District of Columbia

Transportation Electrification Roadmap

Introduction to Mobility Equity

Webinar will begin shortly…

DEPARTMENT OF ENERGY & ENVIRONMENT

GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

District of Columbia

Transportation Electrification Roadmap

Introduction to Mobility Equity

Wednesday, 17 March 2021

DEPARTMENT OF ENERGY & ENVIRONMENT

GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

Welcome – Opening Remarks - Agenda

Agenda Outline

- Background: *DOEE's Transportation Electrification Roadmap*
- Introduction to the Grantee: *the Electrification Coalition*
- Transportation Electrification Roadmap: Recapping January Orientation
  - Activities/Tasks
- Campaign Resources:
  - Electric Vehicles
  - Charging Infrastructure
- Introduction to Mobility Equity
  - EV Adoption Strategies
- Questions/Discussion

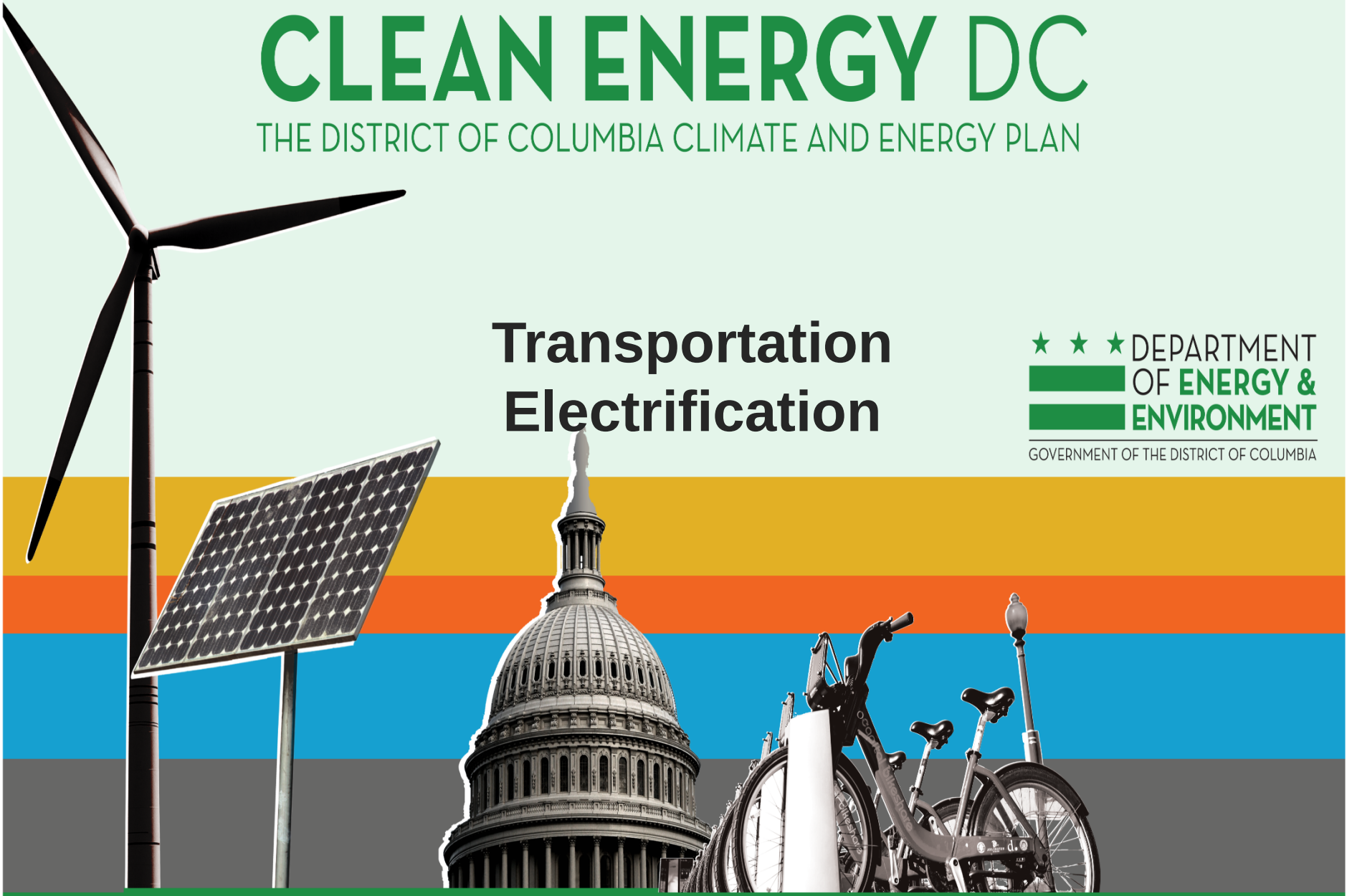
CLEAN ENERGY DC

THE DISTRICT OF COLUMBIA CLIMATE AND ENERGY PLAN

Transportation Electrification

DEPARTMENT OF ENERGY & ENVIRONMENT

GOVERNMENT OF THE DISTRICT OF COLUMBIA

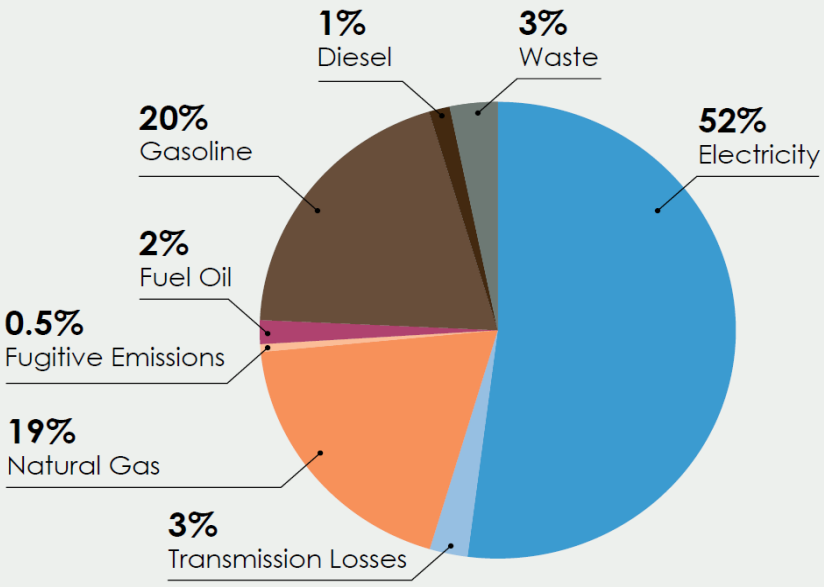


@DOEE_DC

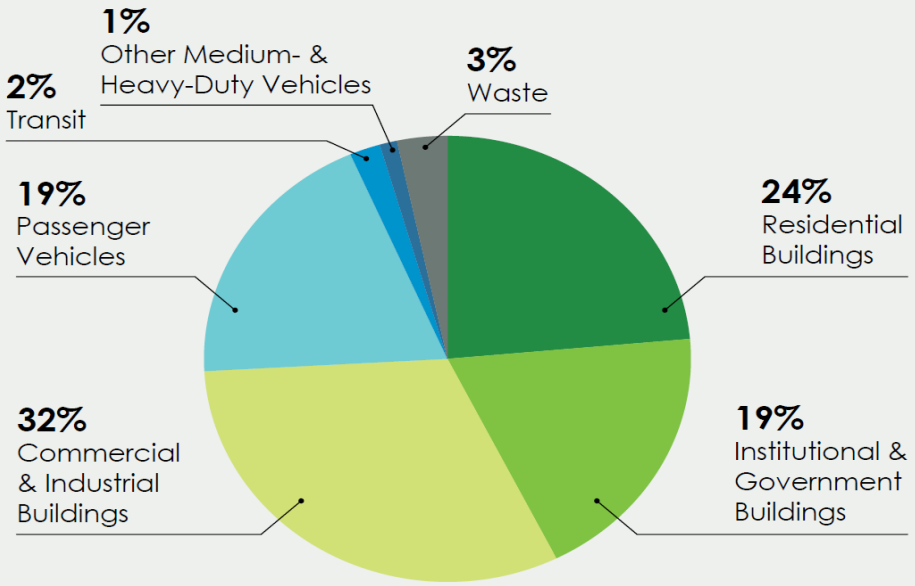
DC CLIMATE AND ENERGY GOALS

Clean Energy DC is the District's first quantified roadmap to meet the Sustainable DC climate and energy goals.

