

Transportation Electrification Working Group

June 2, 2022



AGENDA

1. Introductions
2. Working Group Update
3. City of Orlando EV Readiness Code —
City of Orlando Director, Office of
Sustainability & Resilience
Chris Castro, LEED GA
4. Q&A: Public and Interested Parties
5. Next Steps



INTRODUCTIONS

MEMBERS

- CHISPA
- City of Boulder City
- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clark County
- Clark County School District
- NAIOP
- NV State Apartment Association
- NV Energy
- NV Resort Association
- Ovation Development
- Regional Transportation Commission
- Southern NV Water Authority
- Southern NV Home Builders Association
- NV Division of Environmental Protection
- NV Climate Initiative
- NV Governor's Office of Energy
- NV Department of Transportation
- Southwest Energy Efficiency Project
- The Electrification Coalition
- Western Resources Advocates



Questions?

Post questions in the chat or raise your hand.

Time reserved for Q&A and discussion.



WORKING GROUP OVERVIEW

April Bolduc
S Curve Strategies

WORKING GROUP

- Understand TE goals
 - EV and charging
- Discover current TE efforts
 - Survey performed
- Uncover barriers
 - Working Group, Survey, Discussions
- Provide solutions based on best practices
- Develop a model EV charging infrastructure ordinance
- Develop an equitable strategic plan that will meet goals



CITY OF ORLANDO EV READINESS ORDINANCE

Chris Castro
City of Orlando
Director, Office of Sustainability & Resilience



EV Readiness Code Policy Overview

Chris Castro
Director, Office of Sustainability & Resilience
City of Orlando, FL

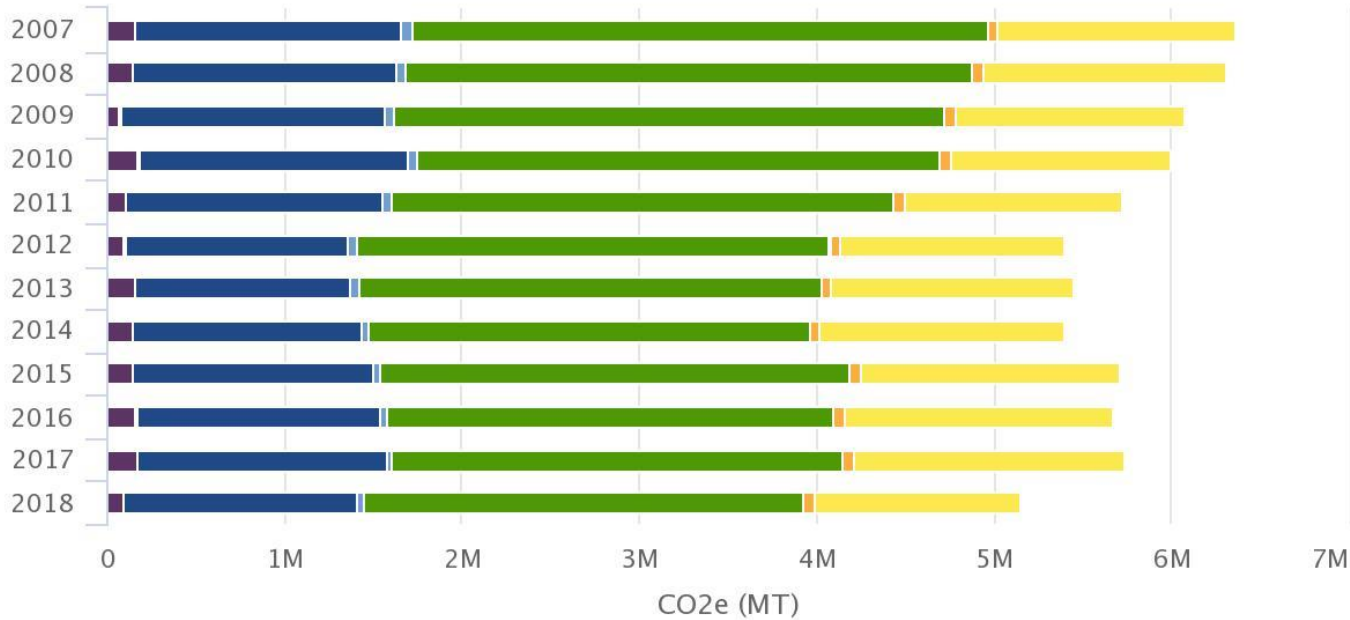
Green Works Orlando

Office of Sustainability & Resilience

- Award-winning sustainability program called “**Green Works Orlando**” launched by Mayor Buddy Dyer in 2007
- Develops internal and citywide policies + programs to:
 - Protect natural resources and the environment (air, water, land)
 - Improve public health and social equity
 - Create green economic dev. and green jobs opportunities
 - Decrease air pollution and carbon emissions
 - Enhance city resilience and adapt to climate change impacts
 - Reduce operational expenses and enhance efficiency
 - Educate the residents and businesses on sustainable practices
- Focuses on 7 key areas:
 - Clean Energy
 - Green Buildings
 - Local Food Systems
 - Zero Waste
 - Livability
 - Clean Water
 - **Electric & Alternative Transportation**



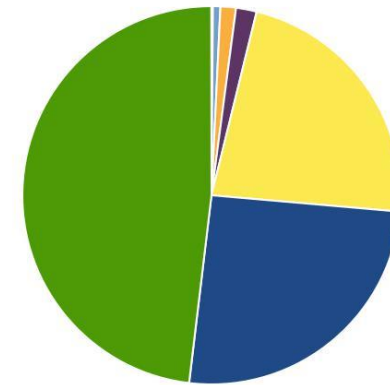
Orlando's Citywide yearly emissions by sector / source



ClearPath
AN ICLEI USA TOOL

EDF ENVIRONMENTAL DEFENSE FUND | CLIMATE CORPS

CO2e By Category



- Upstream Impacts of Activities ● Process & Fugitive Emissions
- Residential Energy ● Industrial Energy ● Commercial Energy
- Water & Wastewater ● Solid Waste ● Transportation & Mobile Sources

- Water & Wastewater ● Process & Fugitive Emissions ● Industrial Energy
- Solid Waste ● Upstream Impacts of Activities
- Transportation & Mobile Sources ● Residential Energy ● Commercial Energy

Benefits of EV's – People, Planet, Prosperity



Public Health: improve air quality and public health. Vehicles contributing 85% of carbon monoxide (CO) emissions and 73% of nitrogen oxides (NOx) in Orange County



Climate action: City of Orlando has a 2040 goal to reduce 90% of greenhouse gas emissions; Net-zero by 2050 – transportation fuels (i.e. gasoline) contribute 20% of current emissions.



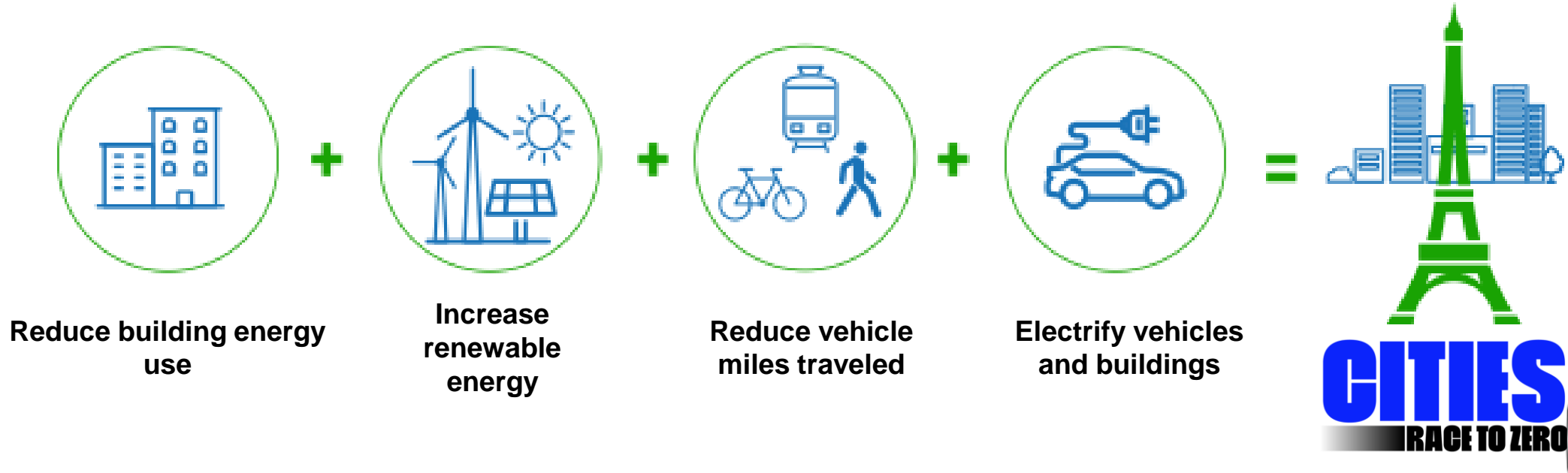
Direct economic benefits: EV drivers save over \$1,000/year in operation and maintenance costs; and property owners to avoid future costly parking space retrofits.



