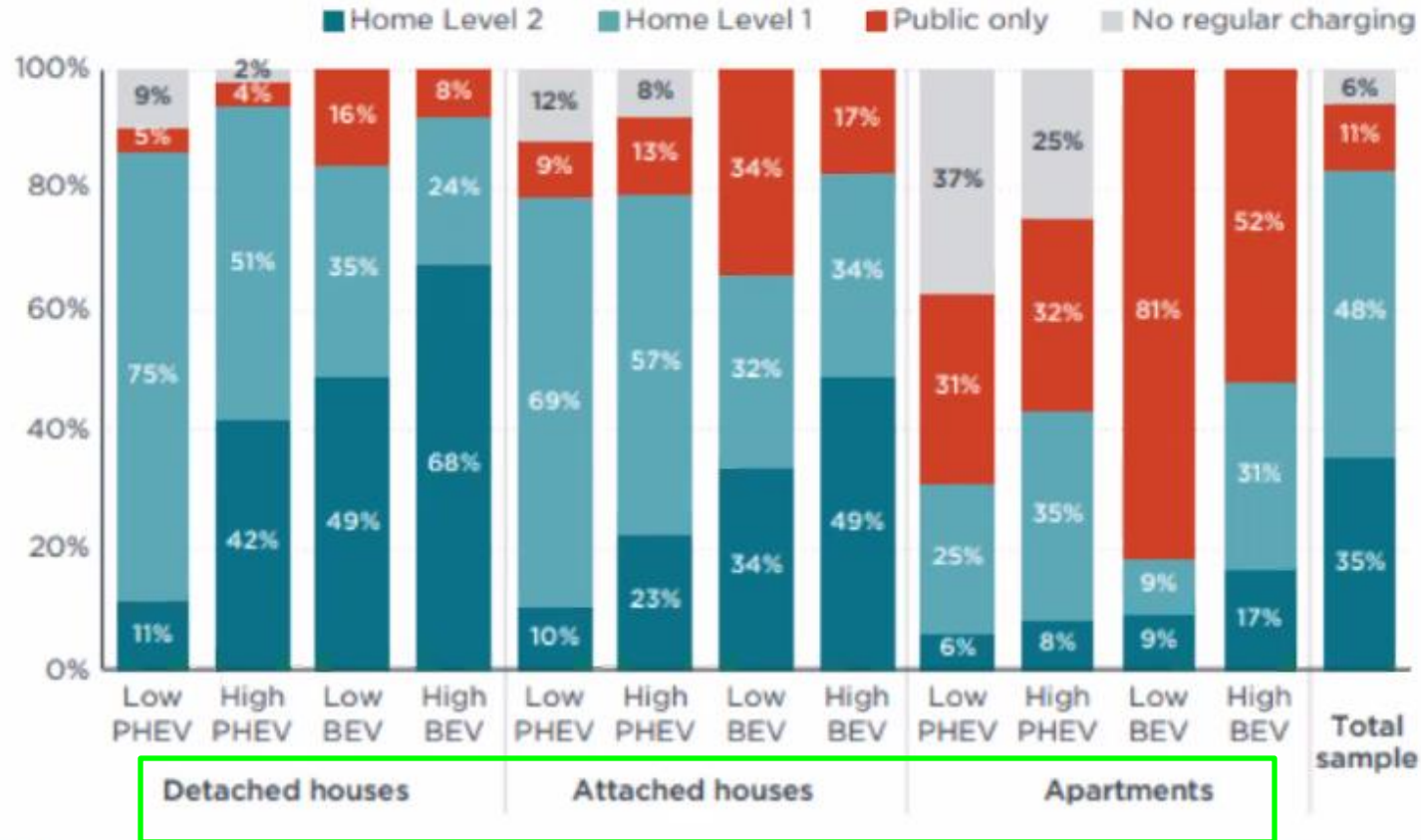


# EV Charging Speeds – Poll: what type do EV owners rely on most?



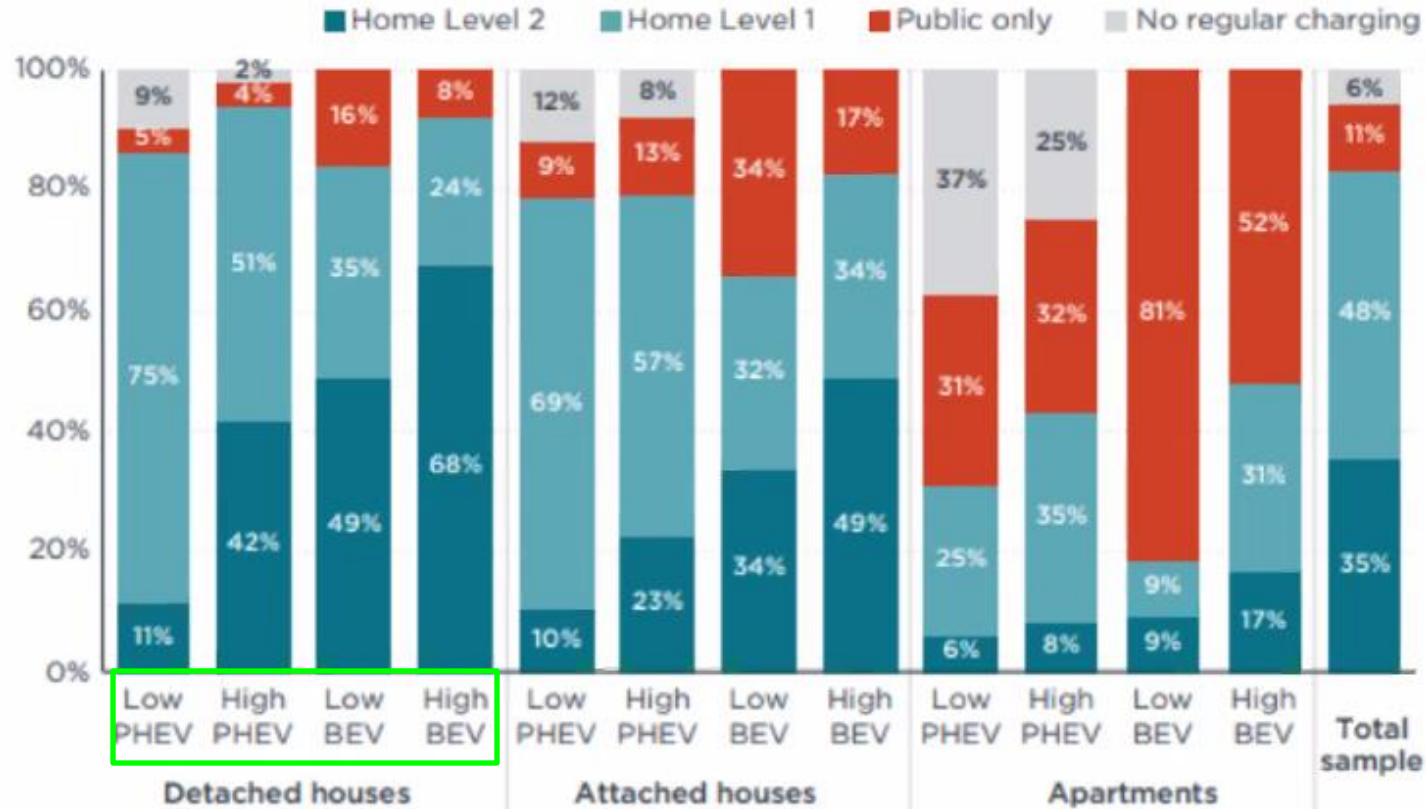
Source: International Council on Clean Transportation, *Quantifying the Electric Vehicle Charging Infrastructure Gap Across U.S. Markets* (January 2019)

