

**CHAPTER 61-PARKING
ELECTRIC VEHICLE READINESS
LAND DEVELOPMENT CODE AMENDMENT
STAFF REPORT**

<p>Owner: N/A</p> <p>Applicant: City of Orlando</p> <p>Project Manager: Chris Castro, Director of Sustainability & Resilience</p> <p>Project Planner: Shannan Stegman, Project Manger I</p>	<p>Description of the Request: Land Development Code Amendment to Chapter 61 (Roadway Design and Access Management) to include provisions for electric vehicle readiness.</p> <p>Staff's Recommendation: Approval of the request.</p>	<p>Public Comment: Staff hosted a series of public engagements via webinar and conducted three on-line surveys over a period of approximately 13 months. As of the date of this Staff Report, various discussions have taken place and 37 survey responses have been received, analyzed and integrated into the policy recommendations contained in this report. In addition, staff posted this item on the City's website and placed a classified ad in the Orlando Sentinel.</p>
<p>Updated: June 2, 2021</p>		

BACKGROUND

Since 2007, the City of Orlando has been working to transform into one of the most environmentally friendly, socially equitable, and economically vibrant cities in America. To achieve this vision, Orlando Mayor Buddy Dyer launched a comprehensive city-wide initiative, Green Works Orlando, to support City operations, community partners, businesses, and our residents in becoming a leading city at the forefront of innovation and sustainability.

The Green Works Orlando initiative has established several important municipal and citywide goals, including the transition of 100% city vehicle fleet to electric and alternative fuel vehicles by 2030 and achieve a zero-carbon economy by 2050. As part of that goal, we have been investing in programs to accelerate the adoption of electric vehicles, including providing consumer rebates, public EV charging infrastructure, LYNX electric bus fleet, and streamlining the permitting process for EV charging infrastructure.

Through the passage of this EV Readiness code, the future developments of commercial and multifamily housing in Orlando will be more equipped to support the rapid increase in electric vehicle adoption and mitigate the disproportionately high retrofit expenses to install EV charging infrastructure in the future.

ANALYSIS

Overview.

An Electric Vehicle (EV) Readiness code requires a portion of parking spaces in certain developments to meet current EV charging needs and prepare for future demand. To date, the City's Land Development Code (LDC) contains no regulations addressing EV parking. This amendment will add minimum requirements for certain new developments and substantial enlargements to provide EV parking accommodations. Ensuring the City is EV ready is important for several reasons:

Technological advances: Projections by the National Renewable Energy Lab (Department of Energy) indicate that up to 30% of light duty vehicle registrations will be electric by 2030.¹ Automotive manufacturers and ride services are leading this transformation and recent public commitments include:

- General Motors: Committed to a 100% EV fleet by 2035²
- Volvo: Committed to 100% EV fleet by 2030³
- Range Rover/Jaguar: Committed to 100% EV by 2025⁴
- Honda Committed to 100% EV by 2040⁵
- Uber: Committed to 100% EV by 2030⁶
- Lyft: Committed to 100% EV by 2030⁷

Additionally, Ford has committed \$24 billion by 2025 towards developing EV fleets.⁸ For consumers, one result is that the upfront cost of EVs is rapidly decreasing and projected to be less than traditional vehicles by 2024.⁹ according to Bloomberg Energy Finance.

Removing prohibitive cost barriers: 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.¹⁰ *Several contributing factors include:* demolition and repair of surface parking, breaking and repairing walls, longer conduit runs (also referred to as raceways), upgrading electric service panels and soft costs including : permits, plans, inspections, management.

Public Health and Environment: The total life cycle emissions (including battery manufacturing) are substantially lower for EVs, particularly during the useful life phase where zero tailpipe emissions lower air pollutants by 63% in greenhouse gas emissions per mile in Florida.¹¹

Cost Equity: EVs are more affordable to drive compared to traditional gasoline vehicles. Fueling in Florida only costs \$1.10 per e-Gal compared to \$2.25 gallon of gas – over a 50% savings.¹² This cost savings is reduced when charging in public, which is one reason why EV owners charge at home 80% of the time.¹³

Local Impact: Combining EV adoption rate projections with City of Orlando development data suggests that adopting attainable EV Readiness regulations now will accommodate 1% of residential EV charging demand with EVSE Installed, and, more importantly, provides an additional 10% capacity needed by 2030 by way of EV Capable spaces.

Purpose.

Electric vehicles are an important emerging technology for Orlando residents for a number of reasons, as recognized by the Legislature of the State of Florida: “conserves and protects the state’s environmental resources, provides significant economic savings to drivers, and serves an important public interest.”¹⁴ This code will result in the reduction of harmful tailpipe emissions that contribute to public health problems. It will also create direct economic benefits: EV drivers save over \$1,000/year in reduced operation and maintenance costs¹⁵ and property owners avoid costly parking space retrofits. Estimates for the economic savings in the multi-family sector alone range from \$10-44 million dollars by 2030 (see appendix). In addition, electric vehicle adoption is critical to achieving the goal to reduce greenhouse gas emissions 90% by 2040 set forth in the Orlando Community Sustainability Action Plan. Currently, transportation accounts for 20% of the City of Orlando’s GHG emissions.¹⁶ Without some level of requirements in place, EV charging and EV conversion will be more difficult in the future in settings where residents and/or visitors don’t directly control the property and are reliant on property owners to retrofit their properties based on demand.

In review of land development codes across the nation, it was found that EV Readiness is now an established best practice., especially among large and mid-sized cities comparable to Orlando. The following table summarizes the adoption of EV Readiness codes as an established practice in the Southeast and demonstrates that this code proposal is consistent with proven practices:

	Atlanta, GA (2018)	Miami-Dade County, FL (2019)	Boca Raton, FL (2017), Miami Beach, FL (2016)	Coral Gables, FL (2018)	Orlando (proposal)
Single Family	EV capable	N/A	N/A	N/A	N/A
Multi-family and Commercial	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	MF and Hotels: 20% Capable; 2% Installed Affordable (MF) housing: 20% Capable; Commercial (non-res): 10% Capable; 2% Installed

Sunrise Provision.

The new requirements will be added to the Parking Section of Chapter 61 (Roadway Design and Access Management) and will apply to new and substantial enlargements of multi-family, certified affordable multifamily, commercial and industrial developments. In order to give the development community ample time to learn the new regulations and to include them in development programs, the proposed regulations will not take effect until **January 1, 2022**.

PUBLIC PARTICIPATION

The Office of Sustainability and Resiliency in tandem with the Planning Division (“City”), hosted a series of stakeholder engagements as follows:

- 04/24/20 GOBA webinar
- 06/02/20 AAGO webinar
- 08/07/20 City met with League of Women Voters, NAACP, Sierra Club
- 09/15/20 NAIOP and BOMA webinar
- 10/21/20 Proposal shared at Developers’ Forum
- 11/05/20 Proposal shared at Affordable Housing Advisory Committee (AHAC)
- 11/18/20 Public Roundtable webinar (Proposed code language shared)
- 01/06/21 Public Roundtable webinar (Proposed code language shared)
- 01/13/21 City and OUC met with Territo Electric
- 01/29/21 Public Roundtable webinar (Proposal revisions presented)
- 03/18/21 Proposal shared at Affordable Housing Advisory Committee (AHAC)
- 04/05/21 Affordable Housing Developers webinar (FHC, ONIC, Ability Housing, LIFT Orlando)
- 05/04/21 City met with Southern Alliance For Clean Energy, Moms for Clean Air Force, EV Transports, Southern Alliance for Clean Energy
- 05/12/21 Public Roundtable webinar
- 05/18/21 City met with NAACP

In addition to the discussions listed above, City staff provided opportunities for public input through the surveys listed below. Survey links were provided at the webinars listed above and included in follow-up emails to participants. A follow-up survey was conducted to gauge the efficacy of revisions provided.

- General survey on EV Readiness Code (17 responses) (open to responses from 4/24/20 through 1/1/21).
- Proposed language survey (18 responses—4 unique responses) (open from 1/29/21 through 2/12/21)
- Revised language survey (2 responses) (open from 1/29/21 through 2/18/21).
- Responses received by the City were analyzed and revisions, clarifications, and further information were provided to stakeholders on (1/29/21).

City staff welcomed the extensive feedback received from the public outreach efforts and incorporated suggestions into the proposed language where feasible.

Some of the modifications made as a direct result of public input are summarized in the following table:

FEEDBACK RECEIVED	RESPONSE
“Only the few EV owners would benefit.”	State of Florida, “legislature finds that the use of electric vehicles conserves and protects the state’s <i>environmental resources</i> , provides significant <i>economic savings</i> to divers, and serves an <i>important public purpose</i> .” 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 barriers to installing Level2 EVSE than multifamily and other commercial.
“Typically, 240V chargers are hard-wired in parking areas, not plugged in to receptacles.”	Eliminated the requirements 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).
“Over-sizing 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%) reflects today’s demand. Future demand is reflected in the lower 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 of dollars into EV’s: rapidly increasing models available, decreasing the price tag, and committing to 100% electric (e.g. GM by 2035).
“No public charging infrastructure is being created.”	<i>State</i> : Highway System EVSE Masterplan due by July 1, 2021; <i>City</i> : Installing 100 public stations in 2021; <i>OUC</i> : Installing DC fast charging hub downtown.
“Why not use TIF funds to offset costs for developers?”	<i>Per Florida State Statutes</i> : To obtain an impact fee credit of any type or category the use or contribution must provide capacity to a facility. As in Transportation, the facility could add lanes to an existing major roadway network to accommodate more vehicles or extend a multi-use trail to connect cyclists to another destination. Similar to fueling pumps, EV charging stations are not adding capacity to the transportation infrastructure.

Summary.

Staff from the Office of Sustainability and Resiliency, City Attorney’s Office, Planning Division, Building Department, Housing Department and Transportation Planning worked closely together for several months to develop the proposed regulations and ensure the City is well positioned to meet the needs of EV owners both today and into the future. As such, the proposed requirements include two levels of “EV Readiness,” for meeting demand today (EVSE Installed) and preparing for the future (EV Capable):

EVSE Installed: Parking spaces that will have Electric Vehicle Supply Equipment, also known as level two charging stations.

EV Capable: Parking spaces that are prepared for future EVSE installation with conduit and capacity in the electrical panel. These spaces will serve internal-combustion engine vehicle drivers until equipped with EVSE in the future.

Proposed Language.

The proposed code language is as follows and is subject to final review and approval by the City Attorney’s Office. All language is new and will be added to the existing parking code:

PART 3G. - ELECTRIC VEHICLE READINESS

Sec.61.360. - Purpose of Electric Vehicle Parking Requirements.

The requirements of this Part are intended to 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.

Sec.61.361. - Applicability.

The requirements of this Part shall apply to new development or substantial enlargement of structures.

Sec.61.362. - General Requirements.

- (a) Electric vehicle parking spaces shall meet all performance standards of Ch. 61 Part 3.
- (b) EV Readiness requirements are categorized in two levels as follows:
 - *EV Capable:* These parking spaces prepare for future EVSE installation by providing dedicated electrical capacity in the service panel (40amp breaker for every two EV Capable two spaces) and conduit to the EV Capable space. It does not require raceway nor a receptacle.
 - *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.

Sec.61.363. - Number of Spaces Required.

The parking requirements of this Part are intended to provide minimum standards and do not count towards maximum parking requirements. The EV parking requirements are based on a percentage of the minimum required parking spaces of **Part 3** of this Chapter.

TYPE	EV Capable**	EVSE Installed (threshold)**
Certified Affordable Multi-family Housing	20%	N/A
Multifamily, Hotel, all parking structures	20%	2% (requirement begins at 50 spaces)
Commercial (non-residential)* (office, retail, and public, recreational & institutional uses)	10%	2% (requirement begins at 250 spaces)
Industrial (employee parking only)	10%	2% (requirement begins at 250 spaces)

*Commercial projects for fuel retailers in which *automotive services* is the primary use are excluded from requirements contained in this section.

**All partial space requirements are rounded down.

Sec. 61.364. - Location.

Placement of the EV Capable and EVSE installed required spaces must be identified by the development team during the Master Plan approval process.