Local economic development: EV's help keep our local dollars in Orlando by purchasing electricity from the local utility, OUC.

Orlando's Climate Action Strategy

Through the **American Cities Climate Challenge**, the City of Orlando has launched an effort to accelerate and deepen our climate actions to create the greatest climate impact through 2030 and showcase the benefits – **good jobs, cleaner air, and cost savings** – that climate solutions brings.



The "market" has spoken, and we hear that vehicles will be all-electric and soon.

CNBC
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

CAR AND DRIVER
I Powered My House with the Ford F-150 Hybrid

TECH | TRANSPORTATION | CARS
Ford is more than doubling its investment in electric and autonomous vehicles to \$29 billion

SCIENCE | BUSINESS | TECH
Lyft vows '100 percent' of its vehicles will be electric by 2030

For example, in the Bronx, the median income of just \$40,000, the city has a large population of people who live in poverty. That oversight has real implications for the future of the city. "Alley," a portion of the city's population are five times as poor as the rest of the city. Neighborhoods in New York City are facing a crisis.



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



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

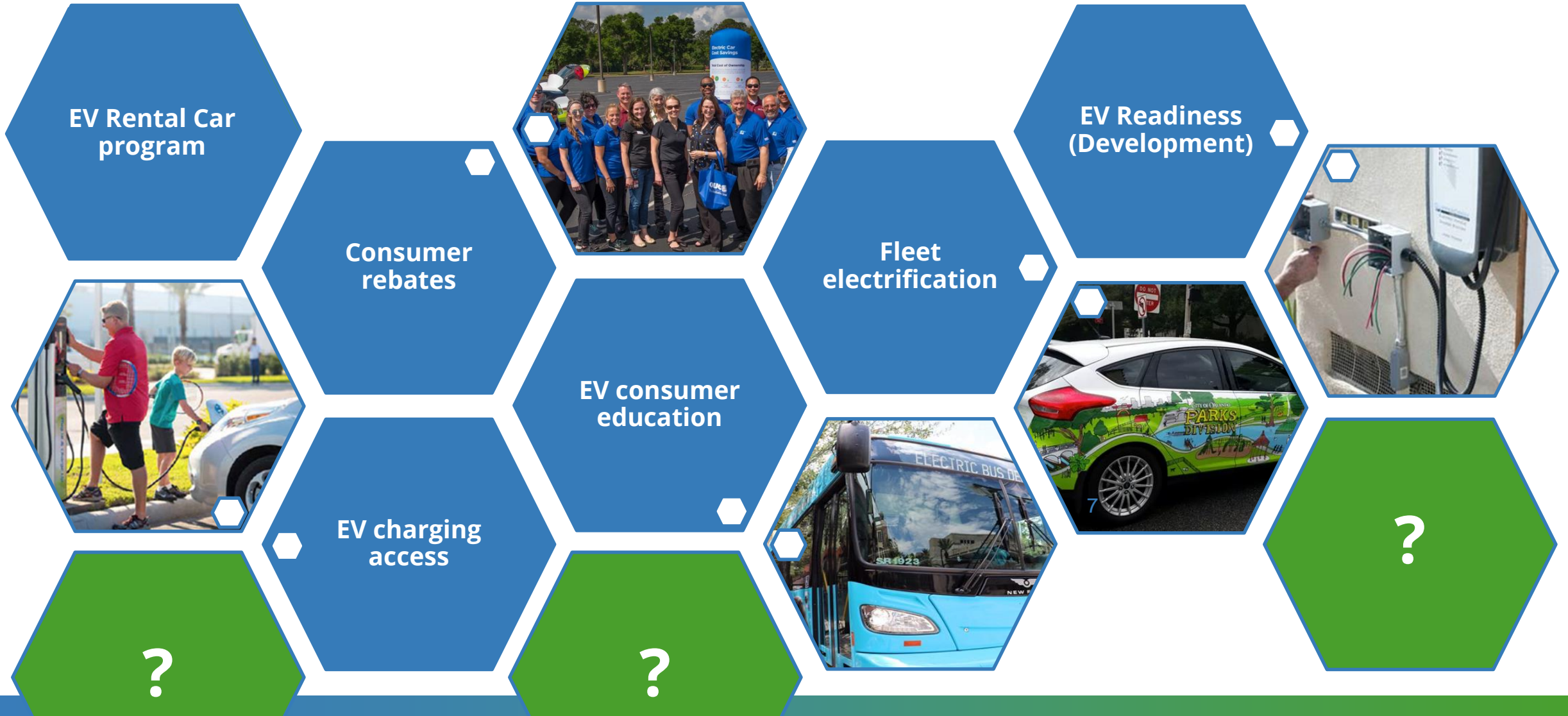
Volvo says it will make only electric cars by 2030
With New Electric Vehicle



TECHNOLOGY NEWS | JANUARY 15, 2018 | REUTERS
Global carmakers to invest at least \$1 billion in electric vehicles

npr
BUSINESS
Honda Aims To Go All-Electric By 2040
APRIL 27, 2021 2:08 PM ET

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



Municipal EV Fleet - ~3,000 vehicles

- **Goal:** 100% Electric and Alt. Fuel for all City Fleet by 2030
- **200+ EV & Hybrids in City Fleet**
 - Chevy Bolts EV's for City Hall motor pool
 - Nissan Leafs
 - EV Motorcycles for OPD
 - Solar golf cart pilots
- Submitted LOI for 100 F-150 EV Trucks
- **Fleet Electrification Study with EC and ATLAS**
- **EV Purchasing Collaborative with Climate Mayors**



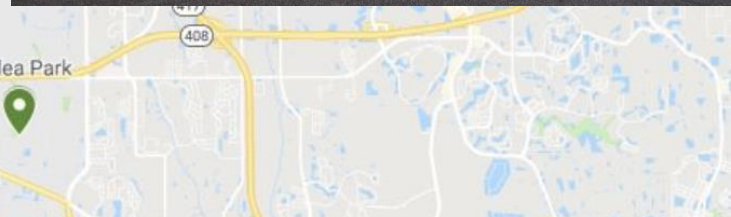
Lymmo Electric Bus Expansion

- **Goal:** 100% of Lymmo BRT powered by zero-emission EV by 2025
- Added 8 new EV buses in 2021; 6 more in 2022
- 100% Grapefruit, Lime, and partial Orange lines



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.



ADA Accessibility was major lesson learned!

EV Recharge Hubs



Downtown Orlando. 22 DCFC stations, up to 350 kW chargers.