GHG EMISSIONS BY SOURCE



GHG EMISSIONS BY SECTOR

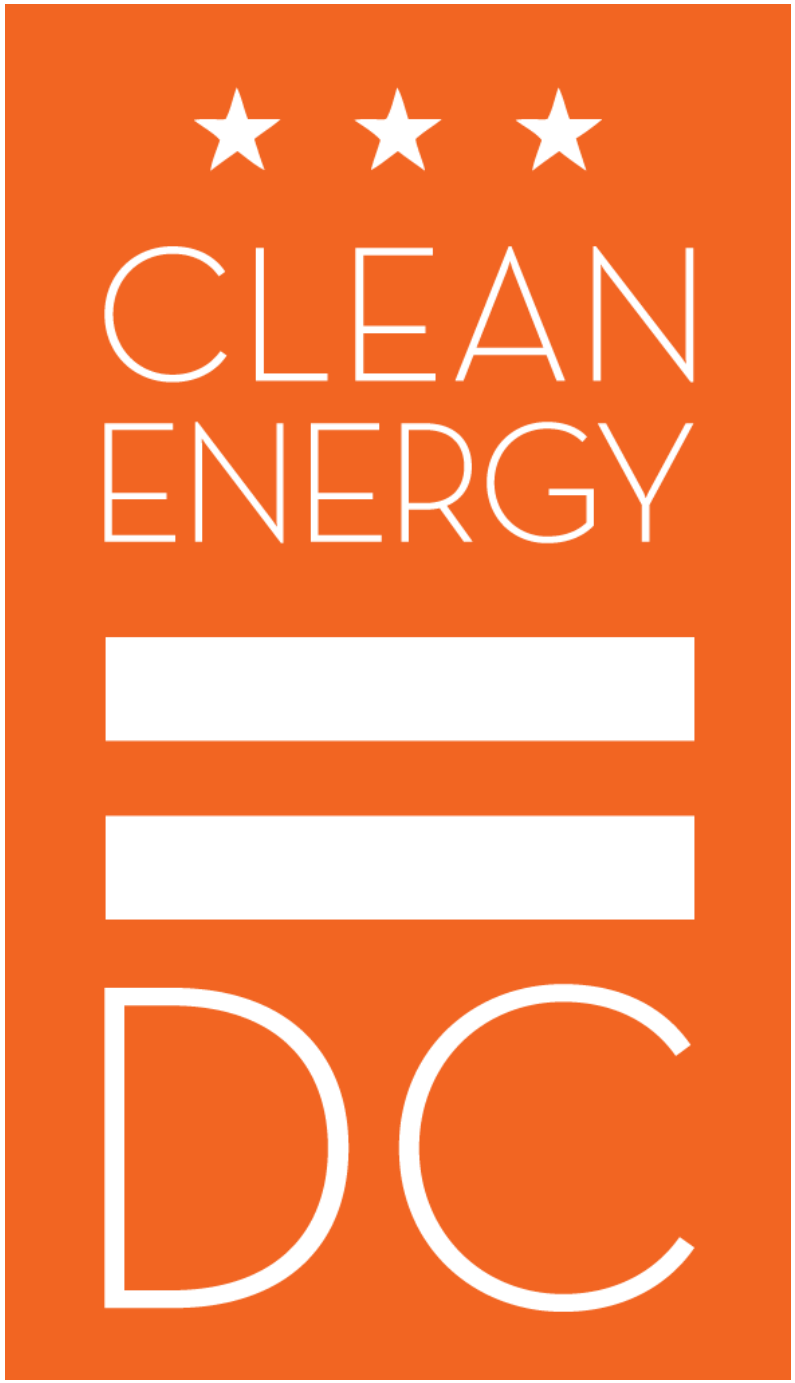


The plan will **reduce emissions by 50 %** by 2032 compared to 2006 levels, and will help the city achieve **carbon neutrality by 2050**

Overview of CEDC Act

The Act, effective as of March 2019, will realize CEDC goals by targeting three areas:

- **Transportation Emissions Reduction and Electrification-** mandates and incentivizes a path for zero-emissions fleets, buses and private vehicles
- **Renewable Energy-** mandates 100% renewable energy by 2032
- **Energy Efficiency-** Establishes a first-of-its kind Building Energy Performance Standard for buildings