Sec. 61.365. - Design.

- (a) Charging equipment must be mounted on the wall or on a structure at the end of the electric vehicle parking space provided.
- (b) No charging devices may be placed within the dimensions of a space on the sides or entrance to a space.
- (c) 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.
- (d) Cords, cables, and connector equipment shall not extend across the path of travel in any sidewalk or walkway.
- (e) 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.
- (f) Alternative designs may be approved by the Zoning Official.
- (g) Depending upon location on the site, additional landscaping elements may be required.

Sec. 61.366. - Accessibility.

- (a) A minimum of one (1) EVSE installed space must be located adjacent to an ADA designated space to provide access to the charging station.
- (b) The accessible space must be designated as an EV reserved space.
- (c) The 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.

Sec. 61.367. - Signage.

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

FINDINGS

In review of the proposed LDC amendment, it is found that:

1. The proposed Land Development Code amendment is consistent with the State Comprehensive Plan (Chapter 187, Florida Statutes).
2. The proposed Land Development Code amendment is consistent with the East Central Florida Strategic Regional Policy Plan.
3. The proposed Land Development Code amendment is consistent with the provisions of Chapter 163, Part II, Florida Statutes.
4. The proposed Land Development Code amendment is consistent with the objectives and policies of the City's adopted Growth Management Plan (GMP).

RECOMMENDATION

Staff recommends approval of the proposed amendment to the Orlando Land Development Code.

SOURCES CITED

1. Department of Energy National Renewable Energy Lab: Electrification Futures Study (2018), <https://www.nrel.gov/docs/fy18osti/71500.pdf>
2. GM: commits to 100% electric by 2035 (1/28/21), <https://www.forbes.com/sites/samabuelsamid/2021/01/28/general-motors-commits-to-being-carbon-neutral-by-2040/?sh=64e8a5ba6355>
3. Volvo: commits to 100% electric by 2030 (3/2/21), <https://www.media.volvocars.com/global/en-gb/media/pressreleases/277409/volvo-cars-to-be-fully-electric-by-2030>
4. Range Rover Jaguar: commits to 100% electric by 2025 (2/15/21), <https://www.jaguarlandrover.com/reimagine>
5. NPR: Honda commits to 100% electric by 2040 (4/23/21), <https://www.npr.org/2021/04/23/990153361/honda-aims-to-go-all-electric-by-2040#:~:text=via%20Getty%20Images-,A%20Honda%20SUV%20E%20prototype%20is%20displayed%20during%20the%2019th,zero%20emissions%20vehicles%20by%202040.>
6. Uber commits to 100% electric by 2030 (9/7/20), <https://www.uber.com/us/en/about/sustainability/>
7. Lyft commits to 100% electric by 2030 (6/17/20), <https://www.lyft.com/blog/posts/leading-the-transition-to-zero-emissions>
8. Ford commits \$29 billion to EV and AV by 2030 (2/4/21), <https://media.ford.com/content/fordmedia/fna/us/en/news/2021/02/04/ford-raises-planned-investment-ev-av-leadership.html>
9. Bloomberg New Energy Finance: New Energy Outlook (2020):
10. Southwest Energy Efficiency Project (SWEEPS), <https://www.swenergy.org/transportation/electric-vehicles/building-codes#cost>
11. Department of Energy Alternative Fuels Data Center, https://afdc.energy.gov/vehicles/electric_emissions.html
12. Department of Energy, “E-Gallon cost”, <https://www.energy.gov/maps/egallon>
13. Department of Energy, Office of Energy Efficiency and Renewable Energy, “Charging at home”, <https://www.energy.gov/eere/electricvehicles/charging-home>
14. Florida Statute 718.113(8), http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0700-0799/0718/Sections/0718.113.html
15. AAA, “Owning an Electric Vehicle is the Cure for Most Consumer Concerns”, (1/22/20), <https://newsroom.aaa.com/2020/01/aaa-owning-an-electric-vehicle-is-the-cure-for-most-consumer-concerns/>
16. Orlando Community Action Plan (2018), <https://www.orlando.gov/Initiatives/2018-Community-Action-Plan>

APPENDIX

The attached appendix contains a presentation prepared for stakeholders and other interested parties. It gives more information and detail regarding the importance of EV Readiness.



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?

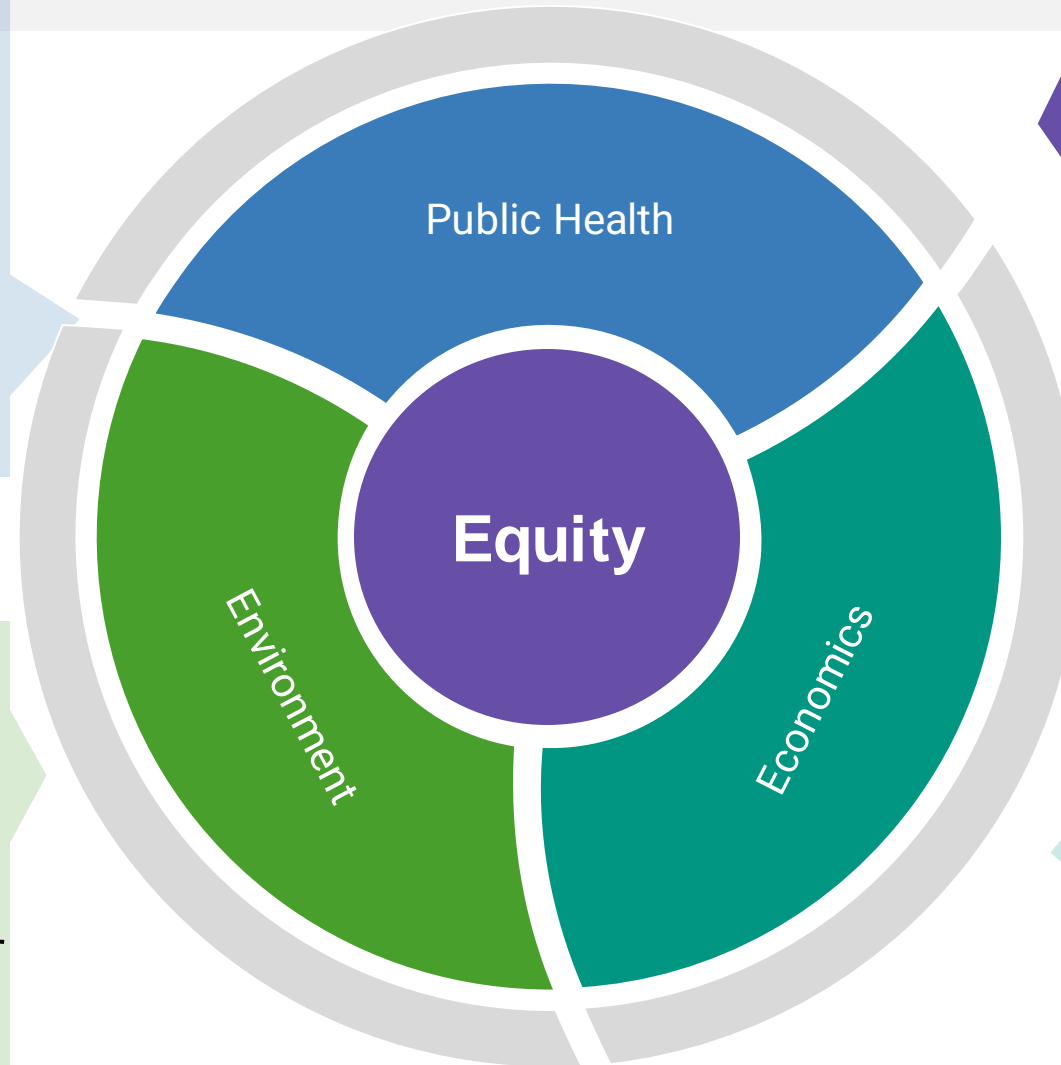
Public Health:

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!*

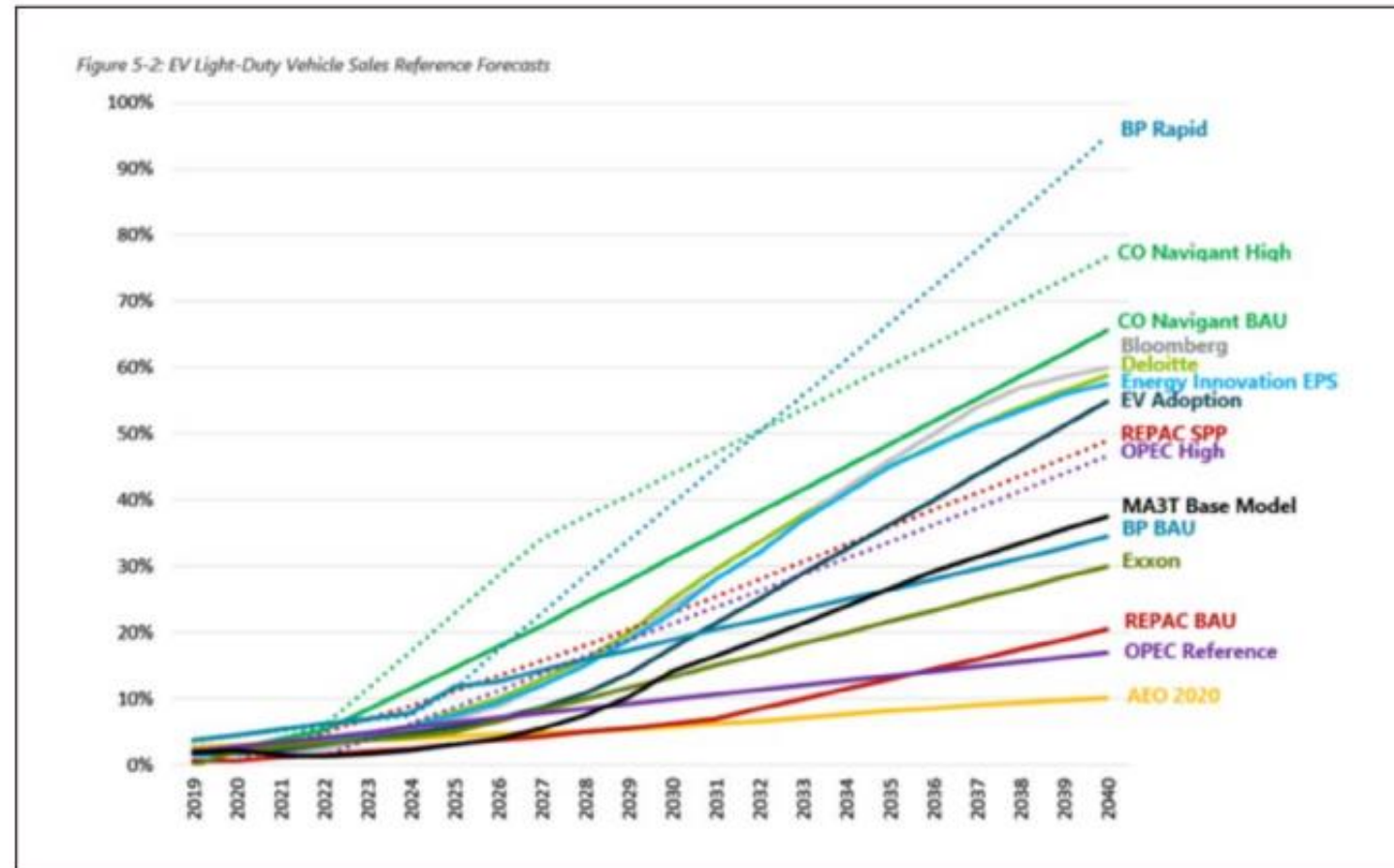
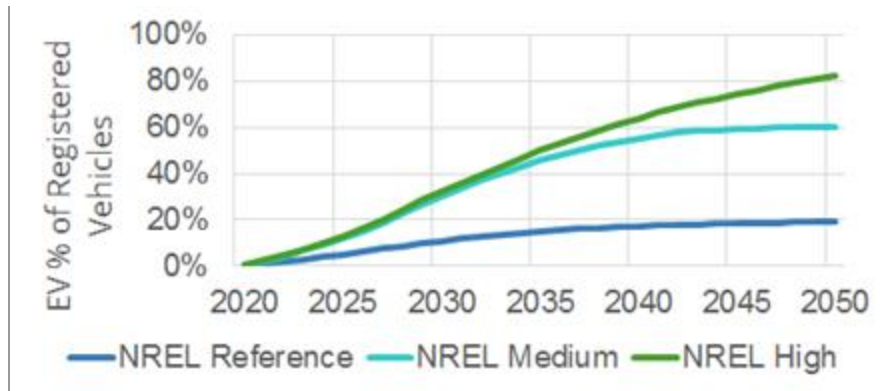
Economics:

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

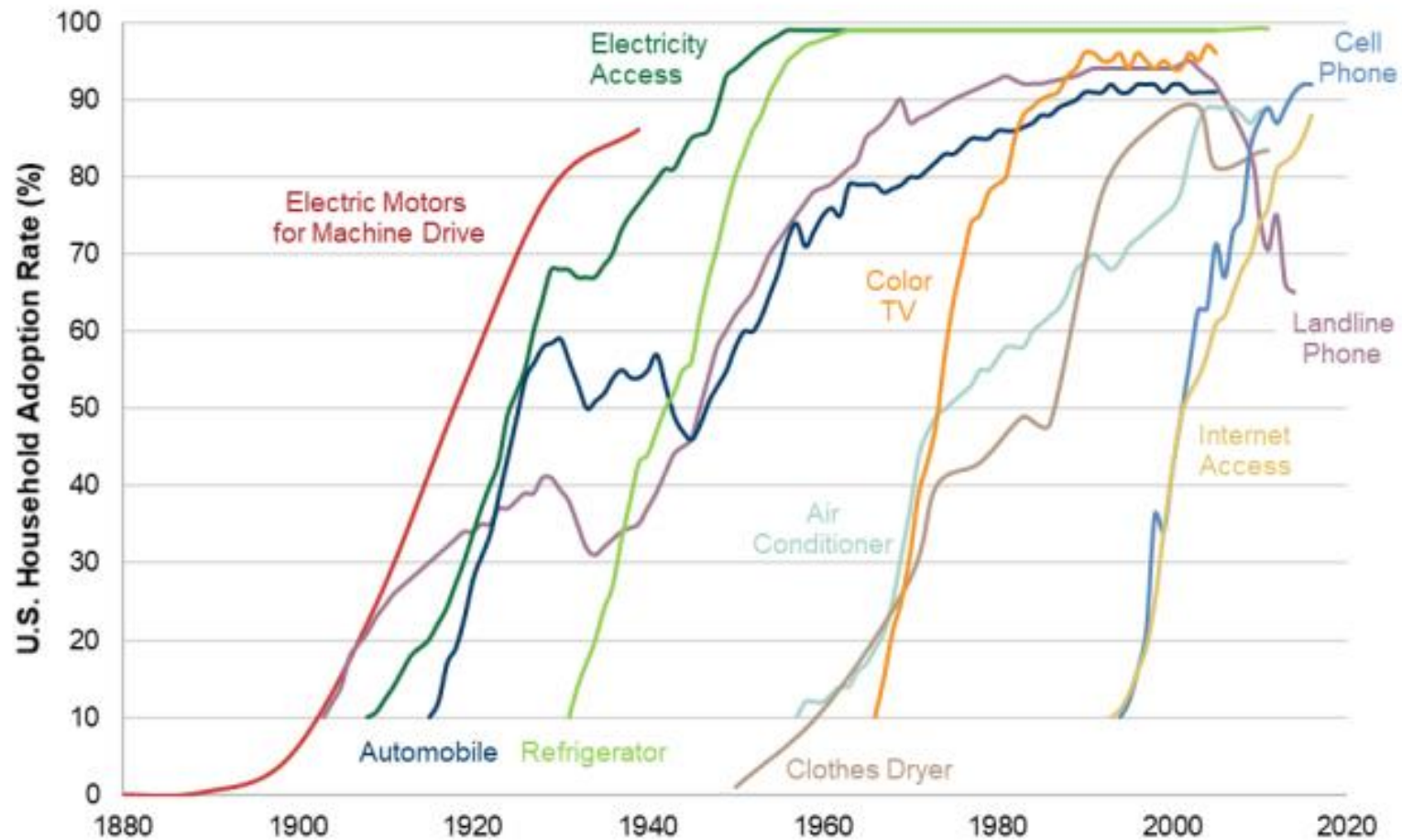


Figure ES-1. Diffusion of various technologies in U.S. households

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



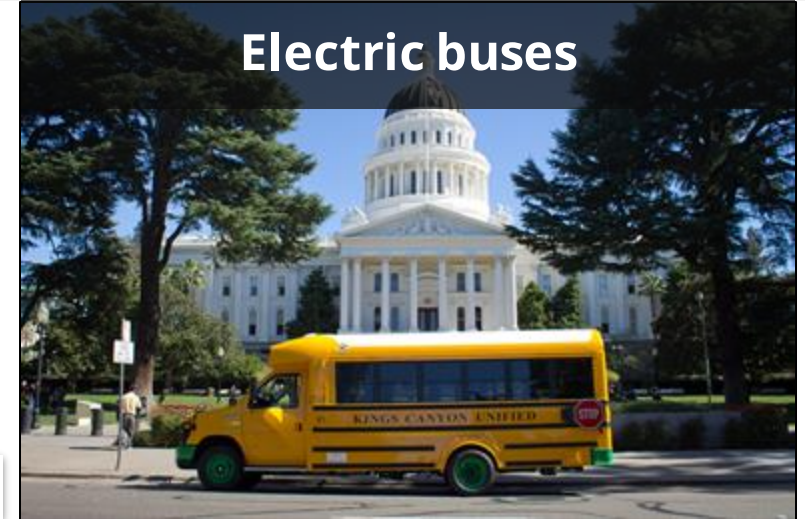
The US is doubling e-bike imports this year to half a million, and even that isn't enough

Electric delivery



Amazon to Add 100,000 Electric Vehicles

Electric buses



Shared electric bikes, scooters, and cars



Electric freight



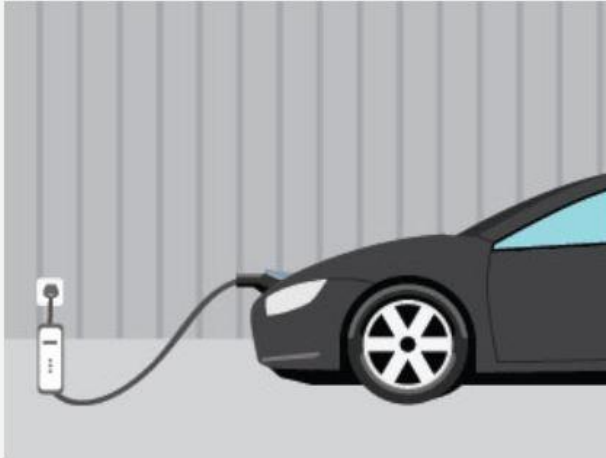
Fifteen states and D.C. pledge 100% zero emission trucks by 2050

Flying e-taxi



EV Charging Speeds

AC Level 1



VOLTAGE:

120V 1-Phase AC

AMPS:

12-16 Amps

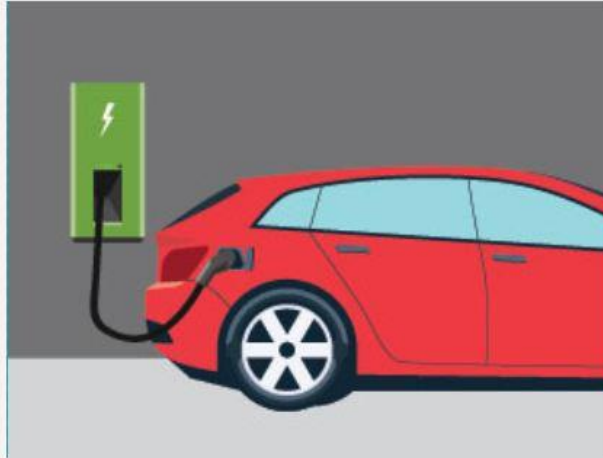
CHARGING LOADS:

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)

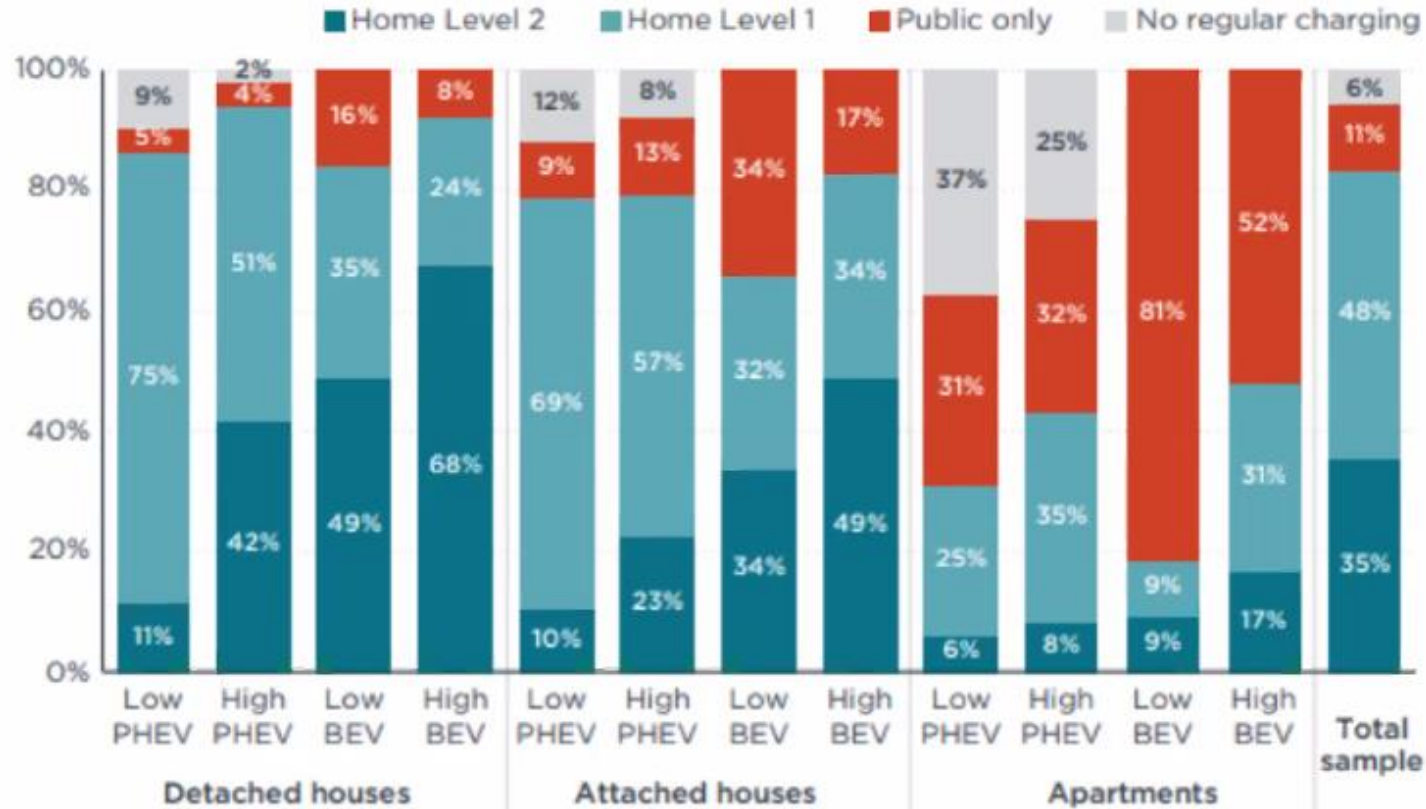
CHARGING LOADS:

<150 kW (Typ. 50 kW)

CHARGE TIME FOR VEHICLE:

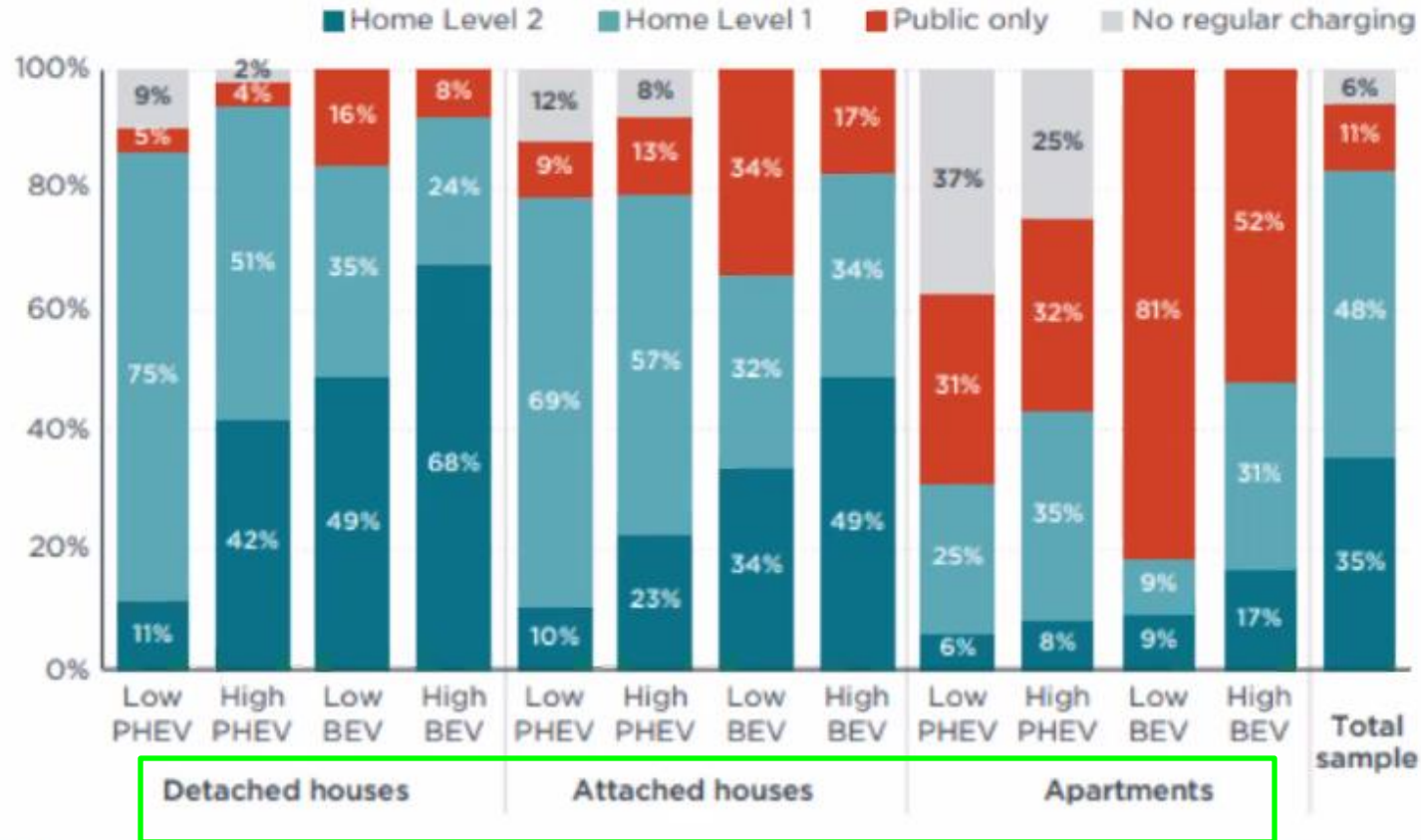
80% Charge in <30 Minutes

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



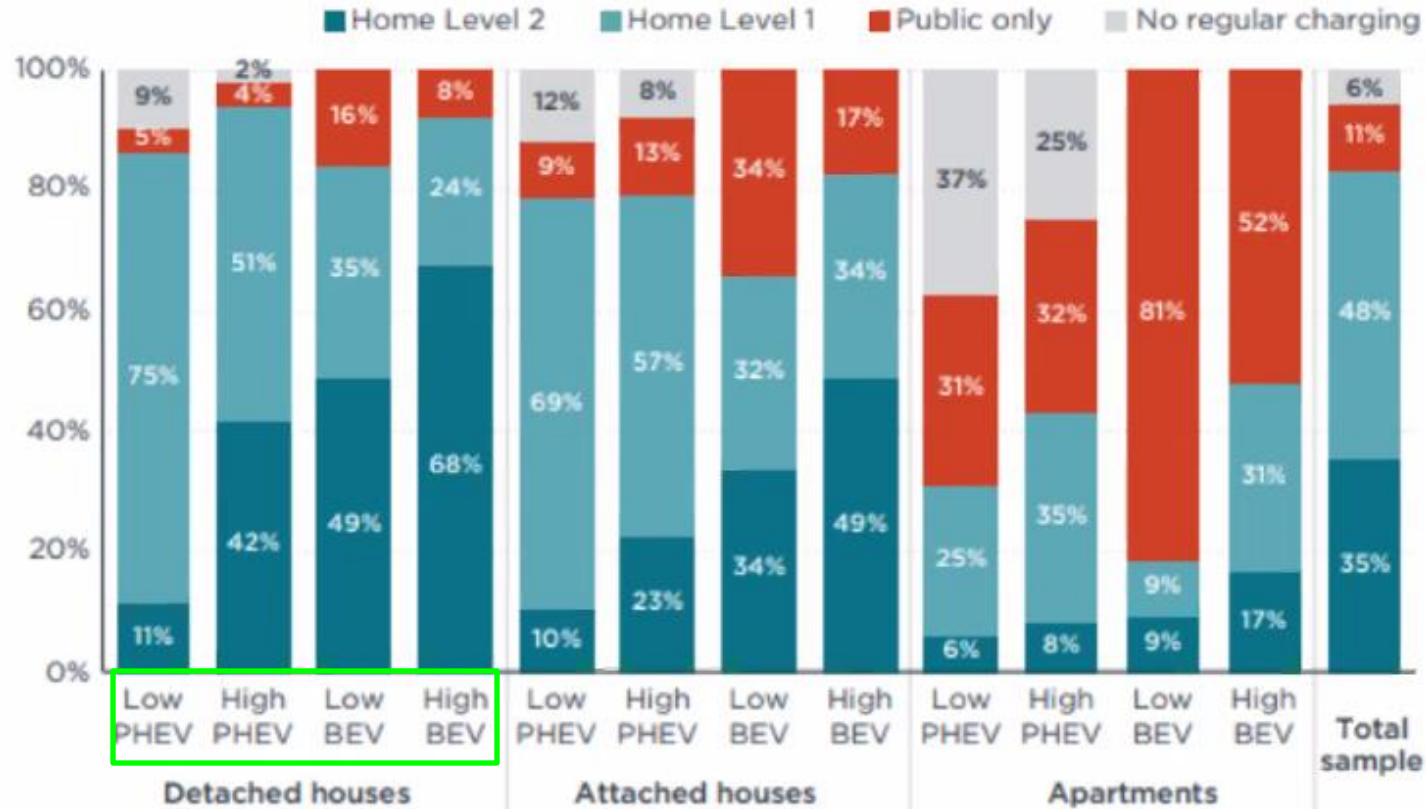
Source: International Council on Clean Transportation, *Quantifying the Electric Vehicle Charging Infrastructure Gap Across U.S. Markets* (January 2019)

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



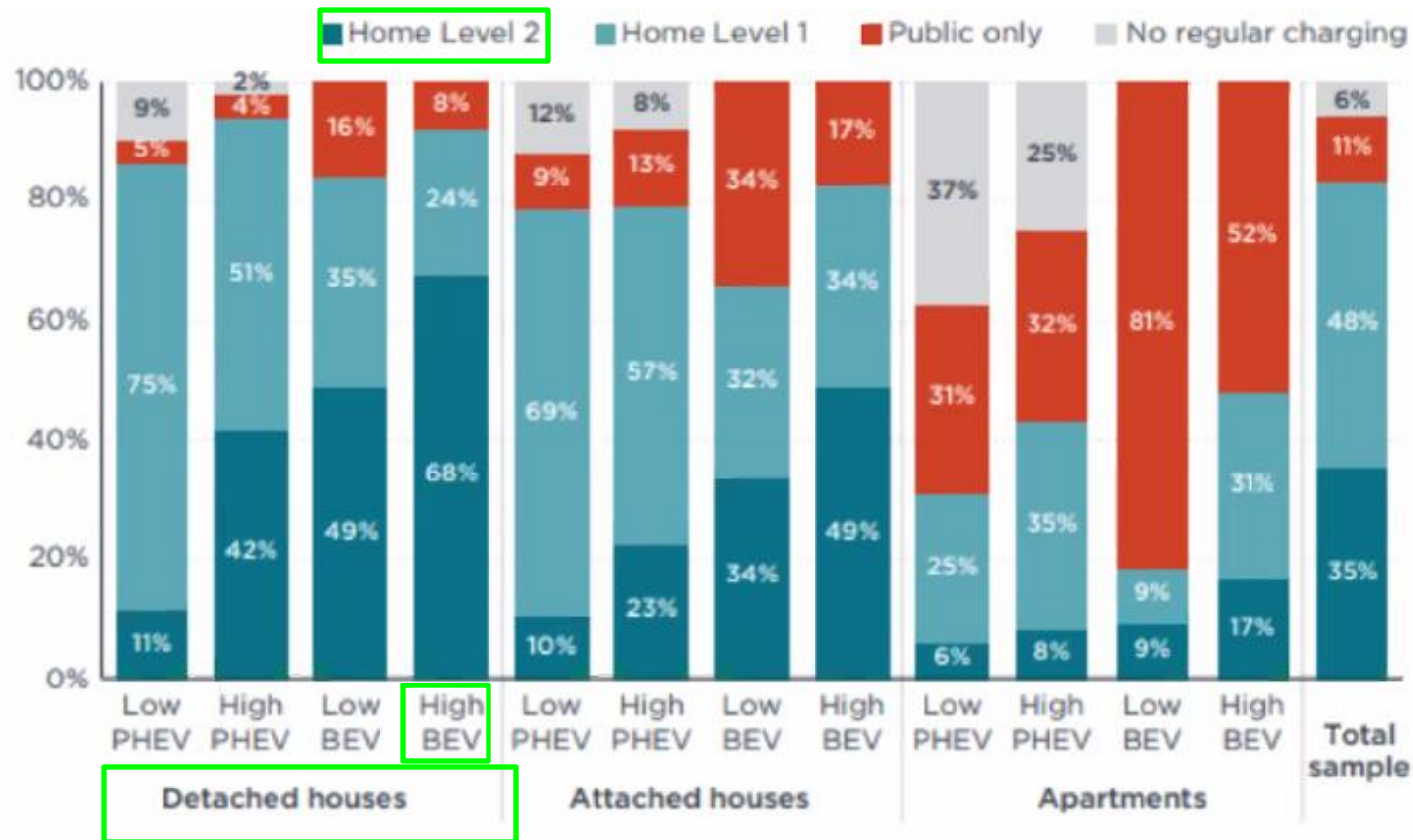
Source: International Council on Clean Transportation, *Quantifying the Electric Vehicle Charging Infrastructure Gap Across U.S. Markets* (January 2019)