Ride & Drive events

Launch: Quarterly

Purpose:

- Encourage residents and businesses to test ride various EV models
- Provide opportunity for test-rides without the pressure of buying or leasing a vehicle
- Q&A with EV experts
- Compare various EV models
- \$50 VISA gift card for test driving an EV





EV Virtual Ride & Drive Video Series



<http://ouc.com/EV>



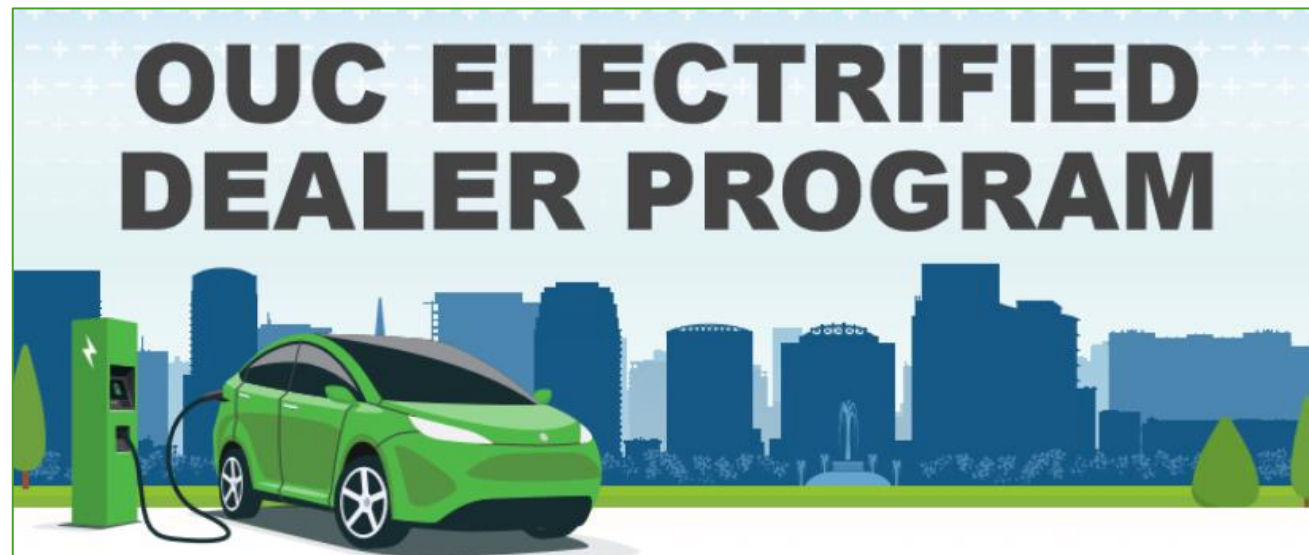
Electrified Dealership Program

Launch: November 2020

Progress:

- 5 dealerships participating with a goal of 15 participating in 2021
- Diversity in branding. Nissan, Jaguar, Volvo, Audi confirmed
- 10+ of 30 sales reps trained
- Chevrolet (3), Ford and Mini all introduced to the program

Next steps: Continue to build dealership pipeline. Continue to train more salespeople.



OUC ELECTRIFIED DEALER PROGRAM

Orlando Utilities Commission (OUC – The *Reliable One*) has introduced a new Electrified Dealer Program designed to enhance the electric vehicle (EV) purchasing experience and help increase and encourage EV purchasing/leasing in Central Florida. Through this program, local dealers can take advantage of financial incentives for each eligible electric vehicle sold or leased along with specialized EV training and educational materials.

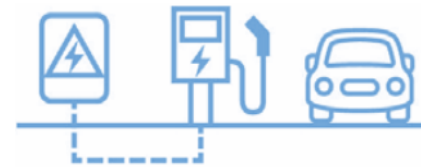
BENEFITS	REQUIREMENTS
<ul style="list-style-type: none"> • Direct-to-dealer sales incentives • Recognition on OUC's website • Promotional media kit • Lead generation from OUC Ride and Drive programming • Marketing collateral for on-site use • EV sales training to staff • Co-marketing opportunities 	<ol style="list-style-type: none"> 1. EV/PHEVs and ICE in inventory on lot 2. Actively sell and advertise EV/PHEVs 3. Share monthly EV/PHEV sales data with OUC 4. Two sales staff members must train with OUC twice a year 5. Functioning EV charging station on site at the dealership and available to customers 6. Participate with OUC in cross-promotion marketing

Orlando EV Readiness Code

- Approved by Orlando City Council on August 23, 2021
 - Sunrises January 1st, 2022
- An EV readiness ordinance requires a percentage of new parking spaces built to include electrical infrastructure that enables future EV charging.
- Covered types can include:
 - Commercial
 - 2% installed; 10% capable
 - Multi-family
 - 2% installed, 20% capable



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



EVSE Installed: Install a minimum number of Level 2 EV charging stations.



Background

As part of our Green Works Orlando goals, we have been investing in programs to reduce our use of fossil fuels and accelerate the adoption of low/no emission vehicles, such as **electric vehicles**. Over the years, the City and OUC have worked to provide consumer rebates, installing public EV charging infrastructure, hosting Ride & Drive events, transitioning LYNX electric bus fleet, streamlining the permitting process for EV charging infrastructure, and more.

Through the passage of this **EV Readiness code**, the future developments of commercial buildings 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.

The Automaker Alliance calls on governments to prepare for rapid transition to zero-emission vehicles over then 10-15 years



March 29, 2021

President Joseph R. Biden, Jr.
The White House
1600 Pennsylvania Avenue
Washington, DC 20500

Dear President Biden:

We write today on behalf of a diverse group of motor vehicle manufacturers, suppliers, and hundreds of thousands of United Auto Workers members and retirees, who are committed to working toward a net-zero carbon transportation future that includes a shift to electric-drive vehicles. This shared vision has brought the auto industry in the United States to a transformative moment, one that will shape a cleaner future and redefine motor vehicle transportation for generations to come.

For the U.S. to be a leader in this transformation, we must work collaboratively to develop a comprehensive national vision and strategy. This is not just about the future of the auto industry in the U.S., it is about the nation's global competitiveness, economic security, and the transition of the U.S. workforce. Nations that lead the development and adoption of innovative technologies will also shape supply chains and job creation, define global standards and, potentially, reshape the international marketplace. However, neither the current trajectory of consumer adoption of EVs, nor existing levels of federal support for supply- and demand-side policies, is sufficient to meet our goal of a net-zero carbon transportation future.

We stand ready to work with your Administration to define the bold, comprehensive vision and innovation that will place the U.S. at the forefront of creating a cleaner future for motor vehicle transportation. This transformation is greater than any one policy, branch or level of government, or industry sector. It will require a sustained holistic approach with a broad range of legislative and regulatory policies rooted in economic, social, environmental, and cultural realities. Such an approach will complement and amplify significant private sector resources that will accelerate a net-zero carbon transportation future. If we work without a comprehensive plan, our nation will fall short of this goal.

Automakers and suppliers will invest \$250 billion in electrification by 2023, including Plug-in Hybrid Vehicles (PHEV), Battery Electric Vehicles (BEV) and Fuel Cell Electric Vehicles (FCEV) (collectively, "EVs"). IHS Markit predicts there will be 130 EV models available in the U.S. by 2026. Even with the collective efforts of the public and private sectors, of the 278 million light-duty vehicles currently registered in the U.S., only 1.5 million are EVs. And despite growing consumer interest and more than 50 EV models available, EVs only made up about two percent or roughly 300,000 of the 14.5 million new vehicle sales last year. This is why we need a comprehensive plan that takes the present market realities into consideration, as well as the on-going investment and innovation in internal combustion engine (ICE) technologies.

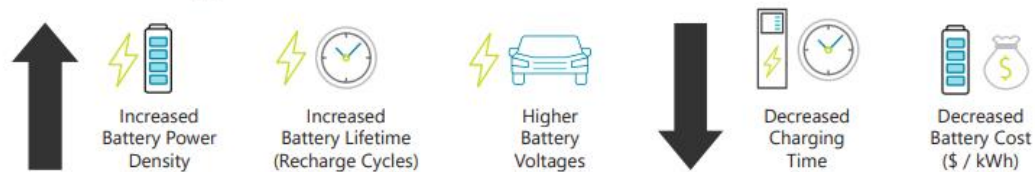
"...Currently, the majority of EV charging takes place at home, and that is likely to continue into the future. Charging at home can be inexpensive, convenient, and reliable. Extending these benefits to all EV owners will require new and targeted efforts. **Installing charging is a straightforward prospect for those who own their own homes and have dedicated off-street parking in a garage or driveway, but policymakers will need to carefully consider the tens of millions of Americans who rent or live in multi-unit dwellings (MUDs).** While public DC fast charging stations or other public chargers could meet some needs, the convenience of refueling at home is a key advantage of EVs, and it would be unreasonable and unequitable to expect renters and MUD residents to pay more and spend time away from home each week to charge publicly.