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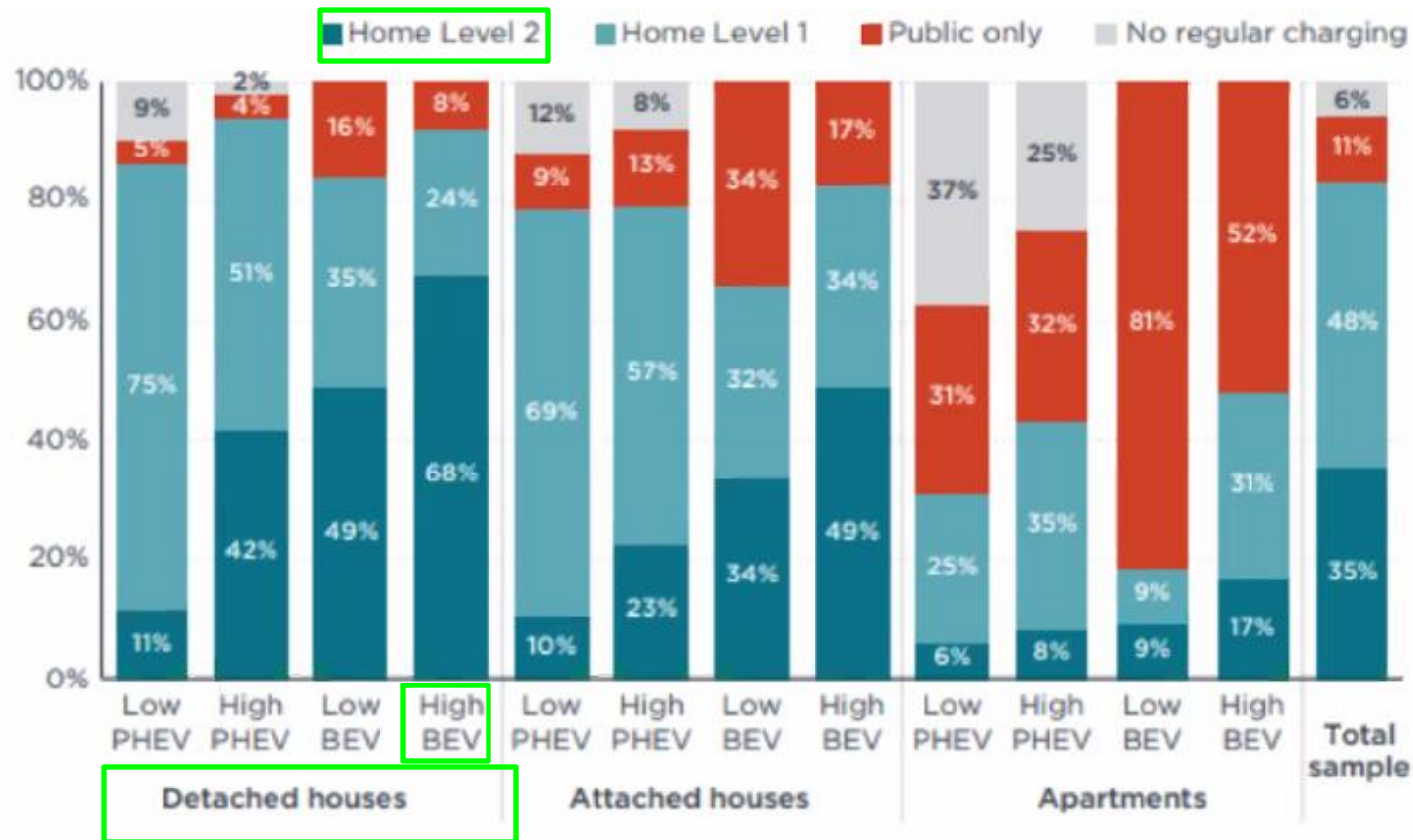
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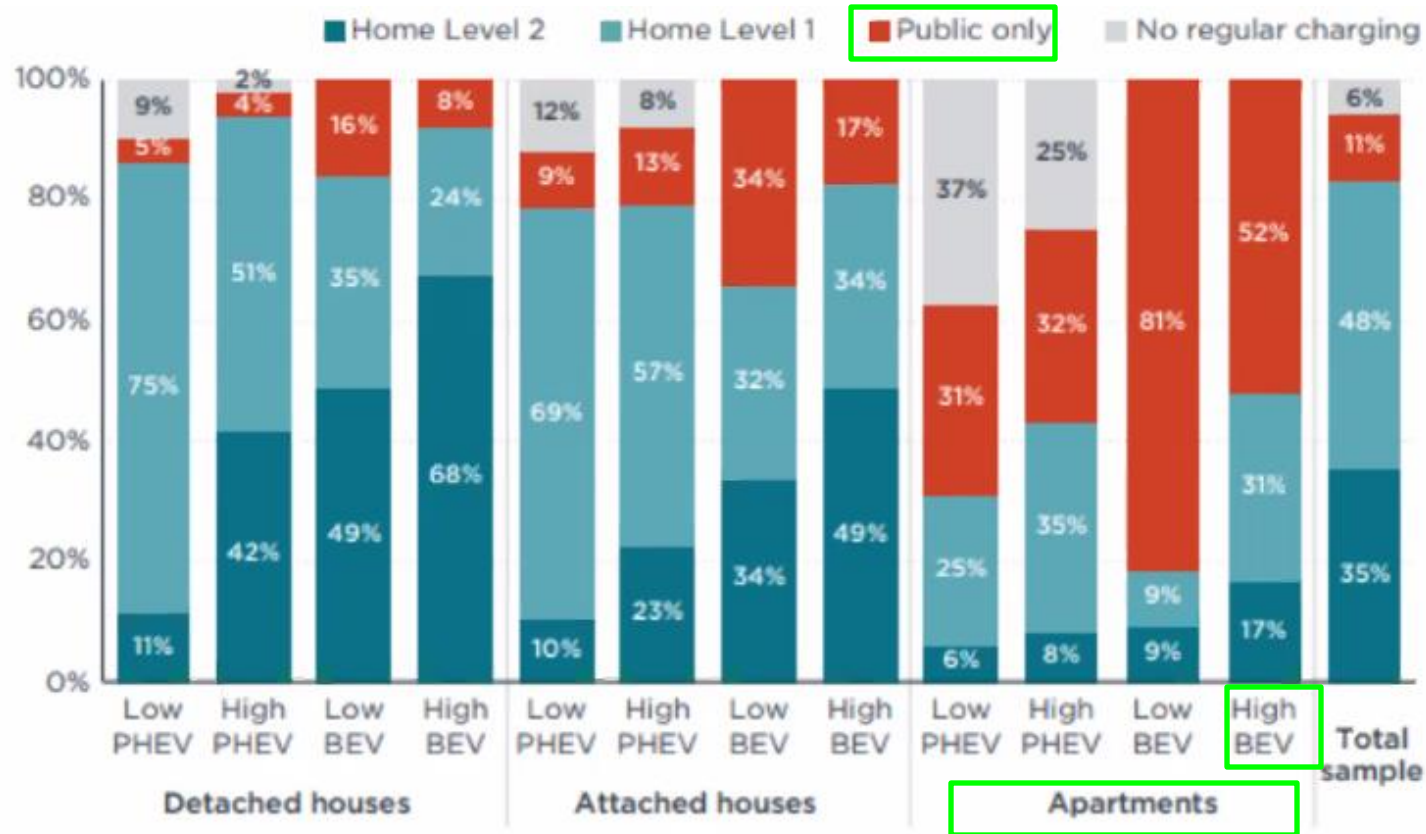


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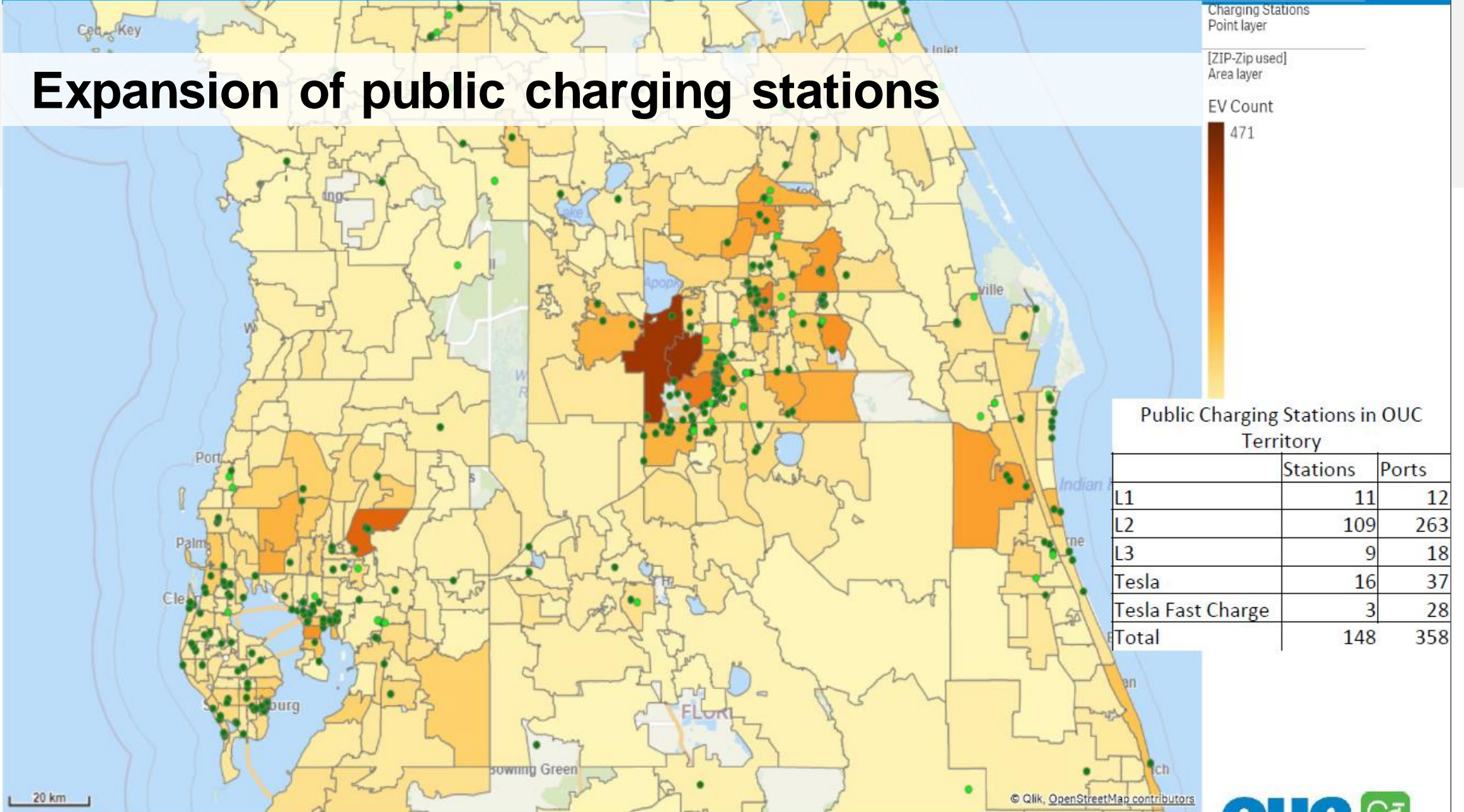
Source: International Council on Clean Transportation, *Quantifying the Electric Vehicle Charging Infrastructure Gap Across U.S. Markets* (January 2019)

# We are creating an e-mobility ecosystem and preparing for a rapid and massive transformation ahead





# Expansion of public charging stations

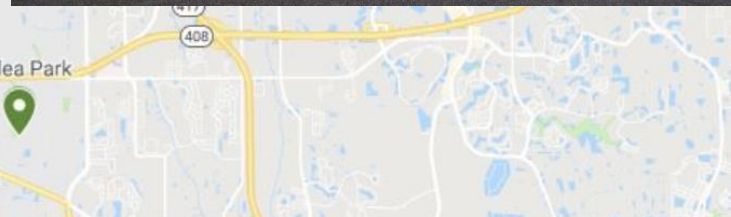


\* Currently showing a limited data set.



EV Charging Locations - City-Wid...  
A map of the recommended locations to implement public facing EV chargers  
94 views  
All changes saved in Drive

# Starting April 2021, the City of Orlando and OUC will be enabling 100+ new Level 2 EV charging stations throughout City parks, Rec centers, parking garages, and more.