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



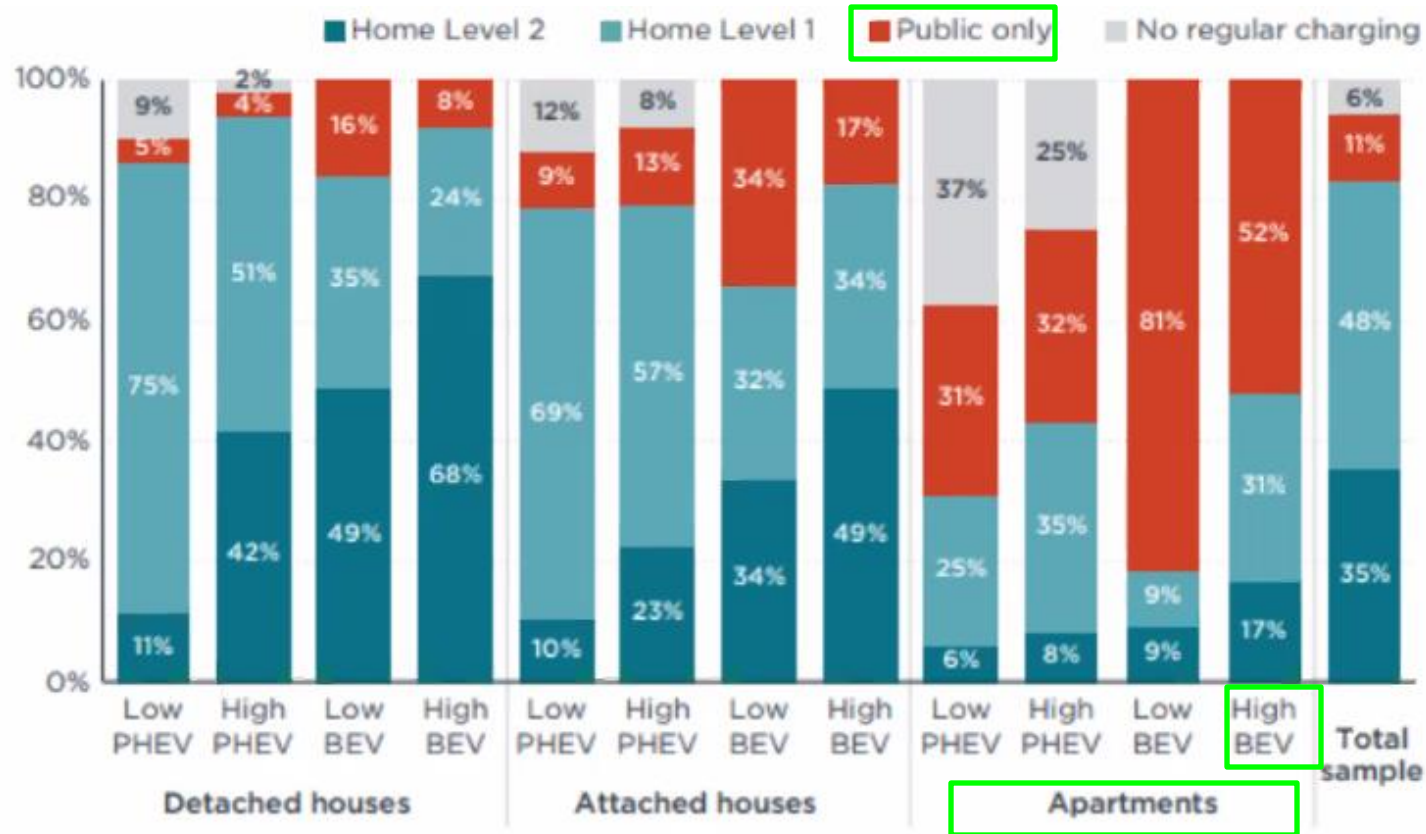
Source: International Council on Clean Transportation, *Quantifying the Electric Vehicle Charging Infrastructure Gap Across U.S. Markets* (January 2019)

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



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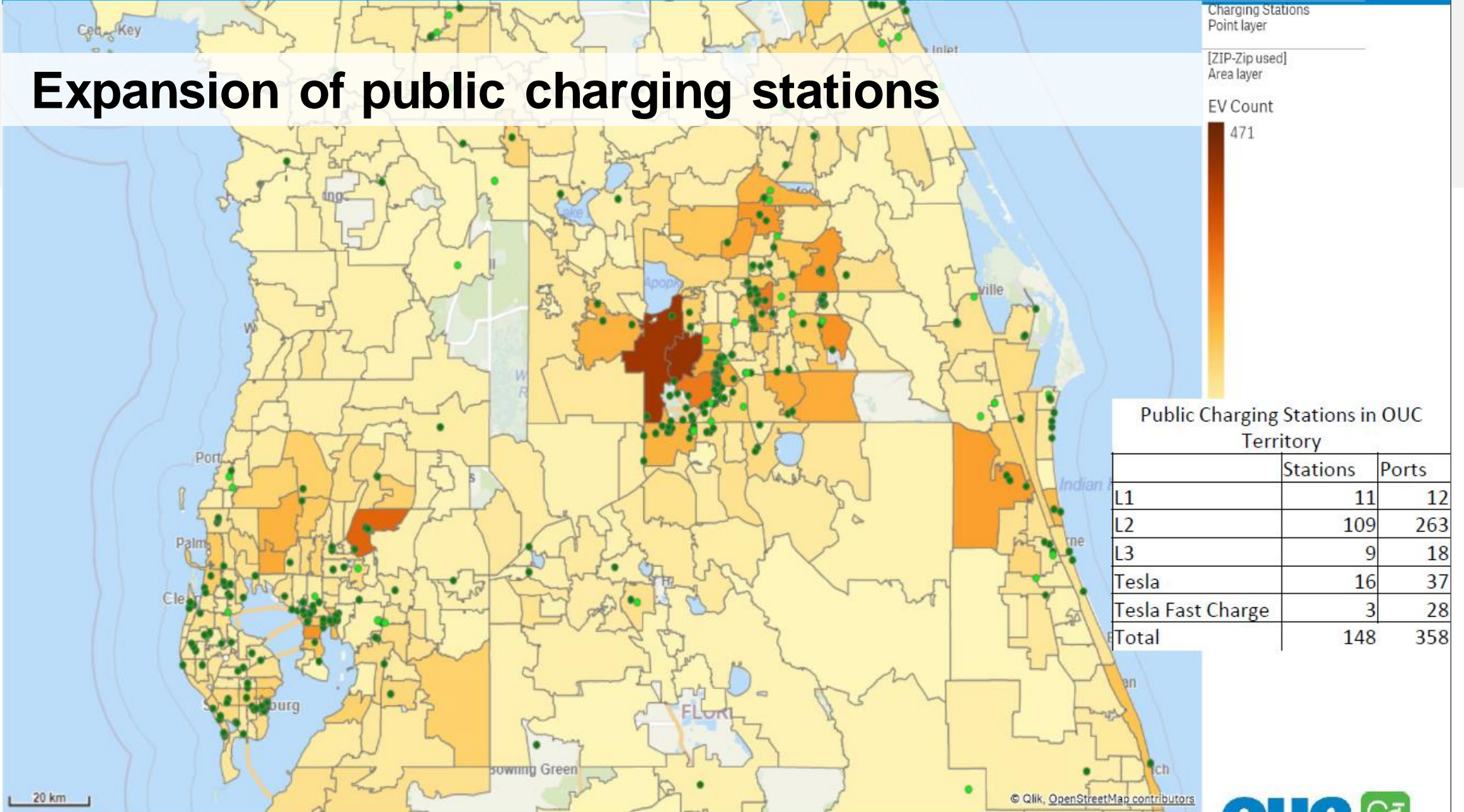


Source: International Council on Clean Transportation, *Quantifying the Electric Vehicle Charging Infrastructure Gap Across U.S. Markets* (January 2019)

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



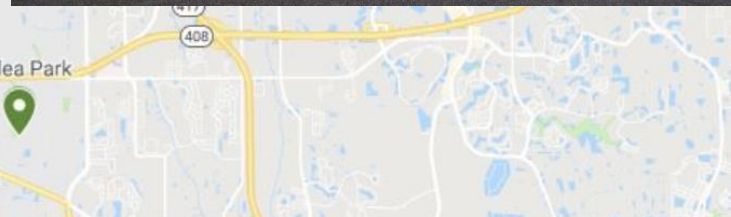
Expansion of public charging stations



* 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

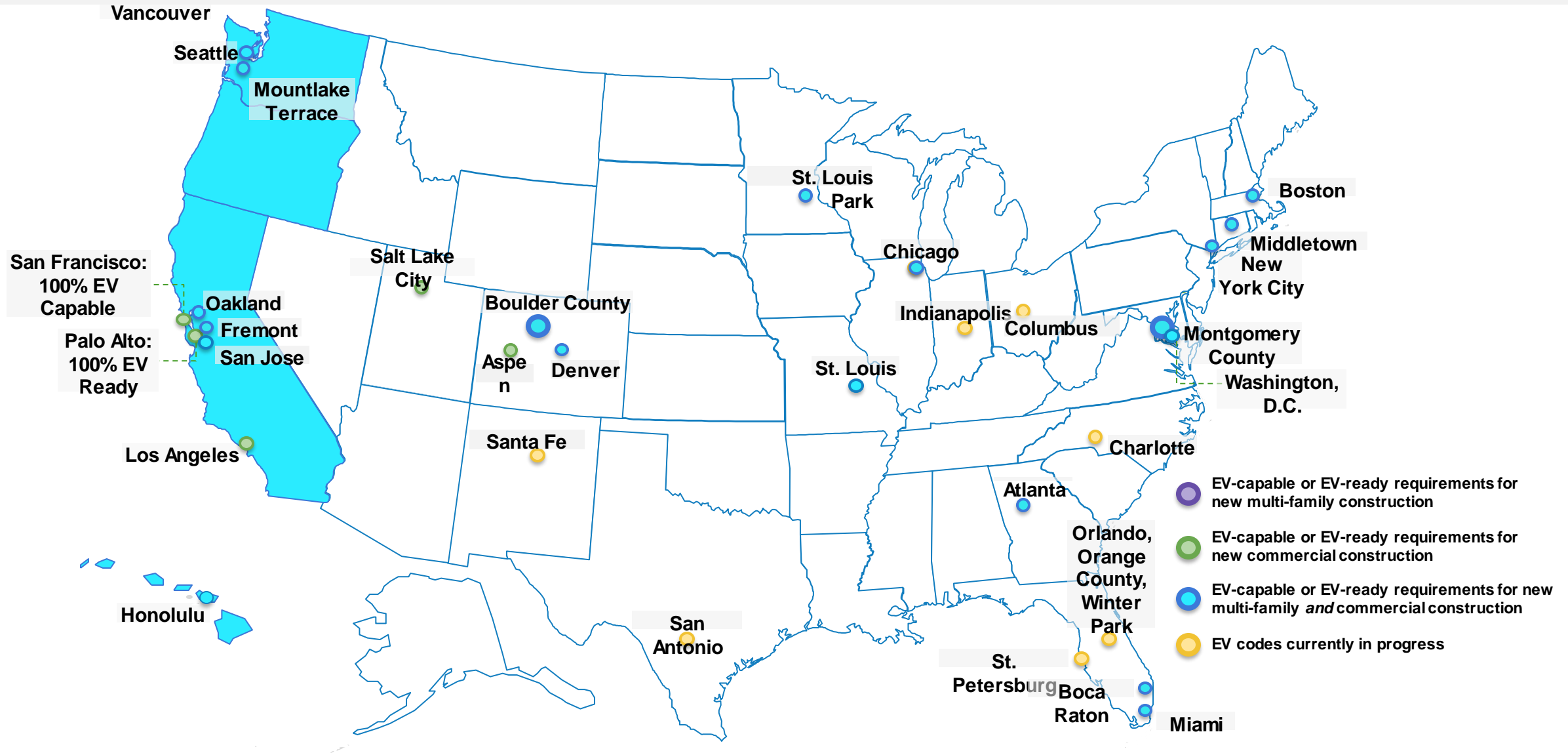


OUC EV Programs

- **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



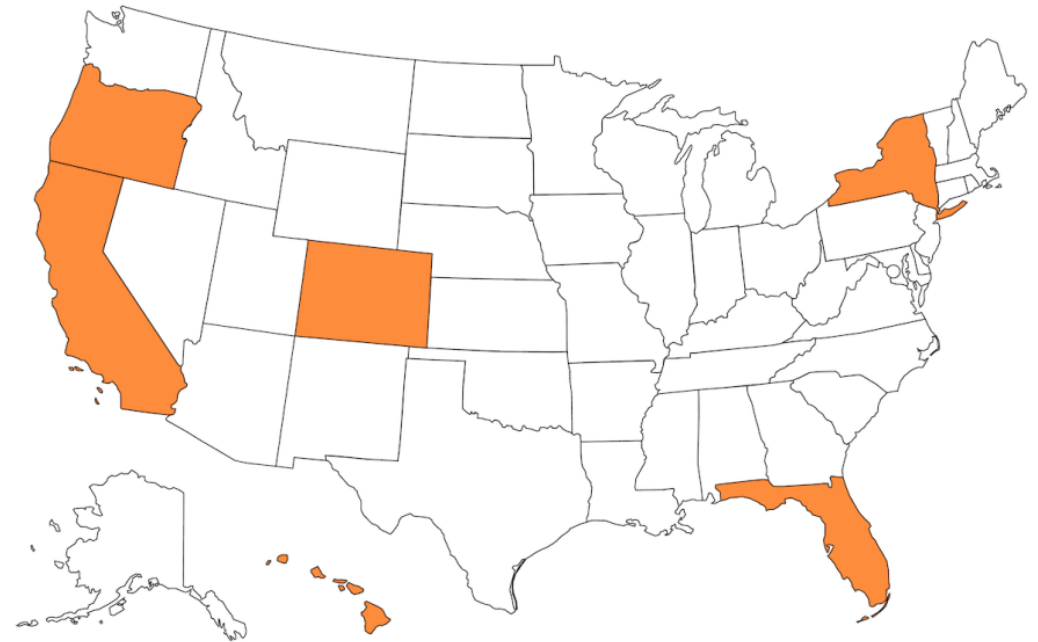
Last year, we shared how cities across the US are preparing with EV Readiness codes... and heard Orlando is in