"Numerous studies show that the cost to retrofit a home or business with EV charging equipment is several times more expensive than installing it during new construction, so designing EV-ready building codes must be part of the answer. Supporting charger installation at apartment complexes or renter-occupied housing that already exists will be necessary, too. Public policies will need to account for this and find ways to support installation of charging options that serve all drivers."

Money Talks: EV are quickly becoming the most cost-effective vehicle

Upfront cost is a major deciding factor for consumers, a factor that will favor EVs soon.

EV Technology Trends



BEVs HISTORICAL BATTERY COST & RANGE

2010 COST
 ~\$1,175 per kWh
 2015 COST
 ~\$375 per kWh

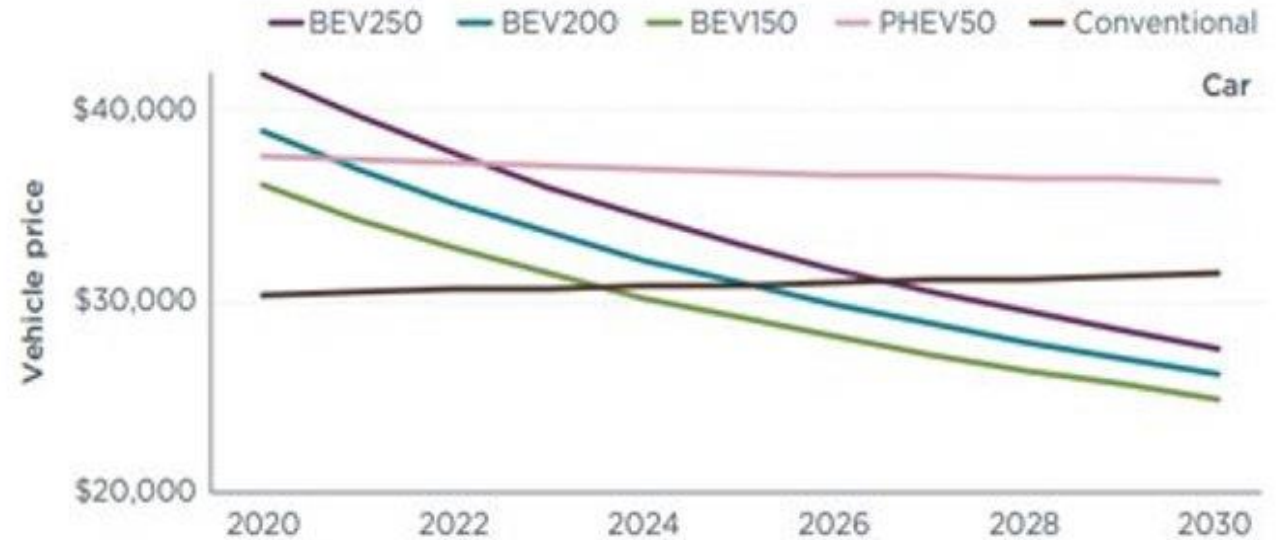
2010 RANGE
 ~75 miles
 2015 RANGE
 ~160 miles

BEVs FORECASTED BATTERY COST & RANGE

2020 COST
 ~\$160 per kWh
 2025 COST
 ~\$100 per kWh

2020 RANGE
 ~250 miles
 2025 RANGE
 ~450 miles

* Targeted cost to be competitive with traditional gasoline vehicles



Additionally.... "By 2029, EVs will reach upfront price parity with the average vehicle purchased by a low-income household, less than two years after the average vehicle purchased by a high-income household." (source: [ICCT](#))

United States of America goes 'All-in' on Electric Vehicles



President Biden announced a commitment to transition Federal government fleet (645,000+) to EV by 2030.

550,000+ EV charging stations across America.

Reinstate the federal investment tax credit for EVs

Incentives for manufactures to re-tool and re-train workforce

Florida State Legislature endorses and encourages Electric Vehicles

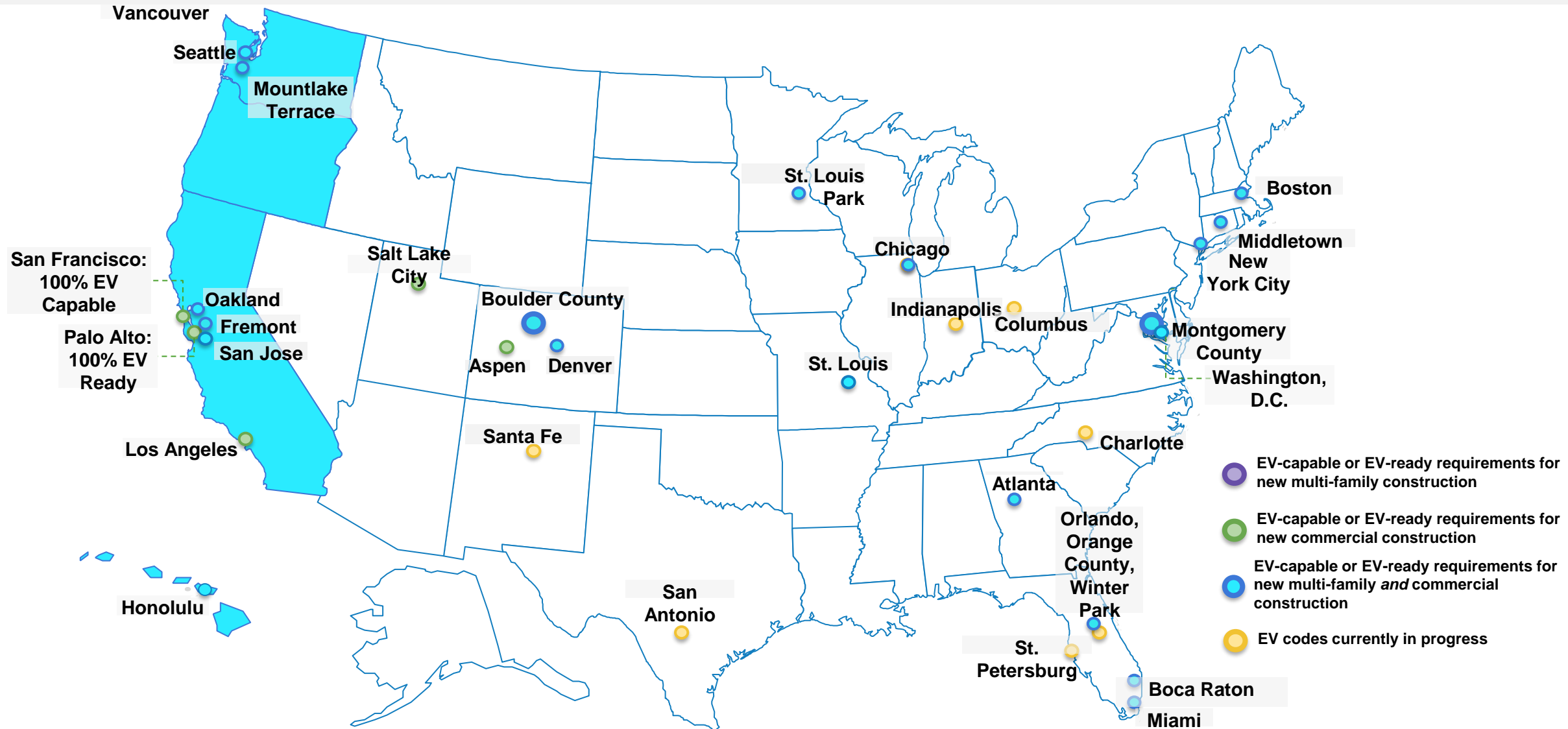
Electric vehicles are an important emerging technology for Orlando residents, as recognized by the Legislature of the State of Florida:

“...conserves and protects the state’s environmental resources, provides significant economic savings to drivers, and serves an important public interest.” F.S.S. 718.113(8)