TE Roadmap Goals

1. Buses and private fleets 50% Low or ZEV by 2030 → 100% ZEV by 2045

2. 100% EV replacement of public buses and school buses at EOL by 2021

3. At least 25% ZEV registrations by 2030 (estimates~75,000 EVs)

Provide policies, cost estimates, and timelines

Roadmap – Status

- Compared TE Roadmaps to determine best approach for DC
    - Looked at *Pittsburgh, San Francisco, Fort Collins, Boston* (proposal), *Austin, NY, Columbus*
- Awarded Grant to the Electrification Coalition
- Currently on track to present plan to the Mayor's office beginning of next fiscal year.
- Convening a stakeholder engagement group to provide feedback

CONTACT INFORMATION

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The Electrification Coalition

Who We Are

The Electrification Coalition (EC) is a nonpartisan, non-profit organization committed to promoting policies and actions that facilitate the deployment of electric vehicles on a mass scale, in order to combat economic and national security dangers caused by our dependence on oil.

- Technical Lead: **Climate Mayors EV Purchasing Collaborative**
- Electrification Advisor: B**loomberg American Climate Cities Challenge**
- Freight Electrification Pilot Project: **Hewlett Foundation**
- Lead Electrification Partner: **Smart Columbus**
- Electrification Advisor: **City of Atlanta Partnership**
- Project Lead: **Drive Electric Northern Colorado**
- Project Lead: **Rochester EV Accelerator**

Transportation Electrification Roadmap

January 27 Orientation recap:

- *View our previous **webinar recording**: (shared in chat and after this webinar)*
- Outline of Roadmap workstreams in relation to goals; overview of work completed, work that remains, and how it will be achieved.
- Transportation Electrification Roadmap Final Report due **October 31, 2021**
  - ***Receive Stakeholder comments and redraft accordingly***

Transportation Electrification Roadmap

- Strategies for increasing private sector investment in EVs and related infrastructure:
- Determine infrastructure needs and prioritize equitable placement within the District

EV Charger Type	Number of Charge Ports
Workplace – Level 2 (L2)	2,677
Public – Level 2 (L2)	1,858
Public – DC Fast Charging (DCFC)	542

PROJECTED EV CHARGING NEED BY 2030
(GOAL OF 25% EVS REGISTERED)

Curbside charging station development also be explored

Transportation Electrification Roadmap

- Identify best practices for effective education and outreach
- Development of materials and recommendations for stakeholder engagement

→ Create a DC EV Consumer Adoption campaign and guidance

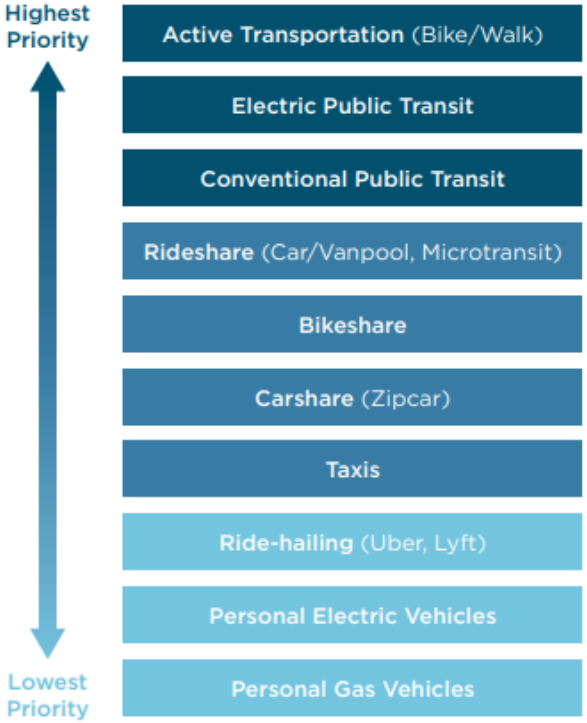
EV Adoption Campaigns:

- *Prioritizing diversity, equity, and inclusion in the electric transportation future*
- *Bus and fleet electrification*
- *Charging infrastructure at workplaces, public, private sites*
- *Dealership engagement*
- *Mobility solutions, like EV car sharing*

Transportation Electrification Roadmap

- Policy recommendations for Transportation Electrification

→ Identify and compare equity indicators of policies and incentives for transportation electrification among various stakeholders



Prioritization factors:

- Increased access to high quality mobility options
- Reduced air pollution
- Increased access to economic opportunities in disadvantaged communities.