Florida “Right to charge” legislation for condo owners

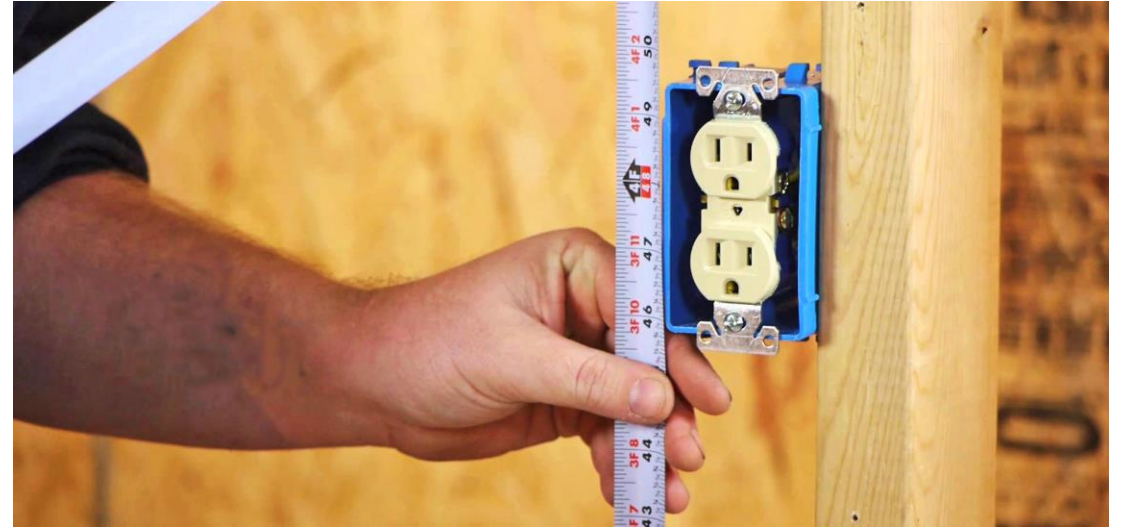
- As of 2019, Condo associations in Florida may not prevent an owner from installing an EV charging station
- Owners may install an EV charging station at their own cost, and within their designated parking space

Florida is one of a few states with this legislation

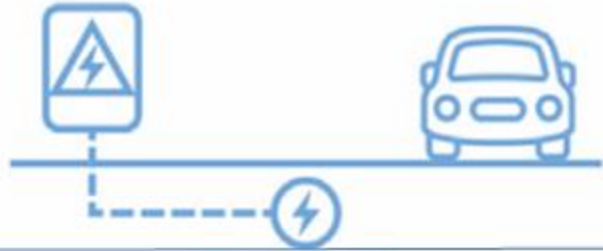


EV Ready (Level 1) required for all Single-Family Homes

- 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



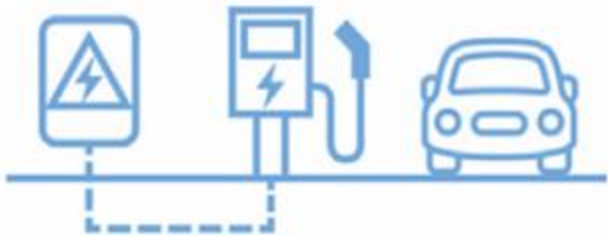
Three tiers of EV Readiness



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).



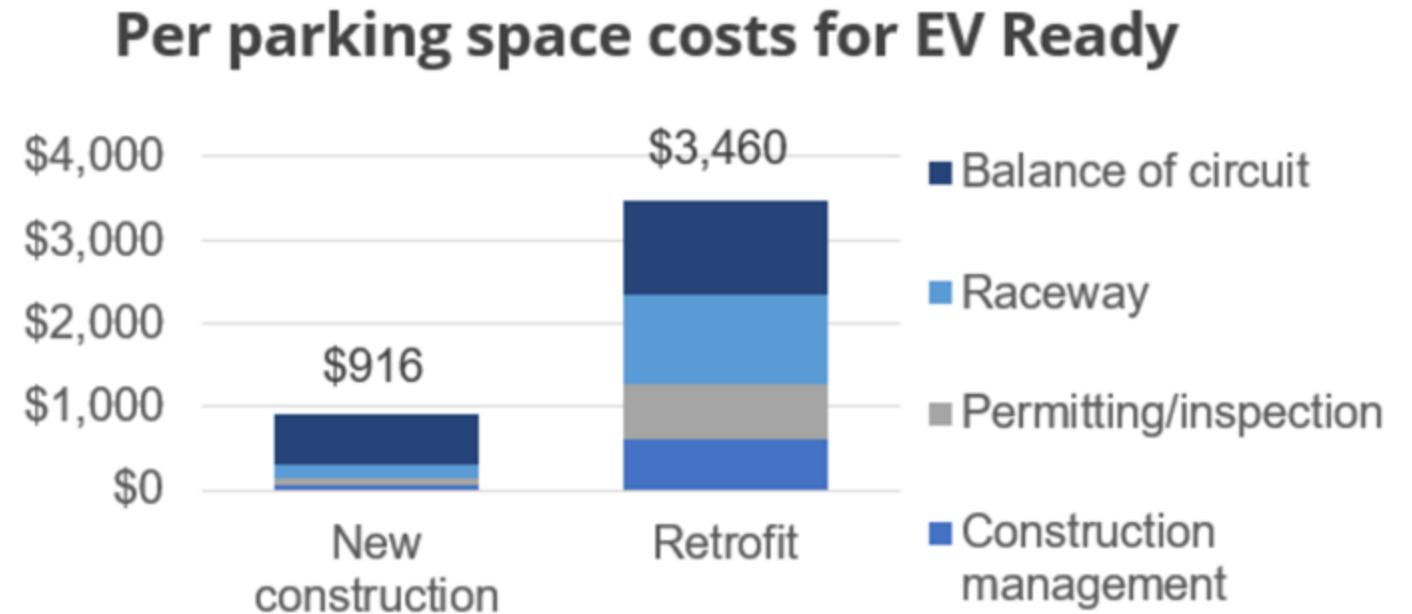
EVSE Installed: Install a minimum number of EV charging stations ([min. 32A](#))



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



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Real Orlando Example – illustrates EV Readiness Impact

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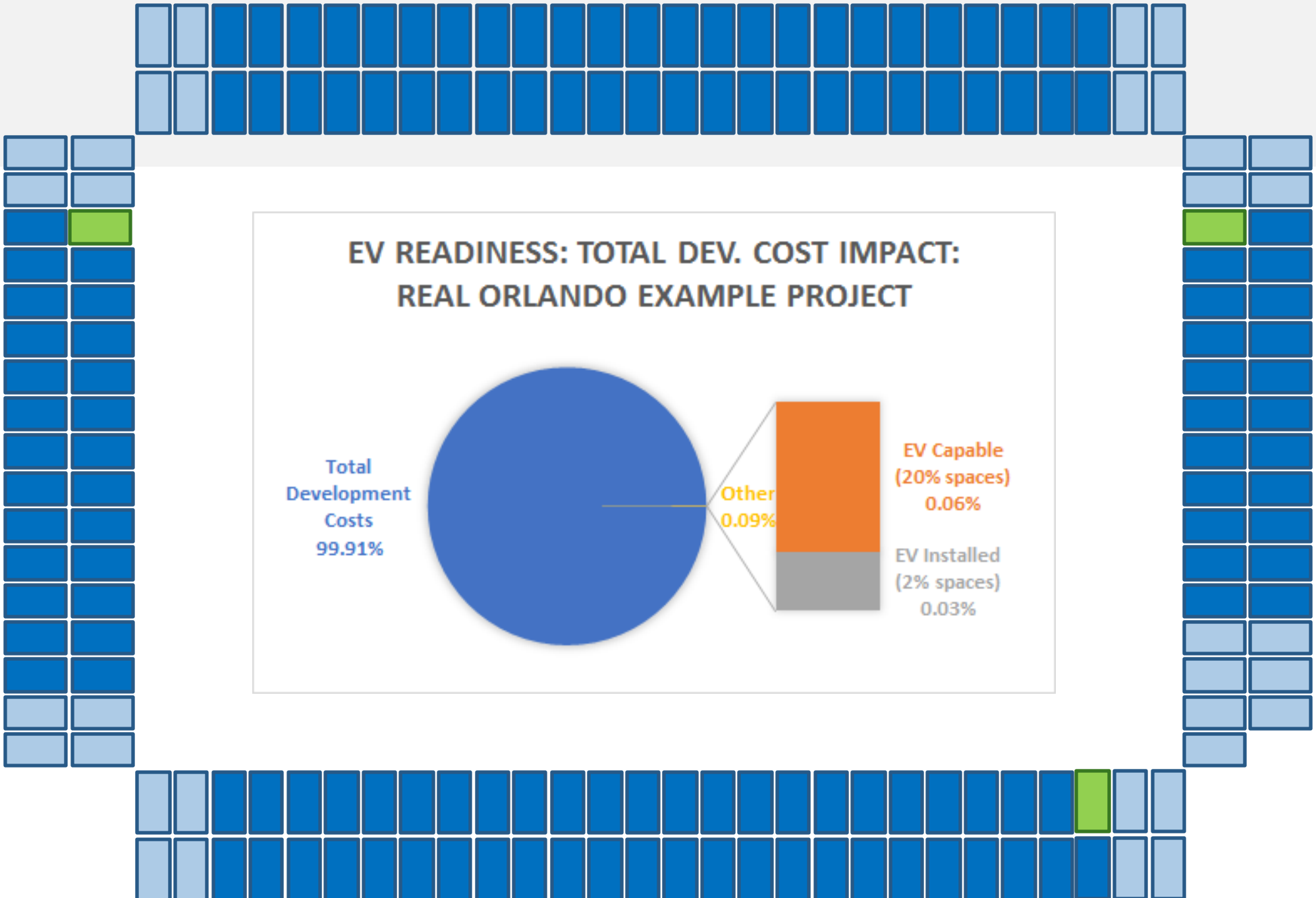
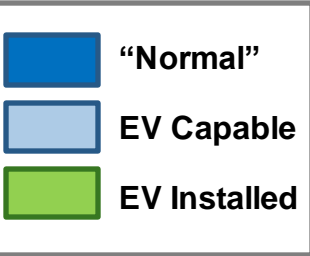
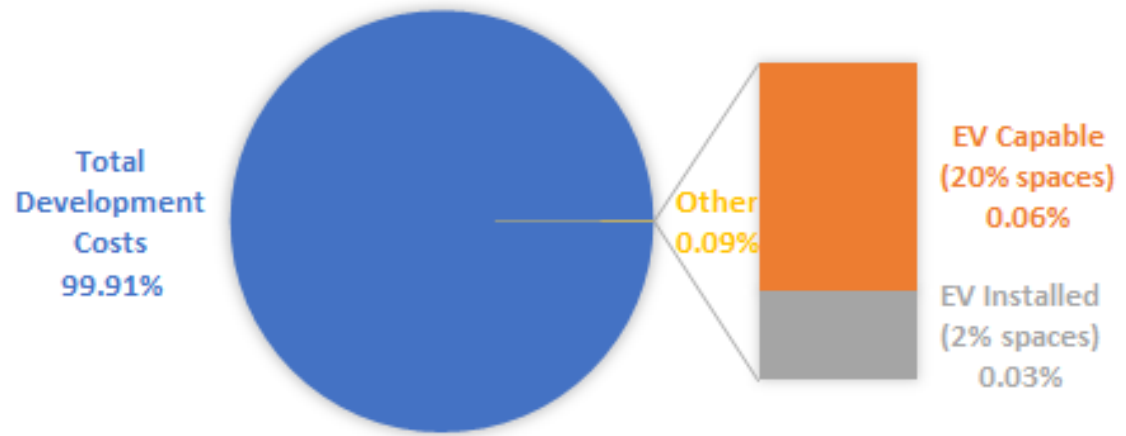
- 20% EV Capable = 38 spaces x \$400/space = \$15,200
- 2% EVSE installed = 3 spaces x \$2,000/space = \$6,000