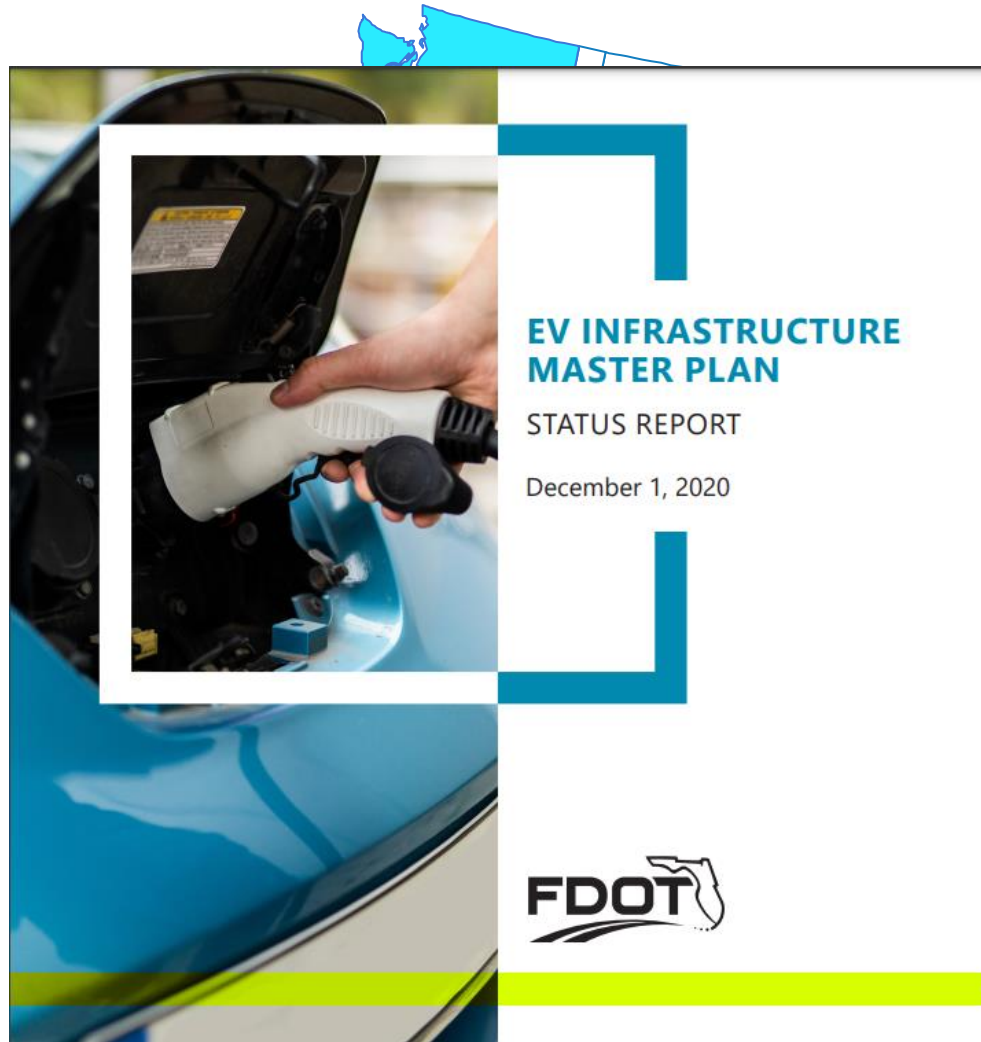
In 2018, Florida passed *'Right to Charge'* law for Condo and apartment Owners



Best Practice in zoning codes nationwide



Best Practice in Florida – Alignment with FDOT



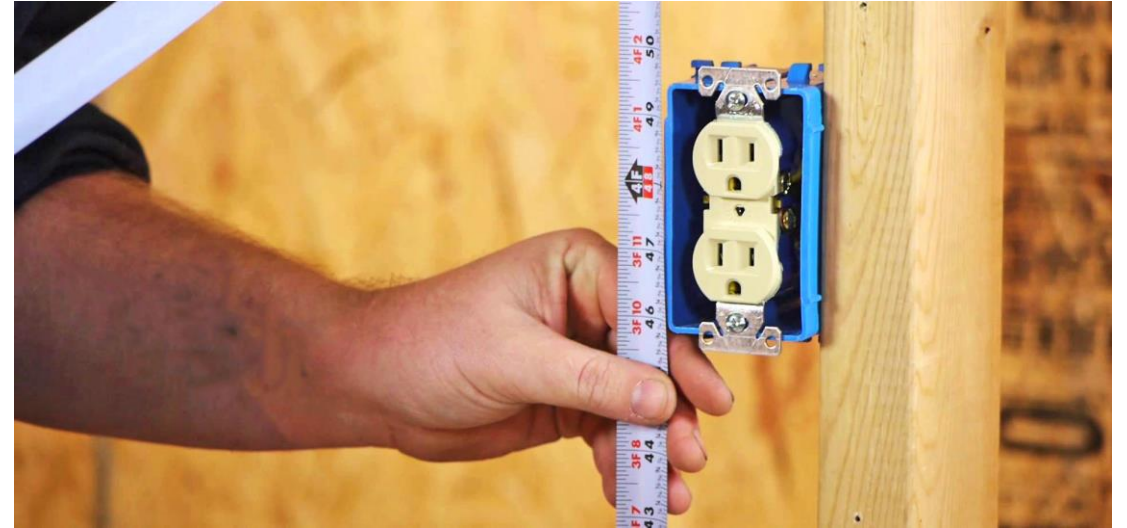
**Florida Department of Transportation
Electric Vehicle Master Plan (EVMP) identifies EV
readiness as a key strategy:**

*5. "Provide Guidance and Best Practices to Local Jurisdictions
and Agencies: Develop model building and zoning codes to
incorporate EVSE"*



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 residents to “trickle charge” their vehicles
- **This code does not cover multi-family or commercial construction (Equity issue)**



Overview of EV Readiness stakeholder engagement

- 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)
- 05/04/21 City met with Southern Alliance For Clean Energy, Moms for Clean Air Force, EV Transports,
- 05/12/21 Public Roundtable webinar
- 05/18/21 City met with NAACP
- 06/15/21 Municipal Planning Board – vote passed to approve EV Readiness



Purpose of EV Ready Code – Meets existing demand and future proofs parking spaces for EV adoption



EVSE Installed: Electric Vehicle Supply Equipment (EVSE) is a charging station that powers EVs.

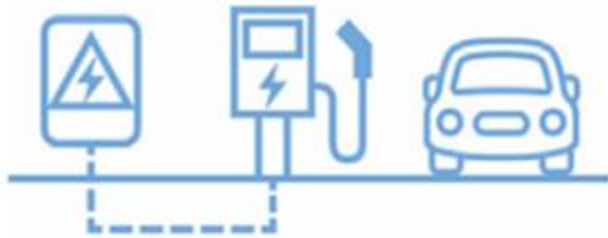
2% *new* vehicle registrations are EVs in Florida, matching the proposed 2% requirement of new parking dedicated for EVSE



EV Capable: EV adoption will increase drastically over the next decade.

20% EV Capable prepares new parking with basic elements that avoid *cost prohibitive* future retrofits at *minimal costs*.

Two tiers of Orlando EV Readiness Code



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



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



Significant concessions have been made to the proposal...

<u>Type</u>	<u>EV Ready</u> 40 amps per space	<u>EVSE Installed</u>
Single Family, Duplex, Townhouse	1 space	
Certified Affordable Multi-family Housing	20%	?%
Multifamily, Hotel, all parking structures	20%	2% (requirement begins at 50 spaces)
Non-residential (offices, retail, public, recreational and institutional uses)	20%	2% (requirement begins at 250 spaces)
Industrial (employee parking only)	10%	2% (threshold begins at 250 spaces)

- Applies to:
- New projects
 - Substantial improvements
 - Substantial enlargements

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Revisions following stakeholder engagements:
 1) ~~Single-family requirement:~~
eliminated

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Revisions following stakeholder engagements:
 1) *Single-family requirement: eliminated*
 2) *EV Ready: wiring eliminated (downgrade to EV Capable)*

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Revisions following stakeholder engagements:

- 1) Single-family requirement: *eliminated*
- 2) EV Ready: *wiring eliminated (downgrade to EV Capable)*
- 3) Commercial (non-res) decreased from 20% to 10% EV Capable

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- 2) EV Ready: *wiring eliminated (downgrade to EV Capable)*
- 3) Commercial (non-res) decreased from 20% to 10% EV Capable
- 4) Certified Affordable – 0% EVSE installed

Significant concessions have been made to the proposal...