# EV Recharge Mobility Hubs



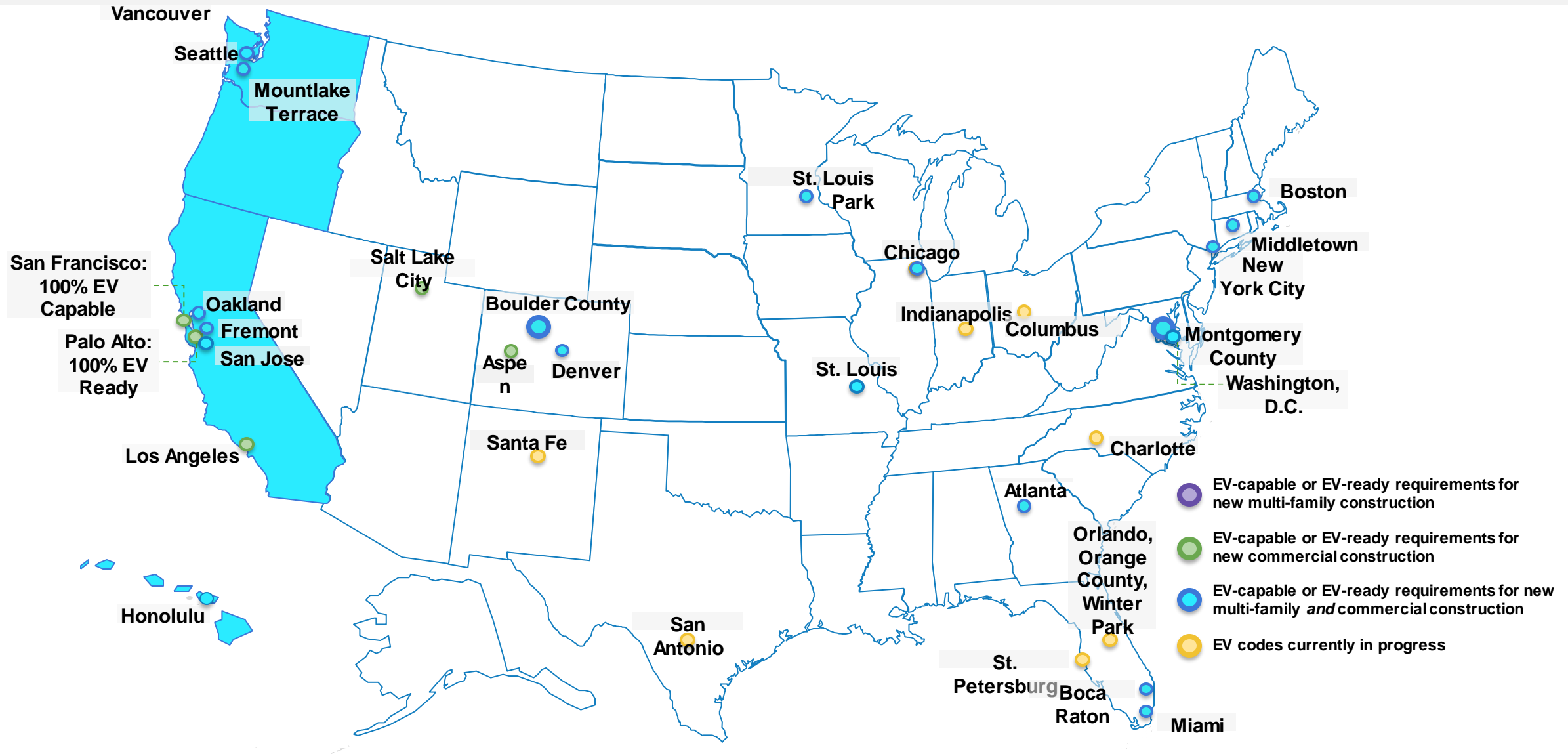


# OUC EV Programs

- **OUC Charge-It:** EV charging station “as-a-service”
- **OUC EV Rebate:** \$200 rebate for purchasing a new EV or PHEV
- **OUC Test Drive:** \$50 VISA giftcard for test driving an EV
- **Electrified Dealership:** Promotes dealerships meeting EV criteria; Financial incentives for sales reps
- **Ride and Drive:** Test drive variety of EVs without the sales pressure



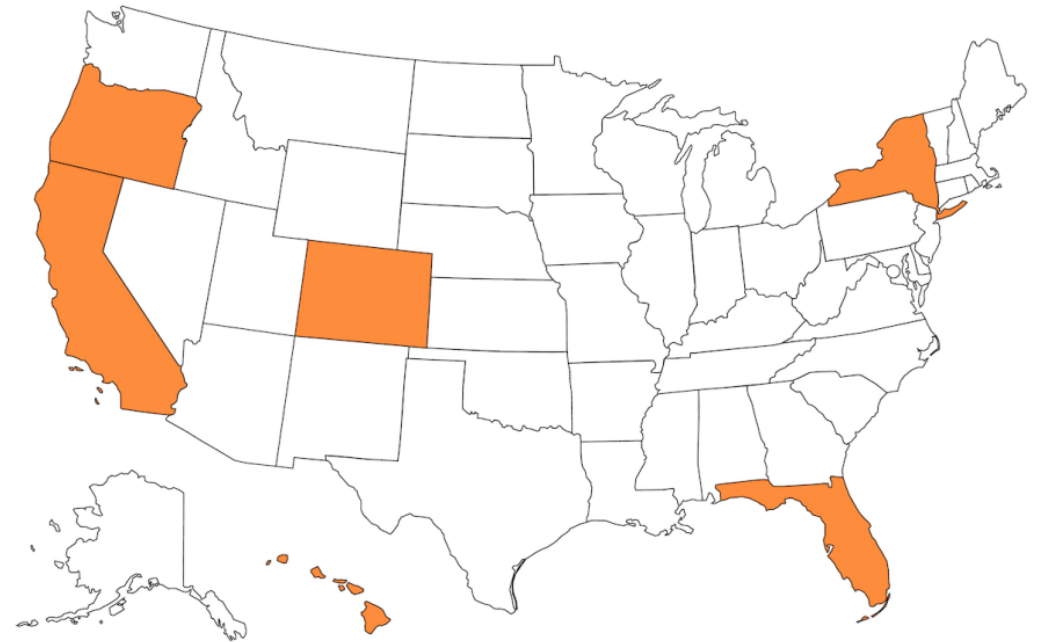
# Last year, we shared how cities across the US are preparing with EV Readiness codes... and heard Orlando is in



# Florida “Right to charge” legislation for condo owners

- As of 2019, Condo associations in Florida may not prevent an owner from installing an EV charging station
- Owners may install an EV charging station at their own cost, and within their designated parking space

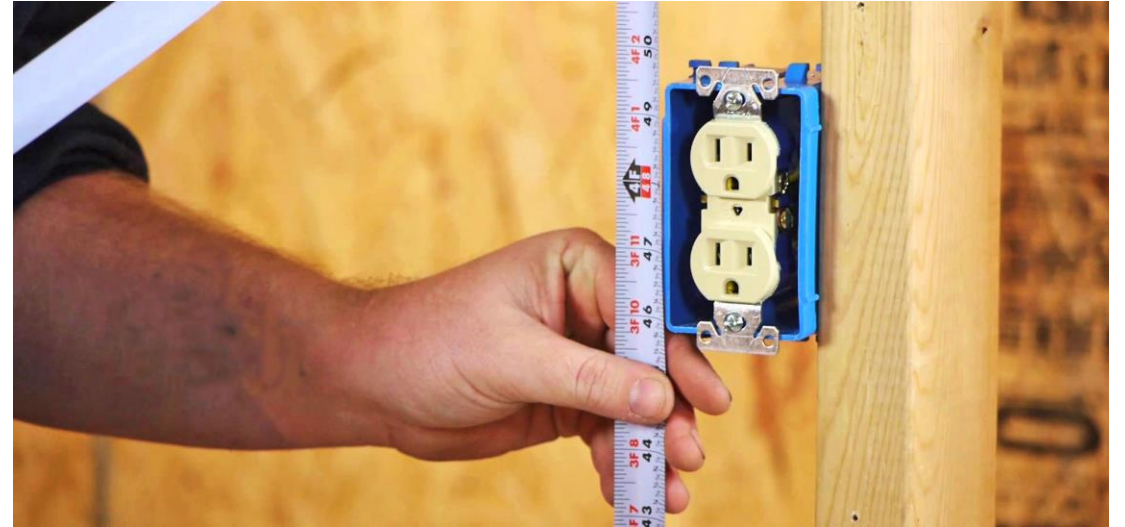
**Florida is one of a few states with this legislation**



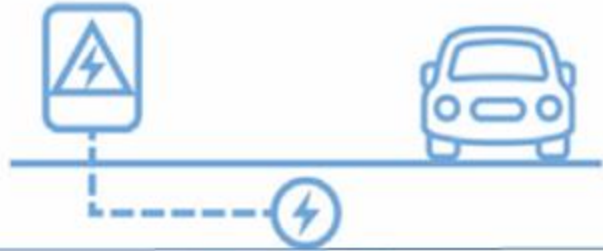


# EV Ready (Level 1) required for all Single-Family Homes

- Florida Building Code requires 120V outlet for every vehicle in the parking garage.
- Level 1 EV Ready – 3-5 miles per hour of charging
- Provides opportunity for EV's to “trickle charge” their vehicles



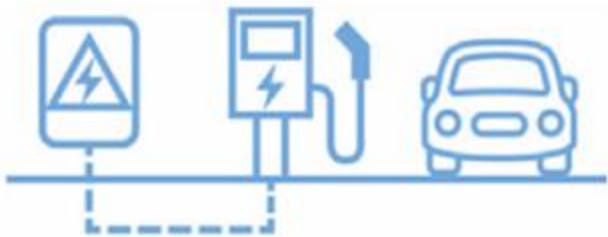
# Three tiers of EV Readiness



**EV Capable:** Install electrical panel capacity with a dedicated branch circuit and a continuous raceway from the panel to the future EV parking spot.



**EV Ready:** Install electrical panel capacity and raceway with conduit to terminate in a junction box or 240-volt charging outlet (typical clothing dryer outlet).