Total Development Costs: \$23.5MM

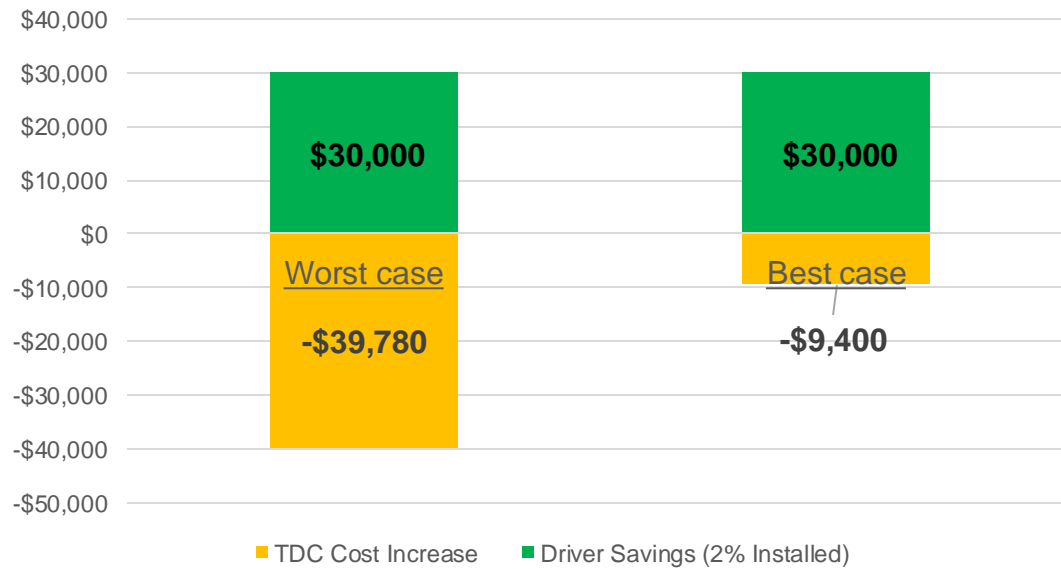
Hard Costs: \$15.2MM

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

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



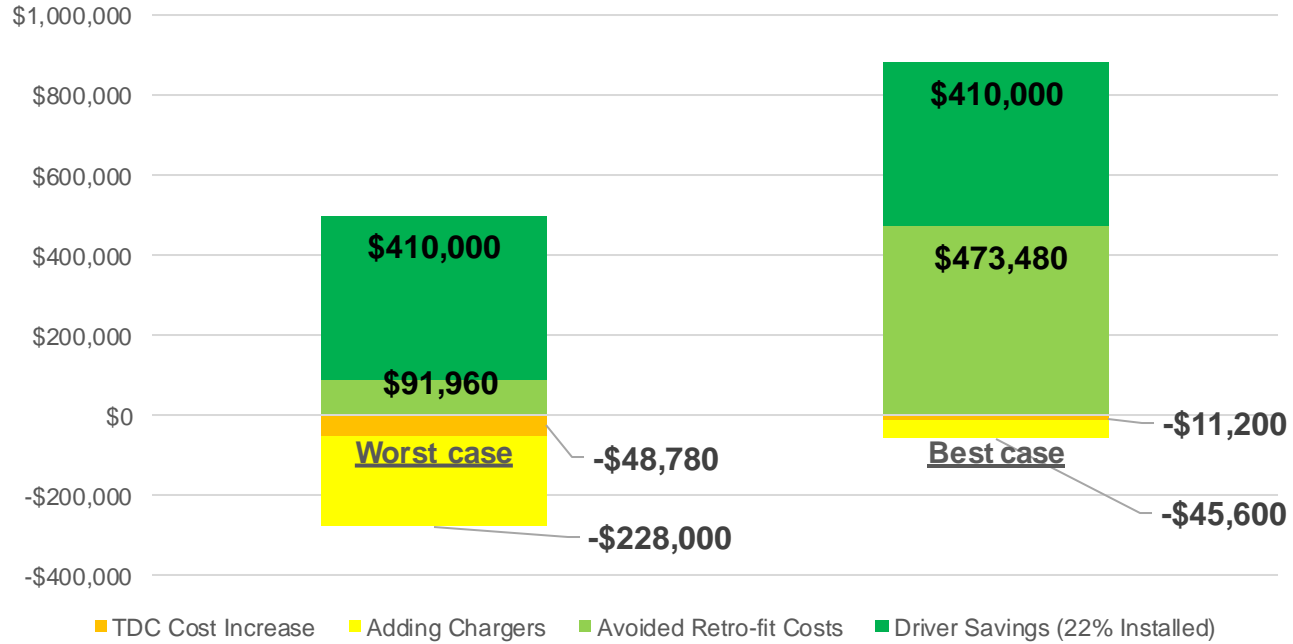
Consumer Savings with EV Readiness (assumes no EV Capable converted to Installed)



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

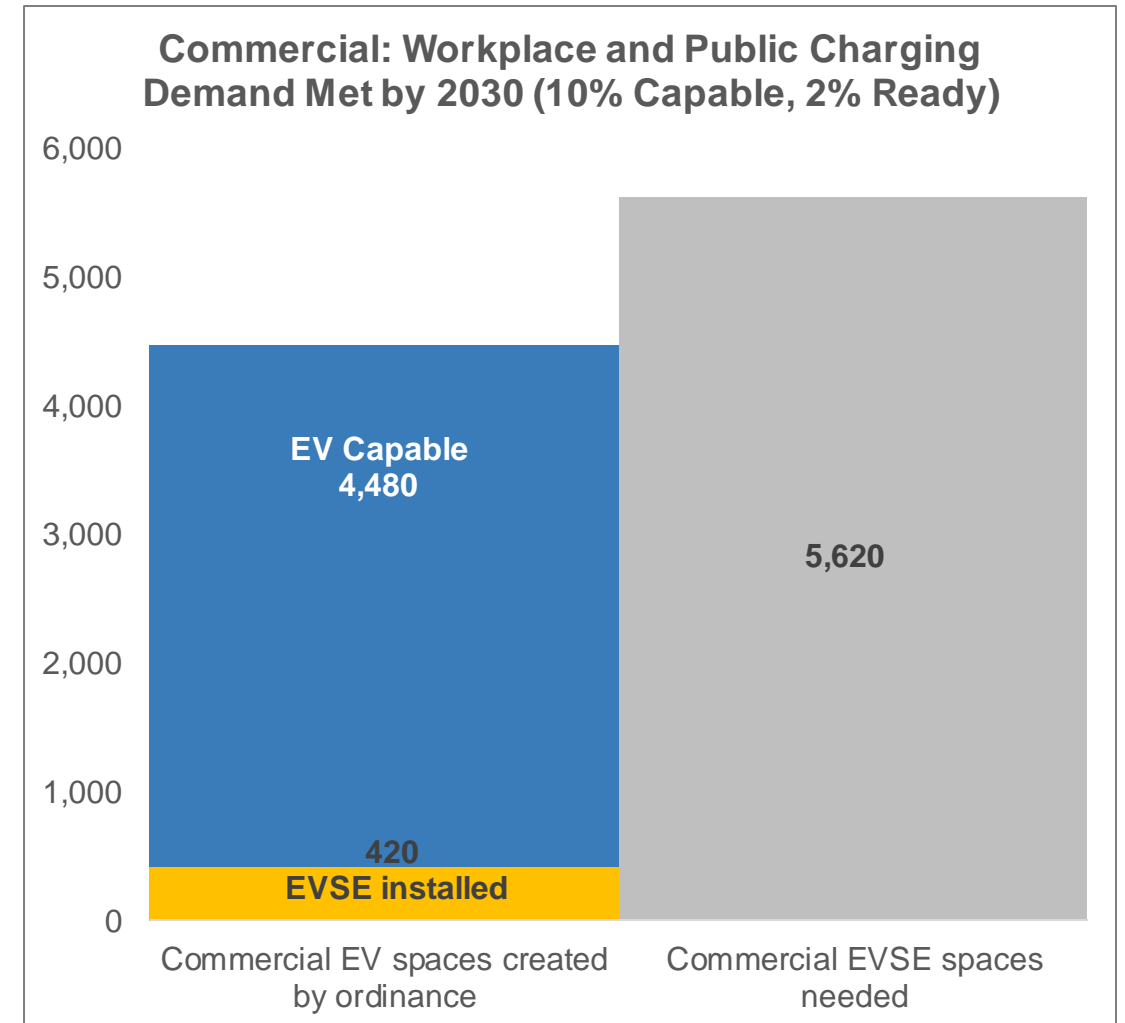
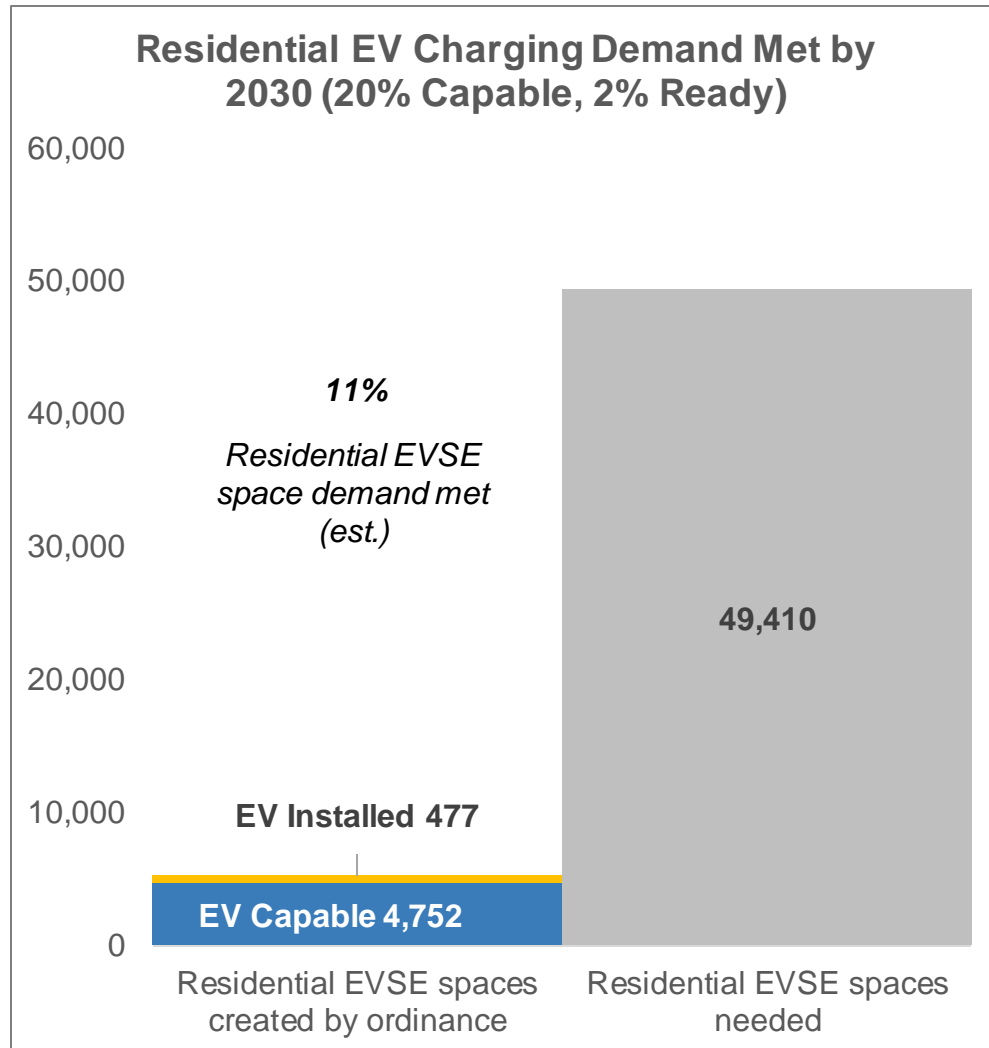
Consumer Savings with EV Readiness (assumes all EV Capable spaces converted to Installed)