<u>Type</u>	<u>EV Capable</u> 40 amps per two space	<u>EV Ready</u> 40 amps per space	<u>EVSE Installed</u>
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- 4) Certified Affordable – set at 0% EVSE installed
- 5) Panel capacity reduced 50% from 40 amps per space to every two spaces

Significant concessions have been made to the proposal...

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Applies to:

- New projects
- ~~Substantial improvements~~
- Substantial enlargements:
Applies to *new* parking only

Revisions following stakeholder engagements:

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- 5) Panel capacity reduced 50% from 40 amps per space to every two spaces

What is not required to comply?

- **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 are included in parking minimum requirements.
- **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)

Avoiding 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 for EV-Ready (not EV Capable) in one study of new construction multi-family and commercial projects

	New Construction	Stand-Alone Retrofit
Small Office/ Retail Surface Parking	\$905	\$5,540
Medium Office/ School Surface Parking	\$901	\$4,155
Large Office/ Retail/ Hospital Enclosed Parking	\$739	\$2,779

Figure 5. Estimated Cost of Installing EV Capable Parking per EV Capable Parking Space. Refer to Table 7 in the report for a more detailed breakdown of the costs by type of expense.

Avoiding costs – and barriers to access and affordability

The rise of EV charging deserts

When looking at cities such as New York, Los Angeles, Chicago and Oakland, California, you begin to see a trend of certain neighborhoods that have been prioritized over others.

For example, in the Bronx, which has a population of 1.4 million with a median household income of just \$40,000, there are only 17 EV charging stations.

That oversight has real implications for community health. The Bronx is also home to "Asthma Alley," a portion of the borough that adopted the name because asthma hospitalizations are five times the national average and at rates 21 times higher than other neighborhoods in New York City due to their proximity to four major highways.

Why equity must be central to EV infrastructure planning

By [Jonathan Gomez](#)

May 25, 2021



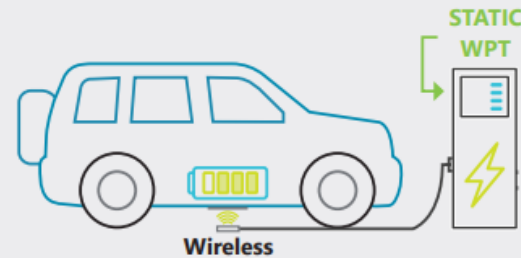
An EV charging port in New York City. Courtesy of [nyc.gov](#).

Courtesy of

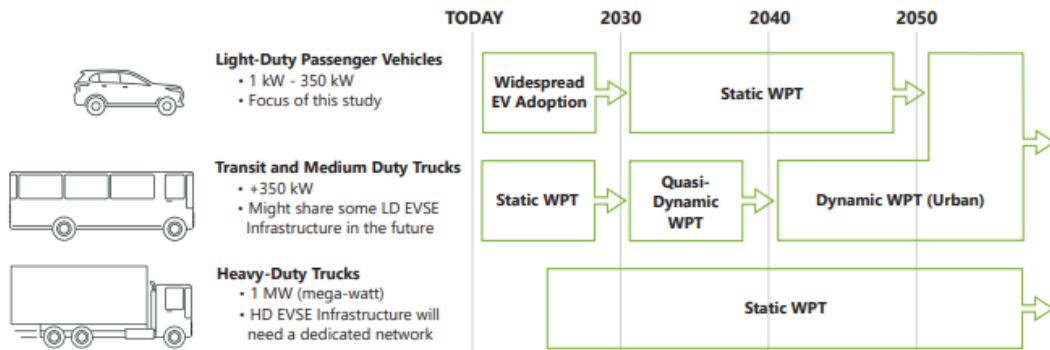
Future charging technology is electric and aligns with this code.

Future EVSE Technologies for Fleet & Passenger Operations

- ✓ Higher power charging, up to 350 kW with current standards
- ✓ Extreme Fast Charging (XFC), 1 MW+ for medium / heavy duty
- ✓ Wireless Power Transfer (WPT)



WPT (Wireless Power Transfer) is Coming



Florida EV Master Plan:

- Static wireless power transfer (WPT) to dominate light duty vehicles from 2030-2050

*EV Capable requirements are compatible with WPT.

Source: Florida Department of Transportation EV Master Plan (December 2020)

Current EV Incentives available for Developers

Alternative Fuel Vehicle Refueling Property Credit: provided by the IRS (Form 8911) for investments in alt. fuel dispensers, including EV charging stations, providing the maximum credit per location is the lesser of \$30,000 or 30 percent of the cost.

Orlando Green building Incentive Program: the program provides property tax rebates for all commercial and multi-family development that achieves LEED Silver, Gold, Platinum, or above certification. This includes meeting the requirements in the LEED certification, which align directly with the EV Readiness Code that we are proposing. The incentive provides up to 100% of the first-year property taxes as a rebate based on the level of LEED certification achieved.

Commercial PACE Financing: the program enabled eligible PACE lenders to operate in Orlando, helping to cover 100% of qualified eligible improvements to new or existing buildings, and repayment mechanism is on the property tax payments over flexible terms. EV charging infrastructure is an eligible improvement.

OUC Charge-It/Own-It: a turn-key program created to offset 100% of the upfront cost of installing EV charging stations from the engineering, design, development, and finance on the utility bills over a 5-year term -- both new construction and existing buildings.

OUC Own-IT / Charge-It program

CHARGING STATION OPTIONS

CHARGE-IT

OUC Owns, Installs & Maintains Stations

You can obtain electric vehicle charging services from OUC for a fixed monthly fee over a contracted period of time. The fee is based on specific characteristics of your site and the equipment type.

OWN-IT

OUC Designs, Procures & Installs Stations

You pay for the equipment and installation that OUC provides, then you own it immediately.



TYPES OF CHARGERS

CHARGING OPTION	POWER REQUIRED	CHARGING TIME*
Level 2	208 or 240-volt	3.5 hours
Level 3	480-volt	30+ minutes

*Charging time will vary depending on battery type and vehicle.

How can a Charging Station benefit your business?



Allows you to offer electric vehicle charging to your customers, employees and fleet.



Increases customer traffic while customers wait for their vehicle to charge.



Provides you with a service to power up your own electric vehicle fleet.



Helps reduce carbon emissions.



Model: CT-4021, Dual Pedestal



EV Readiness Code Policy Overview

Chris Castro
Director, Office of Sustainability & Resilience
City of Orlando, FL

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 breaker 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"