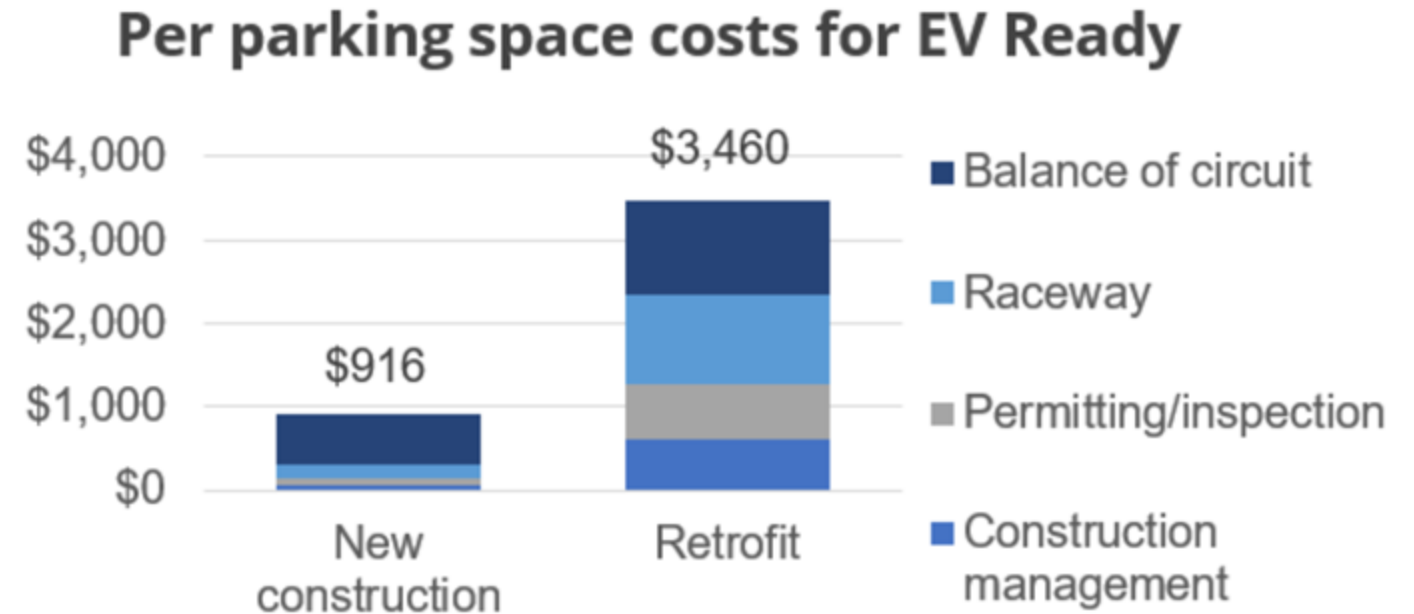
**EVSE Installed:** Install a minimum number of EV charging stations ([min. 32A](#))



# Avoided costs – new construction vs. retrofits

Costs to make parking EV ready during construction are typically small, but can be very expensive for building owners and tenants to install EV charging later –EV readiness typically **saves around 75% compared to retrofit costs.**

**0.13%-0.17% of project costs** in one study of new construction multi-family and commercial projects



*Case study of a multi-family or commercial parking lot with 10 spaces, 2 of which would be EV-ready*



# We have engaged stakeholders, drafted code, negotiated requirements:

Stakeholder outreach: Apr '20-Jan '21

- BOMA, GOBA, NAIOP, AAGO, FHBA
- NAACP, Sierra Club, League of Women Voters, Clean Cities Coalition

Multiple surveys:

- Proposal in general (18)
- Proposed language (5-17)
- Proposal revisions (2)

Iterative feedback process:

- Revisions, clarifications, and facts shared





## Certified Affordable Multi-family Housing

### Real Orlando Example – illustrates EV Readiness Impact

Project Size: 116 units

Parking spaces constructed: 191 spaces

Total Development Costs: \$23.5MM

Hard Costs: \$15.2MM



## Certified Affordable Multi-family Housing

### Real Orlando Example – illustrates EV Readiness Impact

Project Size: 116 units

Parking spaces constructed: 191 spaces

- 20% EV Capable = 38 spaces x \$400/space = \$15,200
- 2% EVSE installed = 3 spaces x \$2,000/space = \$6,000

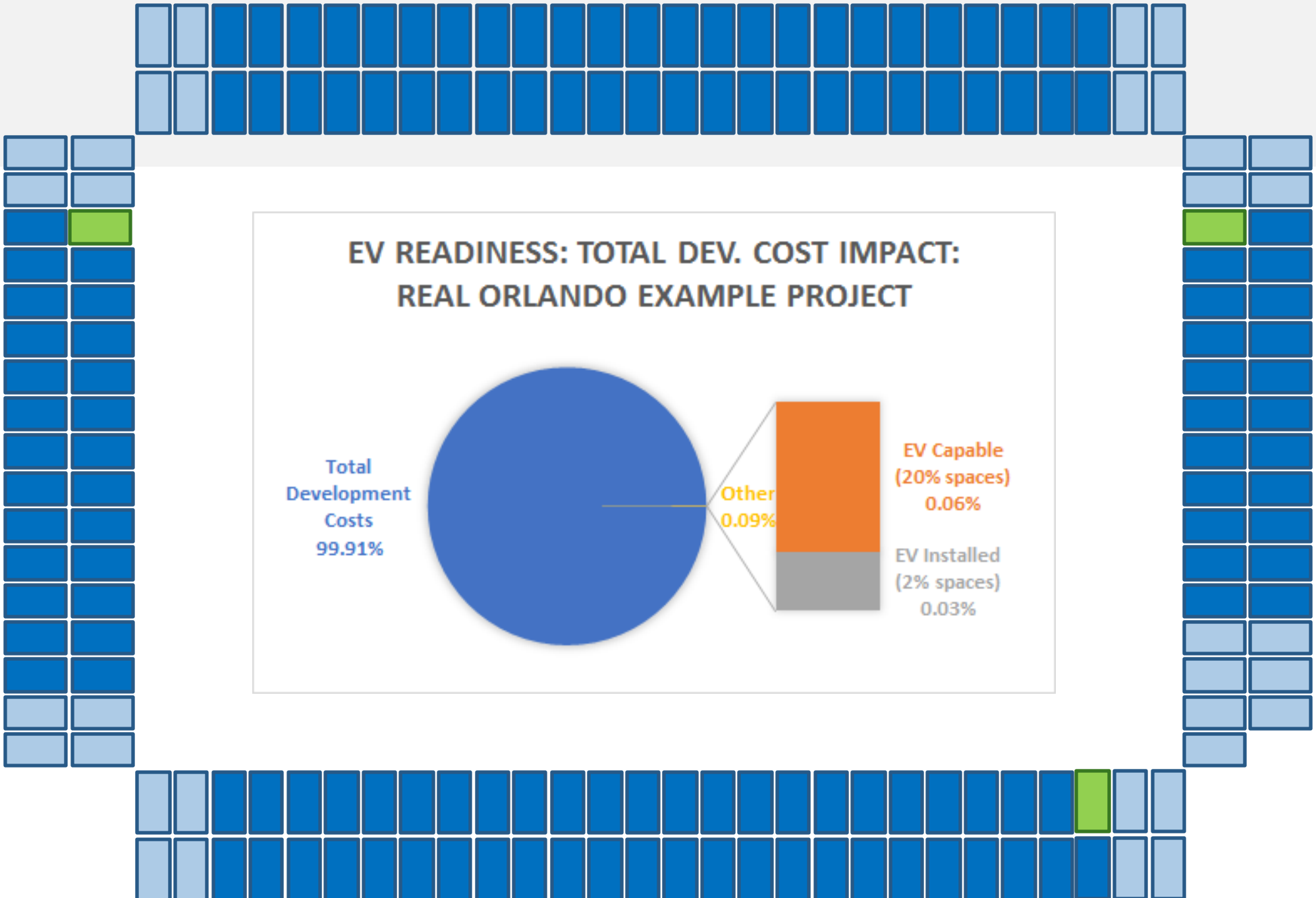
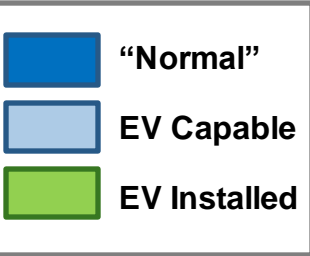
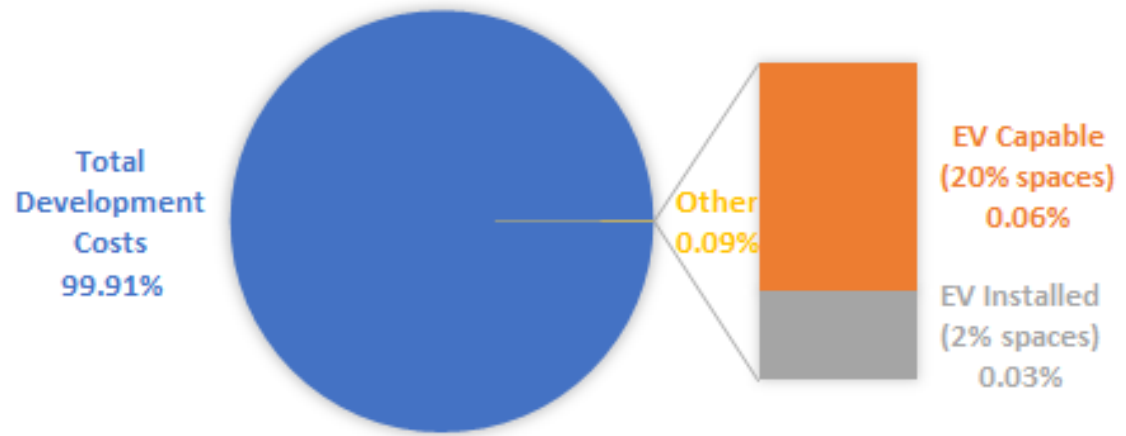
Total Development Costs: \$23.5MM