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

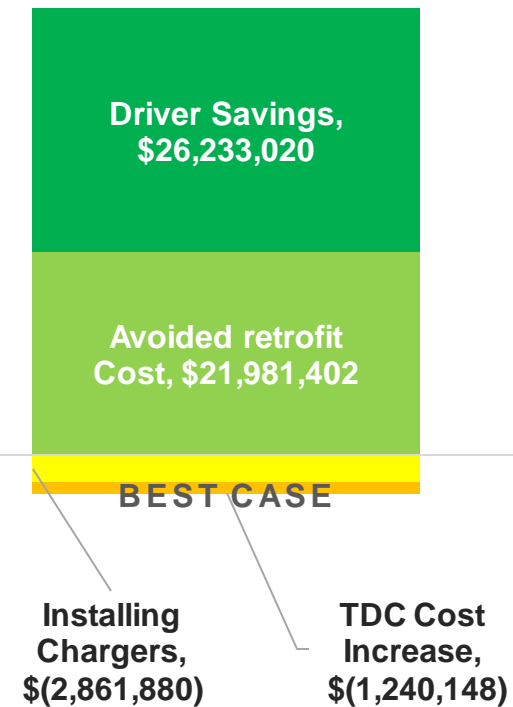
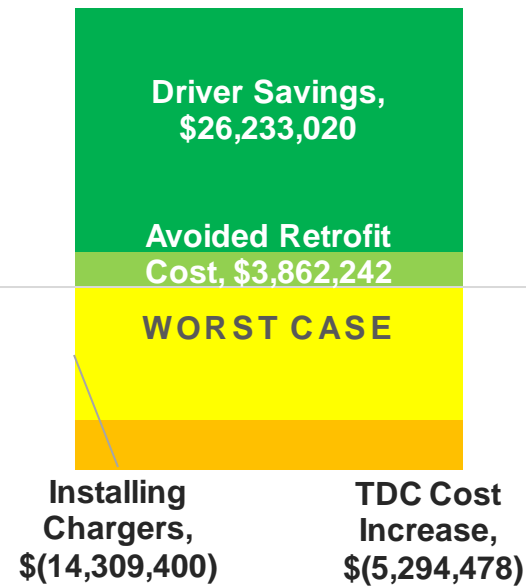
EV READINESS - ECONOMIC IMPACT IN MULTI-FAMILY EST. \$10MM-44MM SAVED

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%).

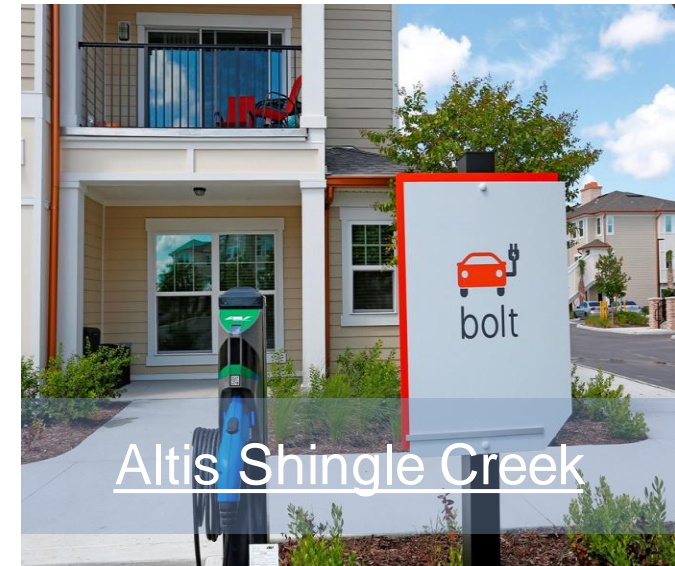
"This [is] in anticipation of a possible market deficit, rather than to address an existing need"

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>
Single Family	EV capable	N/A	N/A	N/A	N/A
Multi-family and Commercial	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	<u>MF and Hotels:</u> 20% Capable; 2% Installed <u>Affordable (MF) housing:</u> 20% Capable; <u>Commercial (non-res):</u> 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**:

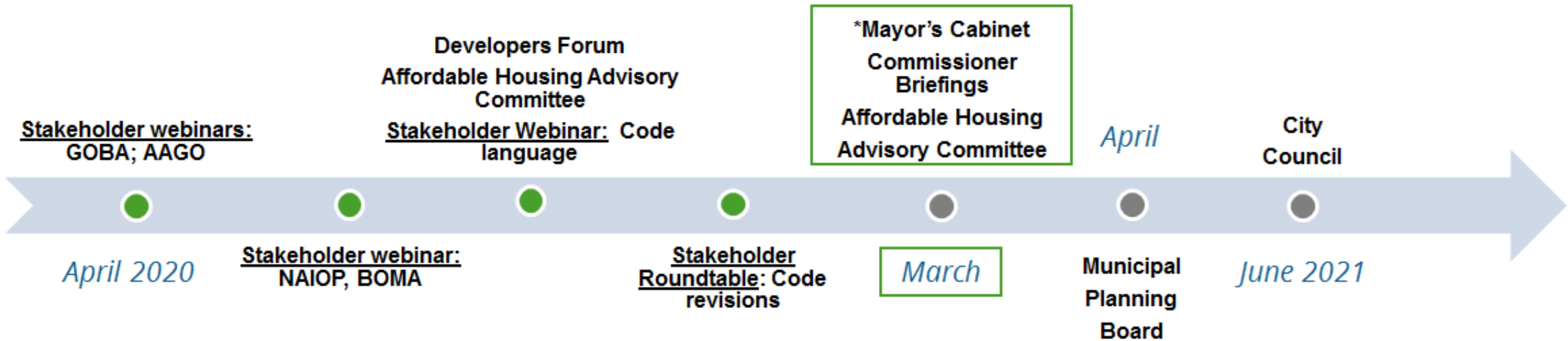
<u>Type</u>	<u>EV Capable</u> <u>(40A min. per</u> <u>two spaces)</u>	<u>EVSE Installed*</u>
Single Family, Duplex, Townhouse -	—	—
Certified Affordable Multi- family Housing	20%	-
Multifamily, Hotel, all parking structures	<u>20%</u>	2% (requirement begins at 50 spaces)
Non-residential (offices, retail, 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"

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)	20% <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.

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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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.

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 2030.¹ 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 2024.²
- 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.³
- 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!⁴ 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 Dakeland, 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.⁵

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/ev-costs-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	Revisions, Facts, and Clarifications
"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 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?

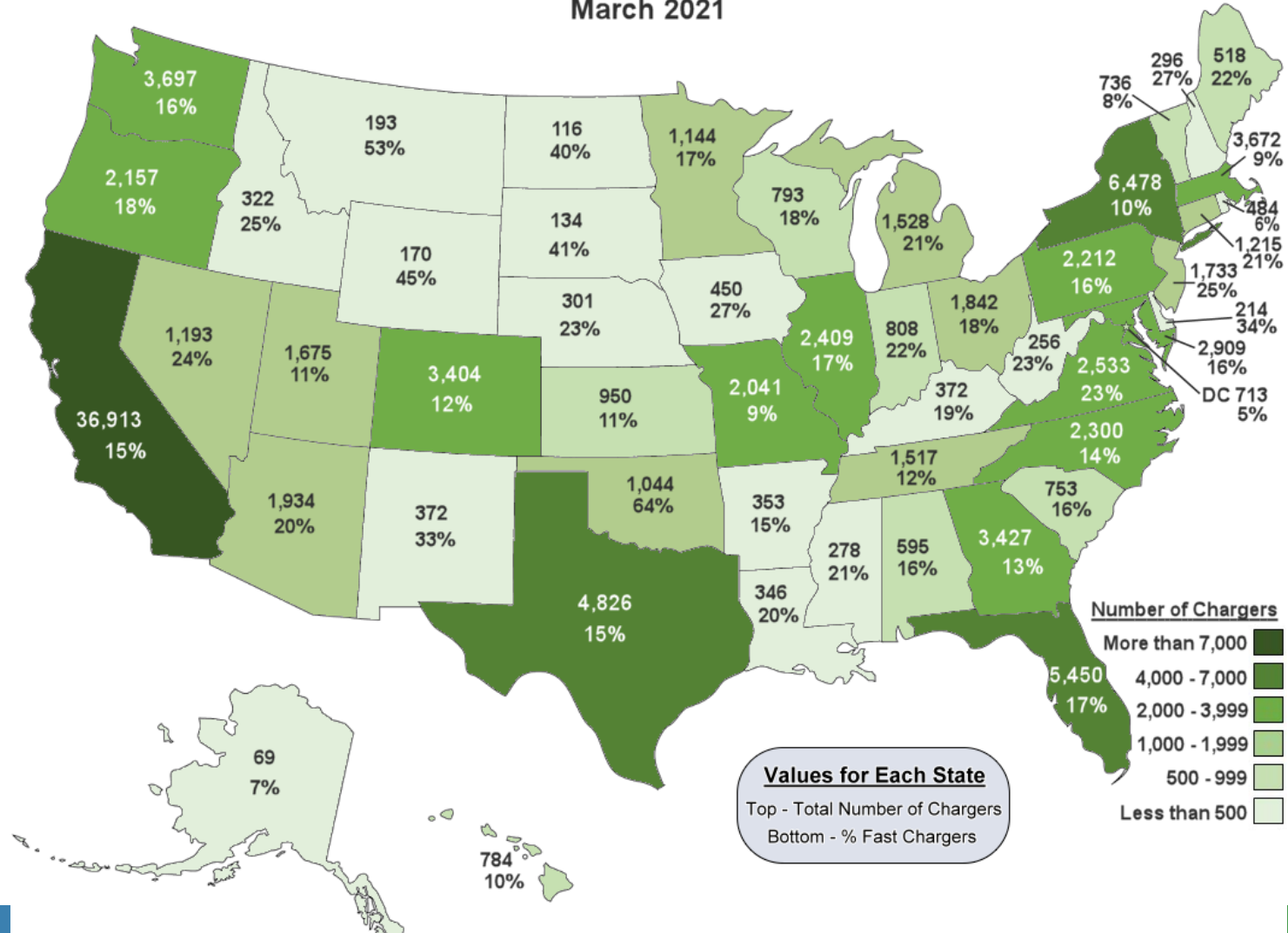
	Miami-Dade County, FL (2019)	Broward County, FL (2017)	Central Florida, FL (2018)	Atlanta, GA (2018)	San Jose, CA (2018)	Denver, CO (2020)
Single Family	N/A	N/A	N/A	EV Capable	EV Ready	EV Ready
Multi-family	10% EV-Ready (1-2022) 20% EV-Ready (1-2022) (min. 10 spaces)	EV Capable elements 2% EVSE installed	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
Commercial (non-residential)	(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...