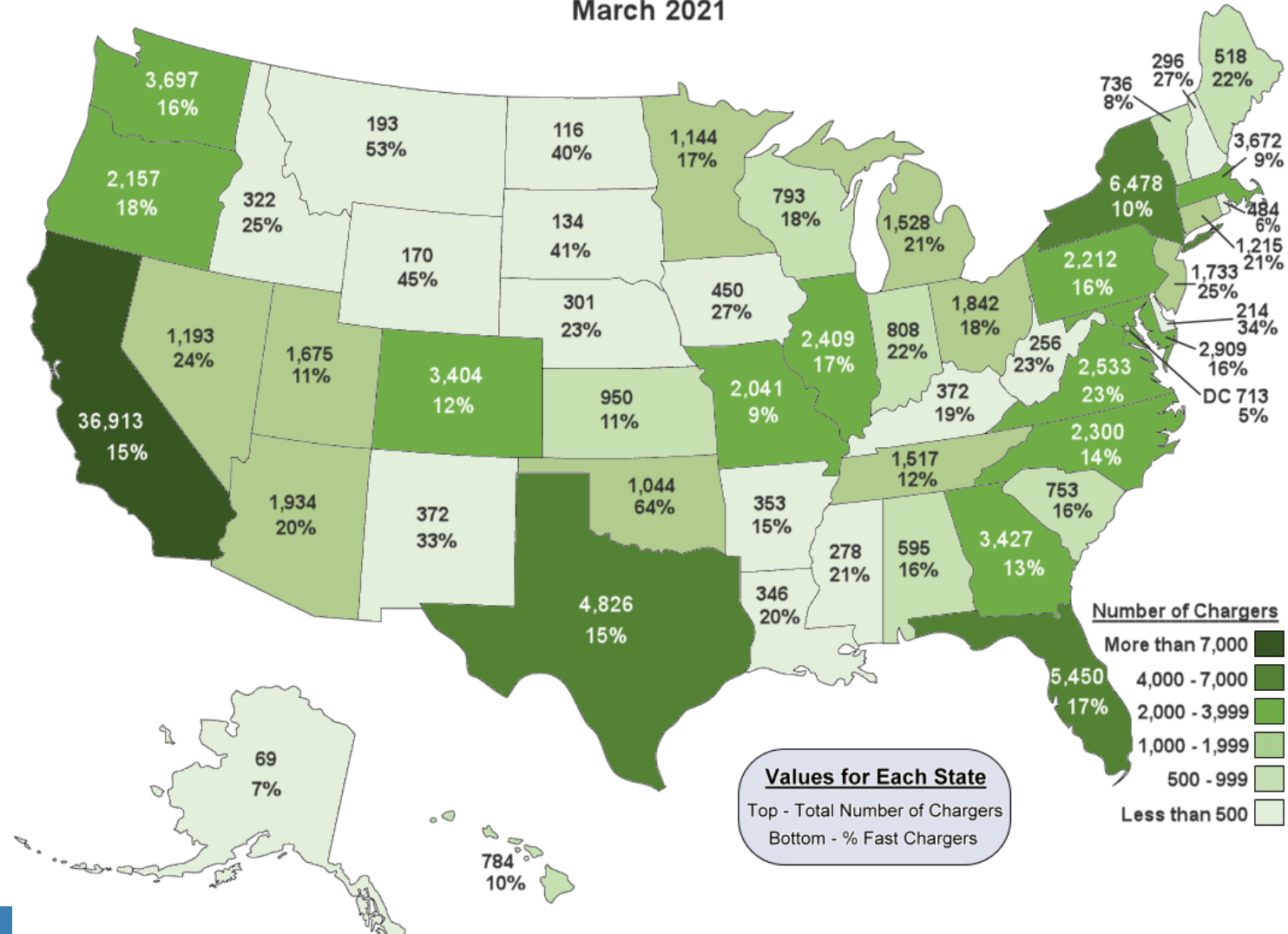
State Highway System EVSE masterplan due by July 1, 2021; City installing 100 public stations 2021; OUC installing DC Fast charging hub downtown

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

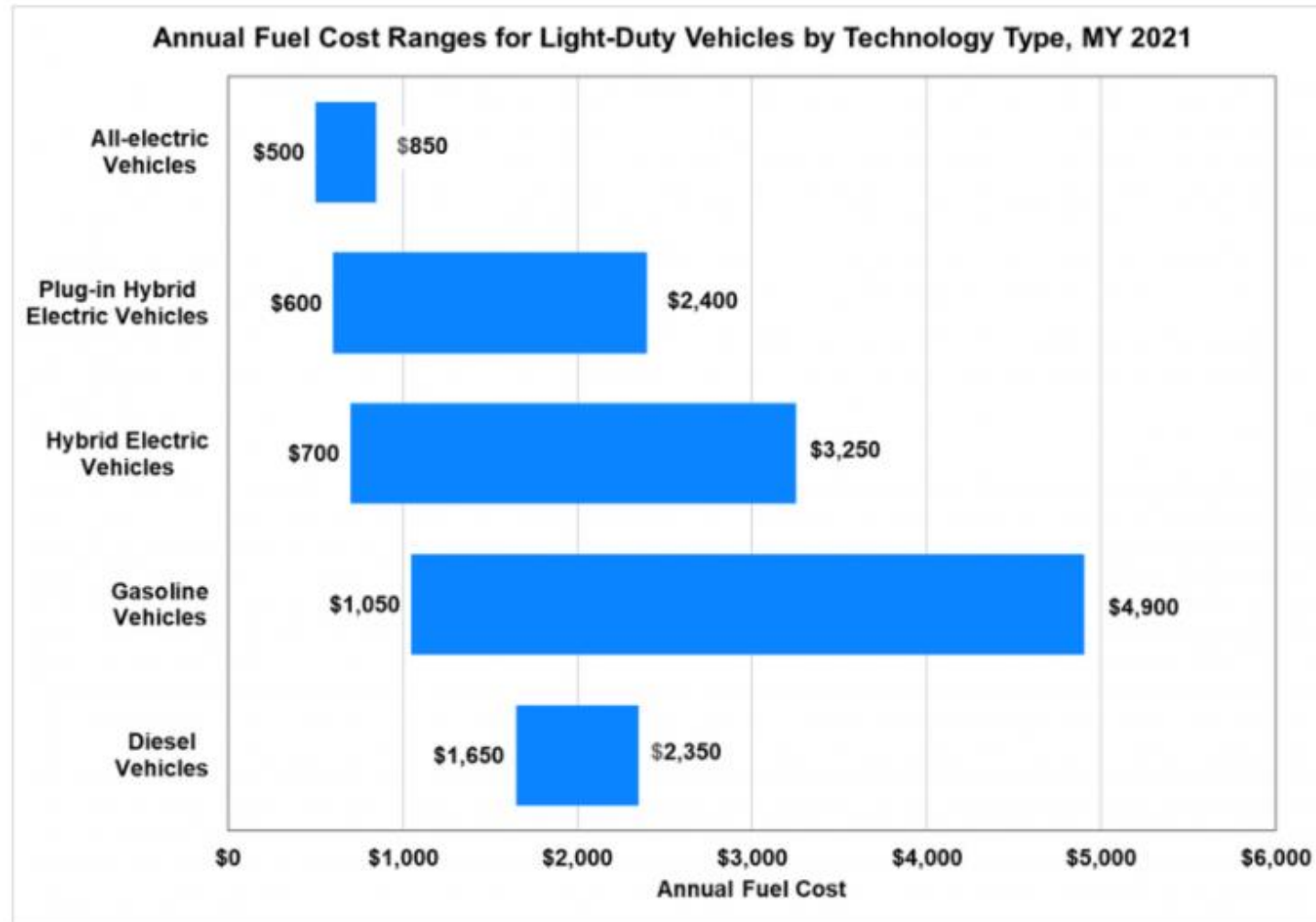
	<u>Atlanta, GA (2018)</u>	<u>Miami-Dade County, FL (2019)</u>	<u>Boca Raton, FL (2017), Miami Beach, FL (2016)</u>	<u>Coral Gables, FL (2018)</u>	<u>Orlando (proposal)</u>
Single Family	EV capable	N/A	N/A	N/A	N/A (Already required in FBC)
Multi-family and Commercial	20% EV capable	10% EV-Ready (<2022) 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

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...



NEXT STEPS



NEXT STEPS

- Clark County Model Ordinance
 - Survey
 - Cost Analysis
- Next Meeting: July 7
 - Survey and cost analysis results



APPENDIX



May Meeting: EV CHARGING MODEL ORDINANCE

April Bolduc
S Curve Strategies

MODEL ORDINANCE DISCUSSION

- At March TEWG meeting, all were invited to participate in meeting to provide input to EV charging model ordinance discussion
- Attendees:
 - City of Henderson
 - City of Las Vegas
 - Howard Hughes/Southern NV Home Builders Association
 - NV Resort Association
- Also provided input:
 - SWEEP
 - Tesla



Source: Las Vegas Review-Journal

DISCUSSION TOPICS

- Why an EV charging ordinance?
- Consider equity
- Ordinance options
- Current ordinances
 - Request case study presentations
- Concerns and possible solutions
- Feedback and next steps



WHY AN ORDINANCE?