Hard Costs: \$15.2MM

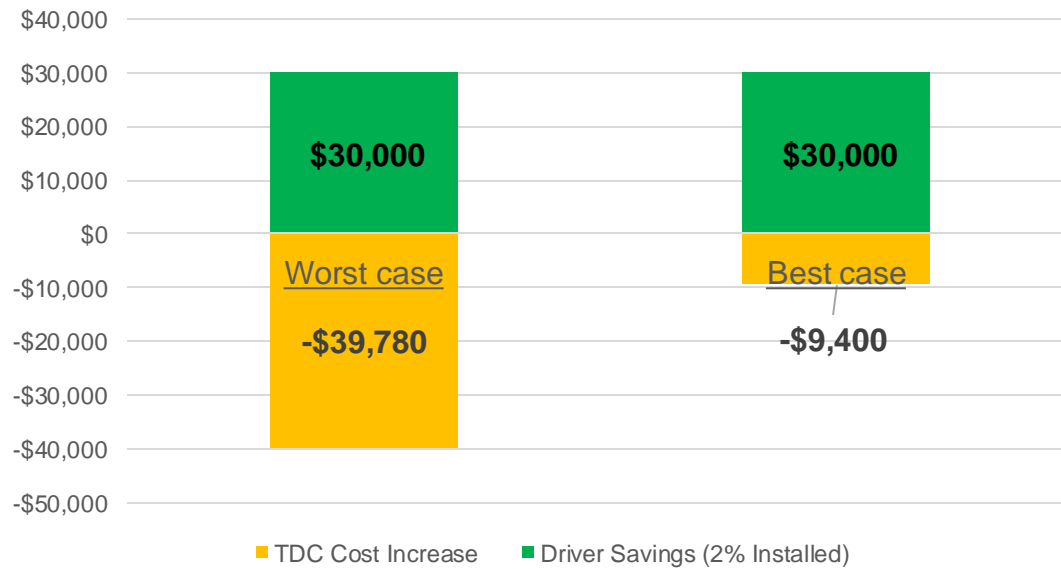
- EV Readiness = 0.0009% (less than 1/10<sup>th</sup> of 1%)



# EV READINESS: TOTAL DEV. COST IMPACT: REAL ORLANDO EXAMPLE PROJECT



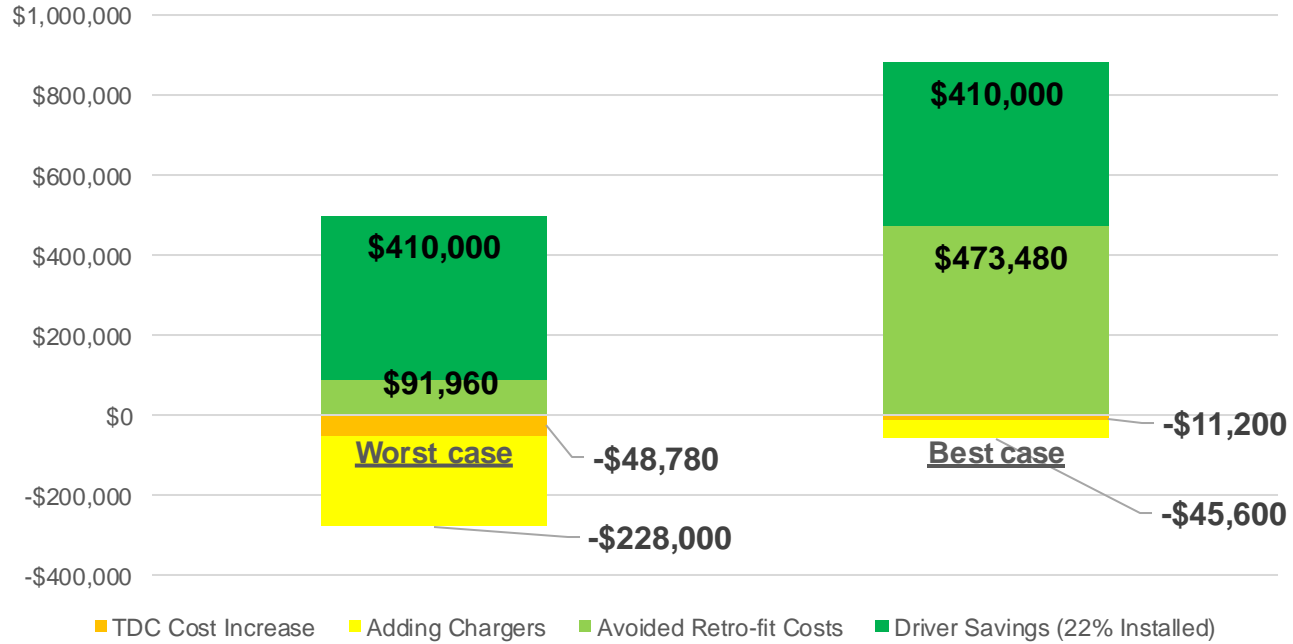
### Consumer Savings with EV Readiness (assumes no EV Capable converted to Installed)



AAA: EV drivers save over \$1,000 per year in fuel and maintenance costs.  
 SWEEPS: EV capable cost ranges from \$200-\$810 per space depending on circumstances. Other: Chargers range from \$600-3,000 per space.

- "Normal"
- EV Capable
- EV Installed

### Consumer Savings with EV Readiness (assumes all EV Capable spaces converted to Installed)

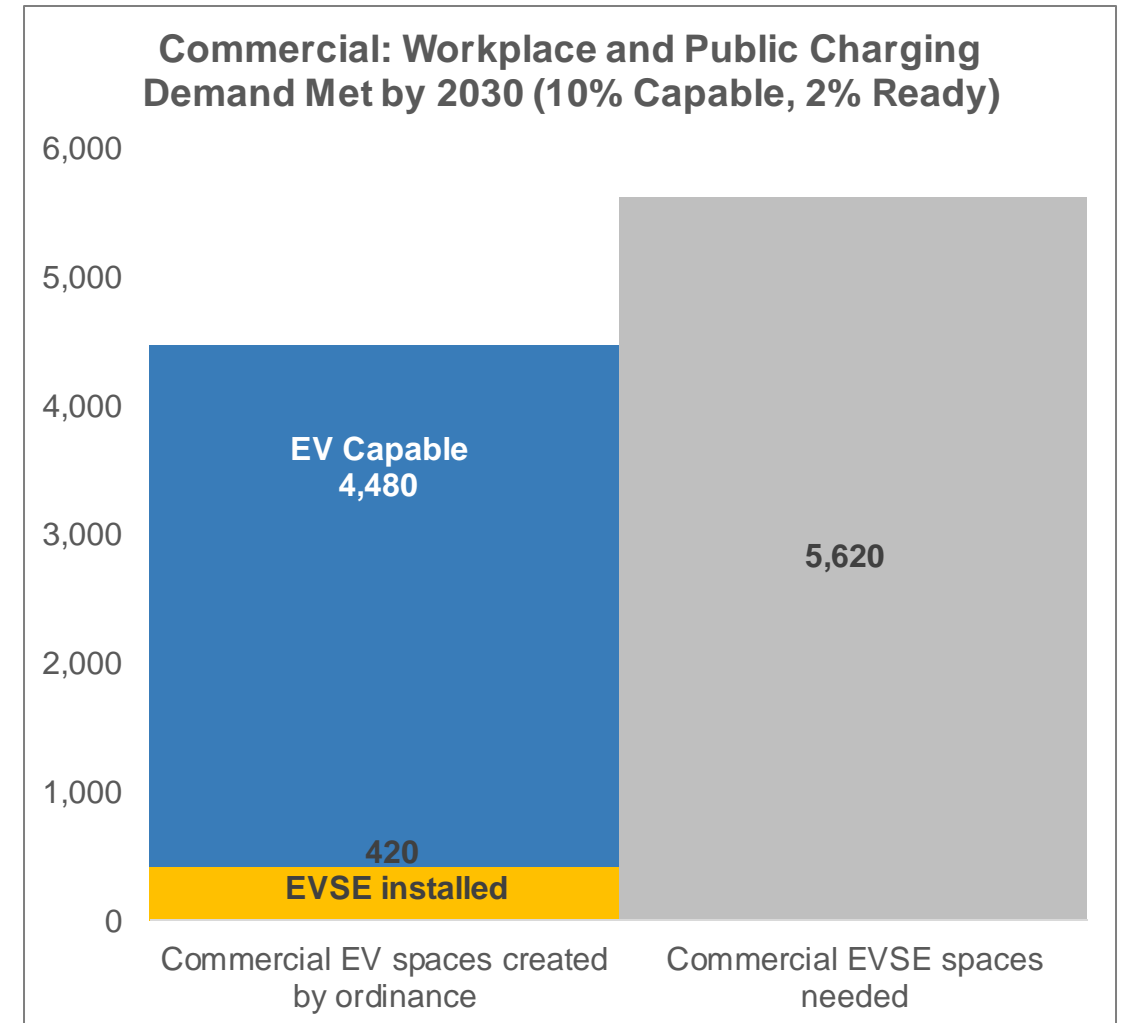
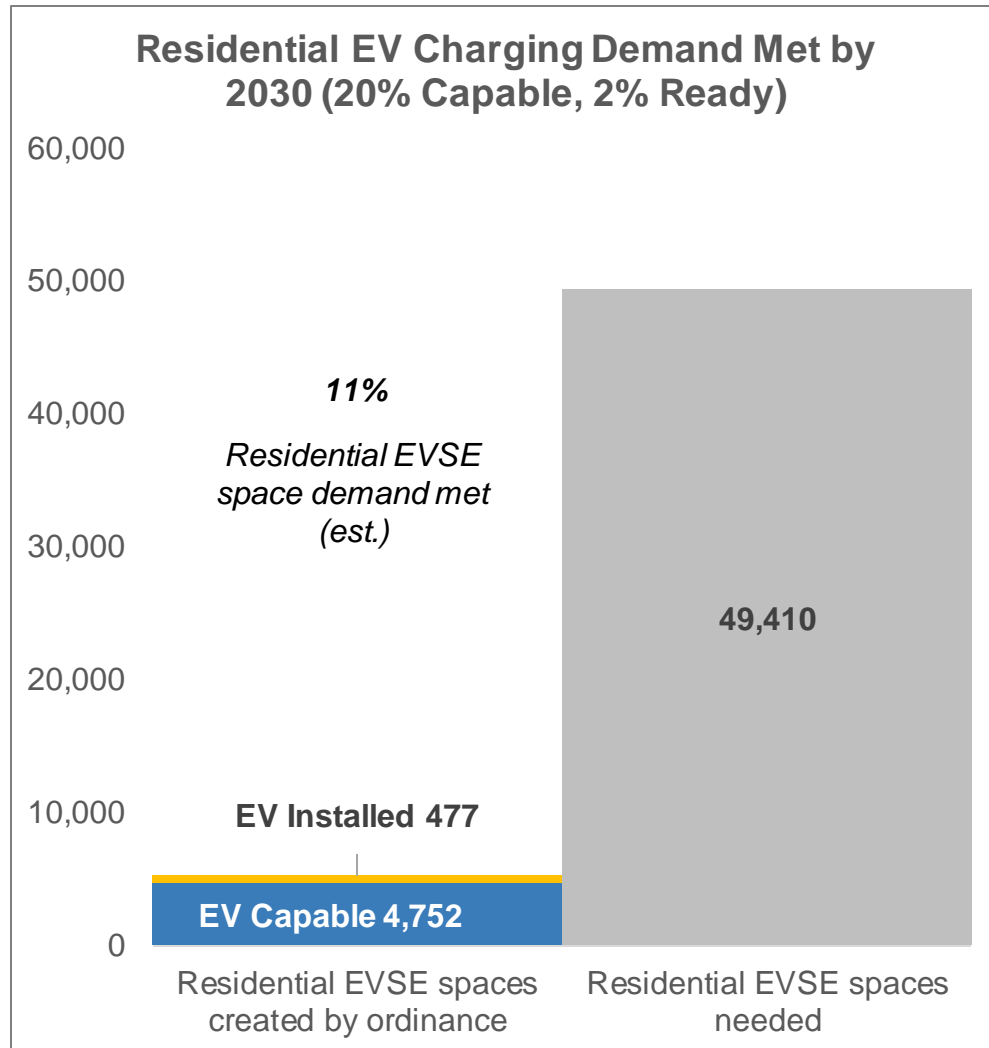


AAA: EV drivers save over \$1,000 per year in fuel and maintenance costs.  
 SWEEPS: EV capable retrofit cost ranges from \$1,010-\$5,420 per space.

- "Normal"
- EV Capable
- EV Installed



# Electric Vehicles will demand charging infrastructure...



# Citywide Multi-family EV Readiness

- 2,640 *new multi-family parking spaces* constructed annually
- 23,760 new multi-family parking spaces from 2022 to 2030!

# Citywide Multi-family EV Readiness

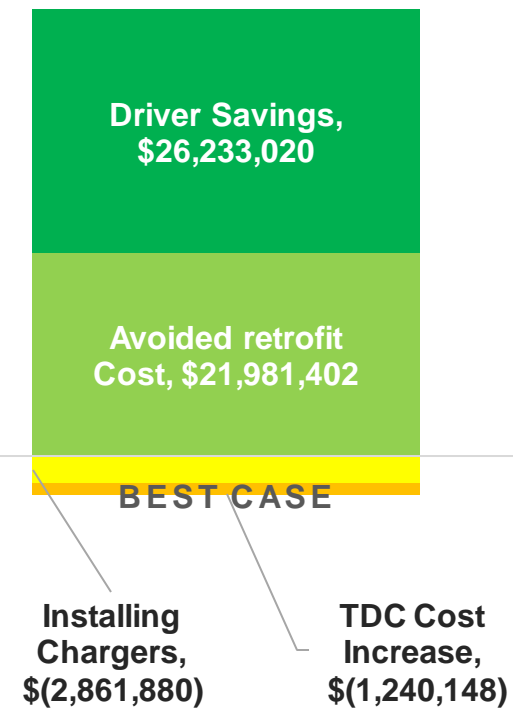
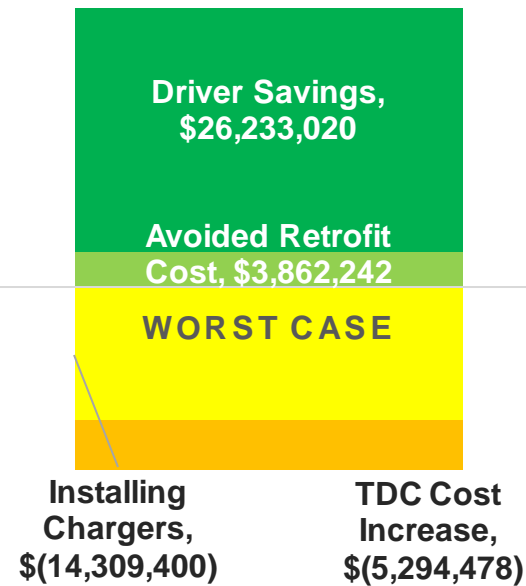
## EV READINESS - ECONOMIC IMPACT IN MULTI-FAMILY EST. \$10MM-44MM SAVED

### **By 2030...**

23,760 new multi-family parking spaces built

4,752 EV Capable spaces

477 EVSE Installed spaces





# We have taken extensive feedback from stakeholders, and have incorporated suggestions where we could

## Feedback we've received

## How we've responded

"Only the few EV owners would benefit"

State of Florida, "legislature finds that the use of electric vehicles conserves and protects the state's *environmental resources*, provides significant *economic savings* to drivers, and serves an *important public interest*. 718.113(8)

"Florida Building Code, has already addressed EV Readiness in [single-family] homes by requiring a dedicated 20amp 120V branch circuit in [the] garage"

Eliminated single-family requirement. Level 1 is perceived by EV drivers as inadequate, but single-family homes typically face lower barriers to installing Level 2 EVSE than multifamily and other commercial.

**"Typically, 240V chargers are hard-wired in parking areas, not plugged in to receptacles."**

**Eliminated the requirement for "EV Ready," which includes *wiring* and *receptacles*.**

**"No voltage or equipment are specified...EVSE Installed infrastructure could be level 1 charging"**

**Added specifications for EVSE Installed (7.2kW, 240A), and EV Capable (40A dedicated per two spaces).**

# We have taken extensive feedback from stakeholders, and have incorporated suggestions where we could

## Feedback we've received

## How we've responded

"Oversizing electrical service for unused EV capable spaces wastes materials and energy."

Mitigated 50% of electrical service by allowing 40A per two spaces which also provides flexibility to load-share between multiple spaces. Downside is that when EV spaces are full, power delivery is slower.

"all quantities seem excessive since EV adoption is currently only about 2%."

EVSE Installed requirement (2%) reflect today's demand. Future demand is reflected in the low-cost EV Capable requirement (10-20%).

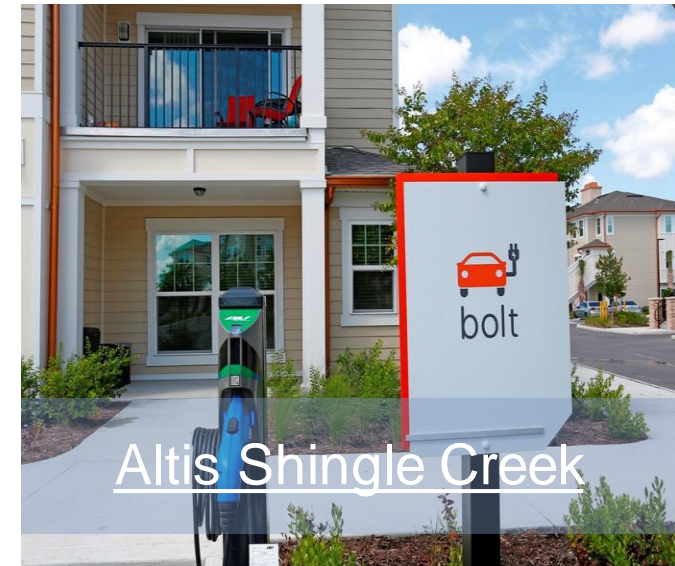
"This [is] in anticipation of a possible market deficit, rather than to address an existing need"

Manufacturers are investing billions into EVs, rapidly increasing models available, decreasing the EV price tag, and committing to 100% electric (e.g. GM by 2035).

"No public charging infrastructure is being created"

**State Highway System EVSE masterplan due by July 1, 2021; City installing 100 public stations 2021; OUC installing DC Fast charging hub downtown**

# Why implement an EV readiness ordinance? Orlando area developments that offer EV charging for their tenants



*"We have had a number of potential tenants ask if we will have charging stations available in the community. I have developed several apartment communities in Orlando, and the stations were utilized regularly and considered an important part of each project." - Orlando multi-family developer*



# Our proposed code places us amongst leaders in Florida and in the Southeast...

	<u>Atlanta, GA (2018)</u>	<u>Miami-Dade County, FL (2019)</u>	<u>Boca Raton, FL (2017), Miami Beach, FL (2016)</u>	<u>Coral Gables, FL (2018)</u>	<u>Orlando (proposal)</u>
<b>Single Family</b>	EV capable	N/A	N/A	N/A	N/A
<b>Multi-family and Commercial</b>	20% EV capable	10% EV-Ready (<2022) 20% EV-Ready (>2022)	2% EVSE-installed; EV capable elements	15% EV capable; 3% EV ready; 2% EVSE installed	<b><u>MF and Hotels:</u></b> 20% Capable; 2% Installed <b><u>Affordable (MF) housing:</u></b> 20% Capable; <b><u>Commercial (non-res):</u></b> 10% Capable; 2% Installed

# Draft language

## 61.363: Number of spaces

The parking requirements of this Part are intended to provide **minimum standards**.

Parking maximums: EVSE Installed parking spaces shall be **exempt from calculation of any parking maximums**.