1. To grow EV adoption we need EV charging
2. EV drivers want to charge at home, work, and where they visit
 - If an EV driver hasn't asked you yet where to charge...they soon will
 - Most want to charge at home
3. Retrofits are expensive
 - Denver EV charging building code proposal found savings in avoided retrofit costs
4. State goals of net zero
 - Meet need of Clark County EV growth projections
5. Automakers are transitioning to electric
 - Local dealers already preparing for their lots to be a majority electric
6. Equity is critical
 - Low-income households have longer commutes and need reliable charging

EV Infrastructure Requirement	During New Construction	During Retrofit	Savings
EV-Capable (panel capacity + raceway)	\$300 per space	\$2,500 per space	\$2,200 per space
EV-Ready (full circuit)	\$1,300 per space	\$6,300 per space	\$5,000 per space

Source: Denver EV charging building code proposal

EQUITY

- Single-family homes – most have access to 120-volt charging
 - Most don't have 240-volt access
- Multi-family communities – most no access to charging
 - Expensive to retrofit
 - Challenge to share charging among drivers overnight
- Low-income families
 - Longer commutes – 50-minute roundtrip average for Clark County*
 - Less expensive EVs with shorter ranges
 - Level 2 = 25+ miles per hour of charge**
 - Level 1 = 4 miles per hour of charge

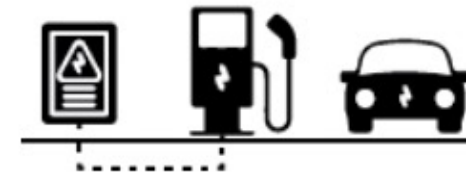
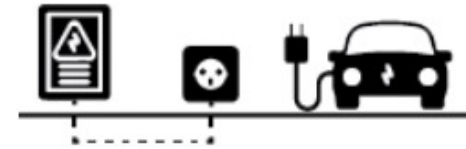
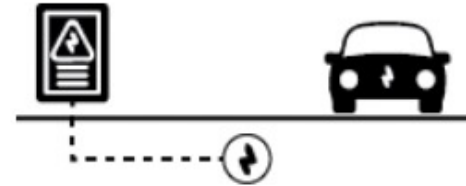


*Source: US Census Bureau: <https://www.census.gov/quickfacts/clarkcountynevada>

**Charging miles depend on charging equipment and car capability.

INFRASTRUCTURE OPTIONS

- EV Capable Parking Space
 - Electrical panel capacity and conduit, no wires
 - Provide hard-to-retrofit elements during new construction while minimizing up-front cost.
- EV Ready Parking Space
 - EV Capable + 240-volt outlet
 - Full circuits are plug ready and minimize total costs and additional barriers to installing charging.
- EV Charging Installed
 - All + charging station installed
 - Provide a visible signal that building supports EV charging and reduce future EV charger installation costs to zero.
- Existing Building Alterations
 - With 50-year lifespan for typical building, could be retrofitted during significant remodel



7 STATEWIDE ORDINANCES IN 2021

- CA – Building standards (<https://afdc.energy.gov/laws/11068>)
- OR – Building standards for new construction (<https://afdc.energy.gov/laws/11941>)
- MD – Charging policies for associations (<https://afdc.energy.gov/laws/12624>)
- NJ – 4 types
 - Charging make-ready requirements for multifamily communities (<https://afdc.energy.gov/laws/12680>)
 - Charging make-ready requirements for new developments (<https://afdc.energy.gov/laws/12679>)
 - Charging policies for condominiums (<https://afdc.energy.gov/laws/12569>)
 - Residential charging policies (<https://afdc.energy.gov/laws/12570>)
- In 2015, WA adopted EV charging building standards for new construction (<https://app.leg.wa.gov/rcw/default.aspx?cite=19.27.540>)

SINCE 2015, 30+ CITY ORDINANCES

- AZ – Flagstaff, Sedona
 - Scottsdale and Tempe in progress
- CA – Oakland, Palo Alto, San Francisco, San Jose
 - Reach codes above state requirements
- CO – 16 cities + 1 in progress
- FL – Orlando (began Jan. 2022)
- GA – Atlanta
- HI – Honolulu
- IL – Chicago
- MO – St. Louis
- UT – Salt Lake City (in progress)
- WA – Seattle
- Washington DC
- WI – Madison

City of Orlando will present at our May Working Group meeting.

CITY ORDINANCE EXAMPLES

Municipality	State	Year	Location	Single-family	Multi-family	Commercial
<u>Atlanta</u>	GA	2017	Code of Ordinances	1 EV-Capable space per dwelling unit	20% EV-Capable	
<u>Chicago</u>	IL	2020	Ordinance	-	20% EV-Ready (5+ spaces)	20% EV-Ready (30+ spaces)
<u>Denver</u>	CO	2020	IBC / IRC	1 EV-Ready space per dwelling unit	5% EV-Installed, 15% EV-Ready, 80% EV-Capable	5% EV-Installed, 10% EV-Ready, 10% EV-Capable
<u>Dillon</u>	CO	2020	IBC / IRC	1 EV-Ready space per dwelling unit	5% EV-Installed, 10% EV-Ready, 40% EV-Capable (10+ spaces)	5% EV-Installed, 10% EV-Ready, 40% EV-Capable (25+ spaces)
<u>Flagstaff</u>	AZ	2019	IBC / IRC	1 EV-Ready space per dwelling unit	3% EV-Ready	3% EV-Ready
<u>Madison</u>	WI	2021	Ordinance	-	2% EV-Installed, 10% EV-Ready (increases by 10% every 5 years)	1% EV-Installed (increases by 1% every 5 years), 10% EV-Ready (increases by 10% every 5 years)
<u>Seattle</u>	WA	2019	Ordinance	1 EV-Ready space per dwelling unit	100% EV-Ready up to 6 space, 20% for parking lots with 7+ spaces	10% EV-Ready
<u>St. Louis</u>	MO	2021	Ordinance	1 EV-Ready space per dwelling unit	2% EV-Installed, 5% EV-Ready (increases to 10% in 2025)	2% EV-Installed, 5% EV-Ready
<u>Summit County</u>	CO	2020	IBC / IRC	1 EV-Ready space per dwelling unit	5% EV-Installed, 10% EV-Ready, 40% EV-Capable (10+ spaces)	5% EV-Installed, 10% EV-Ready, 40% EV-Capable (25+ spaces)
<u>Washington DC</u>	DC	2021	Legislation	-	20% EV-Ready (3+ spaces)	20% EV-Ready (3+ spaces)

MODEL ORDINANCE CONCERNS & POSSIBLE SOLUTIONS

April Bolduc
S Curve Strategies

COST CONCERNS

- Costs to developers of new construction
- Costs to existing building owners to retrofit when permit pulled for remodel
 - This is by far was the largest concern of builders or property owners
- Overall costs of utility upgrades and line extensions
- Some segments already adding charging based on guest need
- \$100M in SB 448 incentive funding may not be enough



EV charging station installation.

POSSIBLE COST SOLUTIONS

- Look to case study best practices of like regions
- Consider phased approach
 - First residential, then later commercial
 - First 10% of parking, with higher percentage in future
 - Tie phases to demand and need
- Develop cost analysis based on real-world, local projects
- Consider in cost analysis
 - Can costs be monetized for least impact?
 - Residential (own vs. lease) and commercial
 - New build and retrofits
 - 10% EV-ready parking vs. 30%
 - Few DC fast chargers vs. numerous Level 2
 - Include materials supplies, labor, overhead vs. status quo
 - Request NV Energy run side-by-side cost analysis to benefit in current electrification analysis effort



City of Orlando code went into effect Jan. 2022 and will present at May 5 meeting.

OTHER POSSIBLE SOLUTIONS

- Governments should align model ordinance efforts as best they can
 - Target zoning code and add to it vs. change it
 - Zoning code first then building code to follow
- Parking
 - Ensure developers/owners are not penalized for reduced parking and can move forward without a waiver request
 - Parking layout to drivers is not quantity, its quality – ensure better job done of parking layouts
 - Charging equipment tends to be installed closest to the power source to minimize costs
 - EV drivers may be OK parking farther if access to charging
 - Review ADA parking requirements and create calculation on standard parking requirements



OTHER POSSIBLE SOLUTIONS

- Better understand NV Energy's
 - TE program approval requirements
 - include makes, models, inspections
 - Timing of changing Rule 9 (line extension rules)
 - If first two properties on block take up all capacity is the next responsible for the substation upgrade?
 - Sept. 1 filing
 - Impacts to energy costs for commercial
 - Capacity problem with increased energy demand
- Equity for rural communities
 - Similar costs to build for Level 1 vs. Level 2
 - Level 2 is preferred for those with longer commutes



OTHER POSSIBLE SOLUTIONS

- Present parking layout examples
 - Unclear how parking lots are impacted by those ordinances requiring 30%+ make-ready
 - Concern is less parking spaces will be available after adding EV charging (particularly with ADA requirements)
 - Ordinance case studies are unclear on if retail charging parking spots were lost