EV Readiness minimum **parking requirements by use type**:

<u>Type</u>	<u>EV Capable</u> <u>(40A min. per</u> <u>two spaces)</u>	<u>EVSE Installed*</u>
Single Family, Duplex, Townhouse -	—	—
Certified Affordable Multi- family Housing	20%	-
Multifamily, Hotel, all parking structures	<u>20%</u>	2% (requirement begins at 50 spaces)
Non-residential (offices, retail, public, recreational and institutional uses)	<u>20%</u> <u>10%</u>	2% (requirement begins at 250 spaces)
Industrial (employee parking only)	<u>10%</u>	2% (threshold begins at 250 spaces)

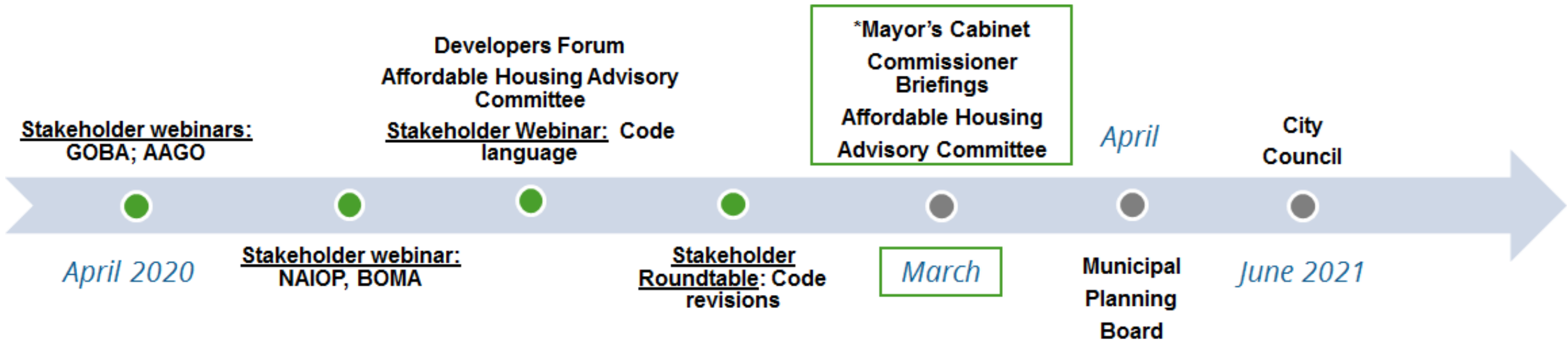
\*Additional EVSE installed space required every additional 50 spaces: Example (Multifamily), 50-99 spaces requires 1 EVSE space, 100-149 spaces requires 2 EVSE installed, 150-199 spaces requires 3 EVSE installed and so forth.

# What is not required?

- **Project types:** Change of Use, Substantial Improvements, Existing Buildings
- **Location:** EV Capable, EV Ready and EVSE space locations are not specified, approved through the Master Plan process
- **Parking Max:** EVSE installed spaces excluded from parking maximums.
- **Management requirements:** EVSE installed spaces can be reserved (employees, tenants) or public (customers, visitors, shared by tenants), networked (charged for use) or have no POS (fleet charging)



# We may hear opposition to any form of regulation, but we are well prepared to move forward.



Bloomberg  
Philanthropies

American Cities  
Climate Challenge

Thank you!



# Draft language

## **BEGIN DRAFT LANGUAGE:**

3G: Electric Vehicle (EV) Readiness minimum requirements

### 61.360: **Purpose**

- Provide electric vehicle charging abilities distributed throughout the City to serve public mobility needs, prepare for emerging electric vehicle technologies, improve air quality, and achieve City sustainability goals, including climate change mitigation.
- ~~• Electric vehicles emit zero tailpipe emissions and are powered on less than half the emissions, on average, than an internal combustion vehicle on a per mile basis.~~
- ~~• Electric vehicle adoption aligns with the Mayor's goals to reduce greenhouse gas emissions by 90% by 2040, a goal set forth in the City of Orlando's Community Sustainability Action Plan.~~

### 61.361: **When EV Readiness parking requirements apply**

- The requirements of this Part shall apply to new **structures** development or substantial enlargement ~~to existing of~~ structures.



# Developer survey responses – Purpose & When It Applies

"only the few EV owners would **benefit**"

"The (FL) Legislature finds that the use of electric vehicles conserves and protects the state's environmental resources, provides significant economic savings to drivers, and serves an important public interest. (718.113(8)).

"no public charging infrastructure is being created"

"Private development should not bear the **responsibility** for providing and maintaining EV infrastructure"

**State:** FDOT must create a master plan for the development EVSE along the State Highway System by July 1, 2021 (339.287 and 338.236)  
**City of Orlando** installing 100 publicly accessible stations this year  
**OUC** installing DC Fast charging hub downtown

"**Main barrier** to EV adoption is cost of the EV, not access to charging stations."

**Consumer Reports:** survey indicated lack of access to public charging (48%) home charging (28%) as significant barriers to adoption.

Total cost of ownership  
Price tag upfront: 2025 parody (Li-battery costs down 87% from 2010-2019)  
O&M: 60% less per mile to power an EV in Florida (DOE)

"Private development is not and does not seek to become a **public fueling station**."

**FL Statute (366.94(1))**, "The provision of electric vehicle charging to the public by a nonutility is not the retail sale of electricity..."

# Draft language

## 61.362: General requirements

EV Readiness requirements are categorized in ~~three~~ two levels as follows:

- **EV Capable**: These parking spaces prepare for future EVSE installation by providing dedicated electrical capacity in the service panel (40amp minimum breaker per for every space or station two EV Capable two spaces) and conduit (size) to the EV Capable space, ~~but~~ It does not require wiring nor a receptacle.
- ~~**EV Ready**: These spaces add the requirement for raceway and a 240V receptacle. The spaces are ready to install EVSE without needing any additional infrastructure or electrical improvements in the future. EVSE can simply be plugged in at the owner's discretion. Once installed, these spaces are considered EVSE installed and must meet the standards identified in this section.~~
- **EVSE Installed**: These spaces are reserved for EVs and provide drivers the opportunity to charge their electric vehicle using EV charging stations rated at a minimum of 32amp 7.2 kW. Electric vehicle supply equipment (EVSE) should be installed per the requirements of the National Electrical Code (NFPA 70) as adopted and amended by the State of Florida for enforcement by the City.

# Developer survey responses – General Requirements

"Typically, 240V chargers are **hard-wired** in parking areas, not plugged in to receptacles."

"EV Ready **receptacles** will create a confusing, attractive nuisance..."

"Installing excess capacity or unused infrastructure creates wasted energy and resources, **contrary to the City's sustainability objectives.**"

**Proposal revision:** "EV Ready" reduced to "EV Capable," eliminating this issue.

"Dedicated electrical **capacity** is **not defined**... **conduit** requirements are not clear"

"**No voltage or equipment are specified**...EVSE Installed infrastructure could simply be **level 1** charging"

**Proposal revision:** Specifications include:  
*EV Capable:* 40A dedicated panel space per two spaces – this reduces *potential* transformer upgrades. EVSE  
*EVSE installed:* 32A 7.2W charging station

"**Oversizing** electrical service for unused EV capable .... Spaces wastes materials and energy."

"Before definitions can be finalized, proper **engineering analysis** should be performed to evaluate the impact of **charger sizing, conduit location and termination requirements, type and size of receptacles, ground fault protection for EV Ready circuits, required charging rate, and costs** for installation during construction or after."

"Creates an **enforcement burden**"

**FL statute 366.94(3):**  
"officer shall charge the operator ...noncriminal traffic infraction"

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# Developer survey responses – Number of spaces

"The National Electric Code, and therefore the Florida Building Code, has **already addressed EV Readiness in homes** by requiring a dedicated 20amp **120V** branch circuit in a dwelling unit garage"

**Proposal revision:** Single-family home requirements for level 2 requirements have been removed because barriers to install level 2 in SF are lower.

"EVSE parking shall be exempt from... parking maximums... creates new problems: "1) **shortage of spaces** 2) extra spaces at the developers cost..."

**Clarification:** EV Capable spaces are not reserved for EVs and should not constrain parking. EVSE requirement at 2% is close to existing adoption rates locally.

"**all quantities seem excessive** since EV adoption is currently only about 2%."

"This seems like **way too many spaces**"

"This [is] in anticipation of a **possible market deficit**, rather than to address an existing need"

**Projections show that** this drafted code will move in a positive direction, but ultimately the market will play a critical role. When assuming all required EV Capable spaces are installed in the future, there is still a **70% shortfall** in the residential sector. Market response will be critical to fill the gap.

# Draft language

## 1.364: Location

Placement of the EV Capable, ~~EV Ready~~ and EVSE installed spaces should be identified [by the development team](#) during the Master Plan approval process.

## 61.365: Design

Charging equipment must be mounted on the wall or on a structure at the end of the electric vehicle parking space provided. No charging devices may be placed within the dimensions of a space on the sides or entrance to a space. When cords and connectors are not in use, retraction devices or locations for storage shall be located sufficiently above the pedestrian surface and the parking lot as to reduce conflicts with pedestrians and vehicle maneuvering. Cords, cables, and connector equipment shall not extend across the path of travel in any sidewalk or walkway. Equipment mounted on structures such as pedestals, lighting posts, bollards, or other device shall be located in a manner that does not impede pedestrian, bicycle, or transit travel. [Alternatives may be approved by the Zoning Official.](#)

Depending upon location on the site, additional landscaping elements may be required.

# Developer survey responses – Location and Design

"The location... should be solely at the **developer's discretion.**"

"At a location that is **economically practical** for the building owner."

**Clarification:** EVSE installed and EV Capable space locations **are at the discretion of the developer**, excluding the one ADA adjacent EVSE space, allowing flexibility and optimization.

"**single-headed** charging infrastructure is **more costly** (per space) to install"

"The location... should be solely at the **developer's discretion.**"

"disagree with having at least one spot located adjacent to an ADA space... should be located in an area **most economically practical** for the building owner."

**Alternative option** to one ADA adjacent space: one EVSE space meets ADA spatial requirements, but remains EV designated – will avoid single headed charging station. Check on location flexibility.

"If the ADA designated space becomes EV designated, it will make the ADA space unusable for the majority of ADA users."

**Clarification:** No ADA space should become EV designated.

"What justification does the City provide to exempt the required signage for EV Chargers from sign code?"

**Clarification:** Sign code does not cover parking signs, similar to ADA spaces.

# Draft language

## 61.366 Accessibility

A minimum ~~of 5% of the EVSE installed spaces but not less than~~ one (1) EVSE installed space shall be located adjacent to an ADA designated space to provide access to the charging station. It shall be designated as an EV reserved space. These EVSE accessible spaces should have all relevant parts located within accessible reach, and in a barrier-free access aisle for the user to move freely between the EVSE and the electric vehicle.

## 61.367 Signage

Spaces should be designated following MUTCD standards. Any signage to denote parking spaces is exempt from sign code .

**END OF DRAFT LANGUAGE**



# Developer survey responses – Accessibility and Signage

"**single-headed** charging infrastructure is **more costly** (per space) to install"

"The location... should be solely at the **developer's discretion.**"

"disagree with having at least one spot located adjacent to an ADA space...should be located in an area **most economically practical** for the building owner."

**Alternative option** to one ADA adjacent space: one EVSE space meets ADA spatial requirements, but remains EV designated – will avoid single headed charging station. Check on location flexibility.

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# BRIEFING SHEET

## AN EV READY ORLANDO

An electric vehicle (EV) readiness code requires a portion of parking spaces in new construction to meet current EV charging needs and prepare for future demand.

### Two levels of EV Readiness proposed:



**EV Capable:** Future focus, provides the electrical service capacity and conduit necessary for a future installation at 10-20% of spaces.



**EVSE Installed (electric vehicle supply equipment):** Immediate focus, provides access to level 2 charging at 2% of spaces in most cases.

#### Why EV Readiness?

- Technological advances are revolutionizing the marketplace:** Projections indicate 30% of registered light duty vehicles will be electric by 2030.<sup>1</sup> GM has committed to a 100% EV fleet by 2035. The upfront cost of EVs is rapidly decreasing and projected to be less than traditional vehicles by 2024.<sup>2</sup>
- Public Health and Environment:** The total life cycle emissions (including battery manufacturing) are substantially lower for EVs (carboncounter.com), particularly during the useful life phase where zero tailpipe emissions lower air pollutants and 63% in greenhouse gas emissions per mile in Florida.<sup>3</sup>
- Equity:** EVs are more affordable compared to traditional gasoline vehicles. Fueling in Florida only costs \$1.10 per e-Gal compared to \$2.25 gallon of gas - over 50% savings!<sup>4</sup> This cost savings is reduced when charging in public, which is one reason why EV owners charge at home 80% of the time.
- Impact:** Our analysis combining EV adoption rate projections with Orlando development data shows that this code will meet 1% of residential EV charging demand with EVSE installed, but more importantly, provides an additional 28% capacity as EV Capable by 2030.

#### EV Readiness Removes Cost Barriers



**Above:** Multifamily commercial parking lot with 10 spaces in Dublin, CA. Cost estimates range by local market context, building type, and size.

Costs to make parking EV Capable at the time of construction are typically small, but remove significant financial barriers for building owners to retrofit later—typically **saving around 75%** compared to retrofit costs.<sup>5</sup>

#### Several factors contribute:

- Demolition and repair of surface parking.
- Breaking and repairing walls.
- Longer conduit runs (also referred to as rickways) -
- Upgrading electric service panels.
- Soft costs: permits, plans, inspections, management

1. Technology: [EV Outlook 2020](#), [MotorIntelligence](#)  
 2. Technology: [National Renewable Energy Lab](#)  
 3. Emissions: [www.carboncounter.com/vehicles/electric-vehicles.html](#)  
 4. Fuelly: [https://www.fuelly.com/price-comparison/](#)  
 5. Research: [Sustainable Energy Efficiency Project](#)

## What is included in this code?

A new section in the Land Development Code would cover new development and substantial enlargements to existing structures as follows:

Type of Development	EV Capable spaces	EVSE installed spaces
Certified Affordable Multifamily	20%	-
Multifamily, hotel, all parking structures	20%	2% (begins at 50 spaces)
Non-residential (offices, retail, public recreation, institutional uses)	10%	2% (begins at 250 spaces)
Industrial (employee parking only)	10%	2% (begins at 250 spaces)

Note: Required EVSE installed spaces are exempt from parking maximum calculations.

## EV Ready Orlando: Policy Making Process

Over the course of the past year, the City team of Sustainability and Resilience, City Attorney, Planning, Transportation, Permitting and others have worked to develop a policy that fits Orlando. During this time, engaging stakeholders and integrating feedback has played an integral role.



#### Survey Feedback

"Only the few EV owners would benefit"

"Florida Building Code, has already addressed EV Readiness in [single-family] homes by requiring a dedicated 20amp 120V branch circuit in [the] garage"

"Typically, 240V chargers are hard-wired in parking areas, not plugged in to receptacles."

#### Revisions, Facts, and Clarifications

State of Florida, "legislature finds that the use of electric vehicles conserves and protects the state's environmental resources, provides significant economic savings to drivers, and serves an important public interest. 718.113(8)

Eliminated single-family requirement. Level 1 is perceived by EV drivers as inadequate, but single-family homes typically face lower barriers to installing Level 2 EVSE than multifamily and other commercial.

Eliminated the requirement for wiring and receptacles.

"No voltage or equipment are specified...EVSE installed infrastructure could be level 1 charging"

Added specifications for EVSE installed (7.2kW, 240A), and EV Capable (40A dedicated per two spaces).

"Oversizing electrical service for unused EV capable spaces wastes materials and energy."

Mitigated 50% of electrical service by allowing 40A per two spaces which also provides flexibility to load-share between multiple spaces. Downside is that when EV spaces are full, power delivery is slower.

"all quantities seem excessive since EV adoption is currently only about 2%."

EVSE installed requirement (2%) reflect today's demand. Future demand is reflected in the low-cost EV Capable requirement (10-20%).

"This [is] in anticipation of a possible market deficit, rather than to address an existing need"

Manufacturers are investing billions into EVs, rapidly increasing models available, decreasing the EV price tag, and committing to 100% electric (e.g. GM by 2035).

"no public charging infrastructure is being created"

State Highway System EVSE masterplan due by July 1, 2021; City installing 100 public stations 2021; OUC installing DC Fast charging hub downtown

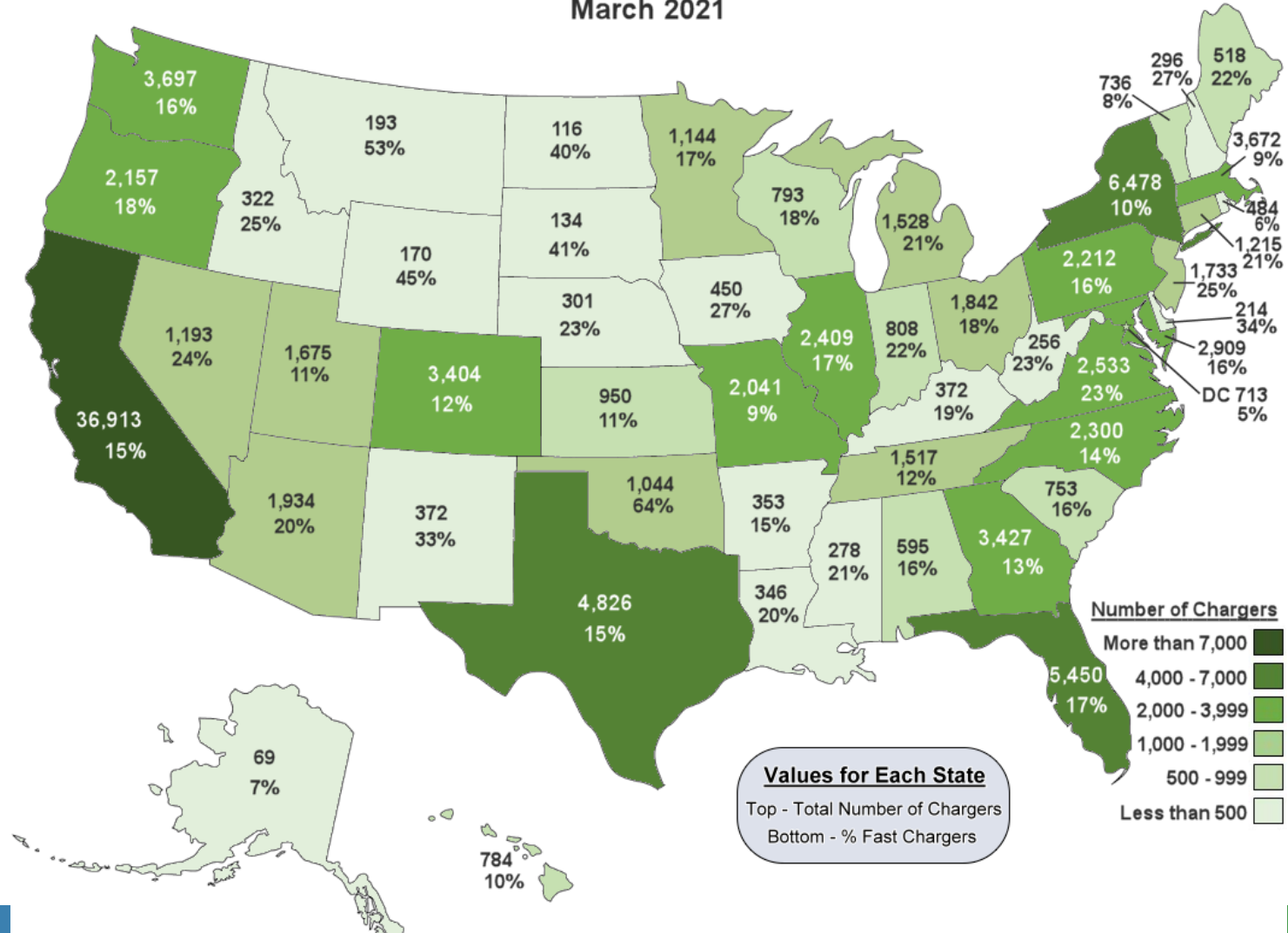
## How does Orlando compare to other American Cities Climate Challenge and Florida cities?

	Miami-Dade County, FL (2019)	Broward County, FL (2017) Miami Beach, FL (2018)	Central Florida, FL (2018)	Atlanta, GA (2018)	San Jose, CA (2018)	Denver, CO (2020)
<b>Single Family</b>	N/A	N/A	N/A	EV Capable	EV Ready	EV Ready
<b>Multi-family</b>	10% EV-Ready (1-2022) 20% EV-Ready (1-2022) (min. 10 spaces)	EV Capable elements 2% EVSE installed	15% EV Capable 3% EV Ready 2% EVSE installed	20% EV Capable	10% EVSE Installed 20% EV Ready 70% EV Capable	5% EVSE Installed 15% EV Ready 75% EV Capable
<b>Commercial (non-residential)</b>	(same as above)	(same as above)	(same as above)	(same as above)	10% EVSE Installed 40% EV Capable	5% EVSE Installed 10% EV Ready 10% EV Capable

\*San Jose: Hotels/motels require 10% EVSE installed, 50% EV Capable parking spaces.

# Additional info from Department of Energy...

Total Number of Level 2 & Fast Charging Units per State with Share of Fast Charging Units  
March 2021



# Additional info from Department of Energy...