Greenlining's Urban Transportation Equity & Emissions Prioritization Strategy

Transportation Electrification Roadmap

- EV Charging Policies and Incentives
  - → Charging opportunities for those that live in dense urban areas, in multi-unit dwellings (MUDs), and with no dedicated parking spot to charge.
  - → Ensure access to charging infrastructure in historically disadvantaged communities.
- District Bus Electrification
  - → Working with the Office of the State Superintendent of Education (OSSE) on a plan to transition the District's school bus fleet.
  - → Working with other District-based bus transit fleets.

EV Adoption - Vehicles

ICE: Internal Combustion Engine

Traditional automobile that uses liquid fuel (diesel, gasoline, etc.).

PEV: Plug-in Electric Vehicle

Battery Electric Vehicles, BEVs (all-Electric or 'pure' Electric Vehicles)

- Instead of an internal combustion engine, BEVs are powered by an electric motor and an on-board battery.
- No tailpipe, no emissions, more efficient, faster acceleration, quiet

Plug-in Hybrid Electric Vehicles (PHEVs)

- Have both an internal combustion engine and a small battery. Vehicle is powered from the battery until that is depleted, then switches to gas tank.
- Can be plugged into an electric power source to charge the battery.

EV Adoption - Vehicles

Why should I choose an electric car?

No more gas stations
You'll never have to stop for gas ever again. Charge your car at home overnight just like your phone, or at work if your employer offers workplace charging.

Top-of-the-line technology
The electric car dashboard display shows your battery's range, your current driving efficiency and navigation—all the must-have technology for today's driver.

A cheaper drive
In the District of Columbia, electric car drivers pay $1.16 to drive the same distance as a gallon of gas in a conventional car. They're cheaper to operate, with almost no maintenance costs. Just rotate your tires regularly and add fresh wiper fluid!

Turn down the radio
The next time you're in a conventional car, take a listen. We've all gotten used to the engine noise as part of the driving experience—but electric cars are nearly silent at all speeds.

Better Braking
With regenerative braking, electric cars help you to brake, leaving you to enjoy better range and a smoother ride on city streets.

Benefits for the economy and the environment
Electric cars are oil-free, produce 85% less carbon emissions and no smog, and can be powered by renewable energy sources like solar and wind.

EV Adoption - Vehicles

THE FUTURE IS ELECTRIC!

General Motors - 2035

The New York Times

Volvo Plans to Sell Only Electric Cars by 2030

CNBC

MARKETS BUSINESS INVESTING TECH POLITICS CNBC TV WATCHLIST PRO

AUTOS

Jaguar cars to go all-electric by 2025 as JLR plans full range of e-models by 2030

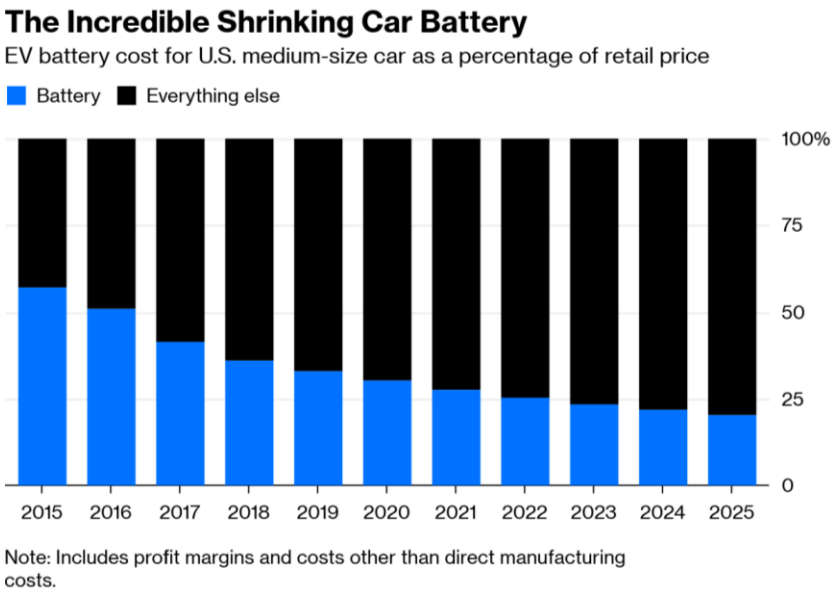
CAR AND DRIVER

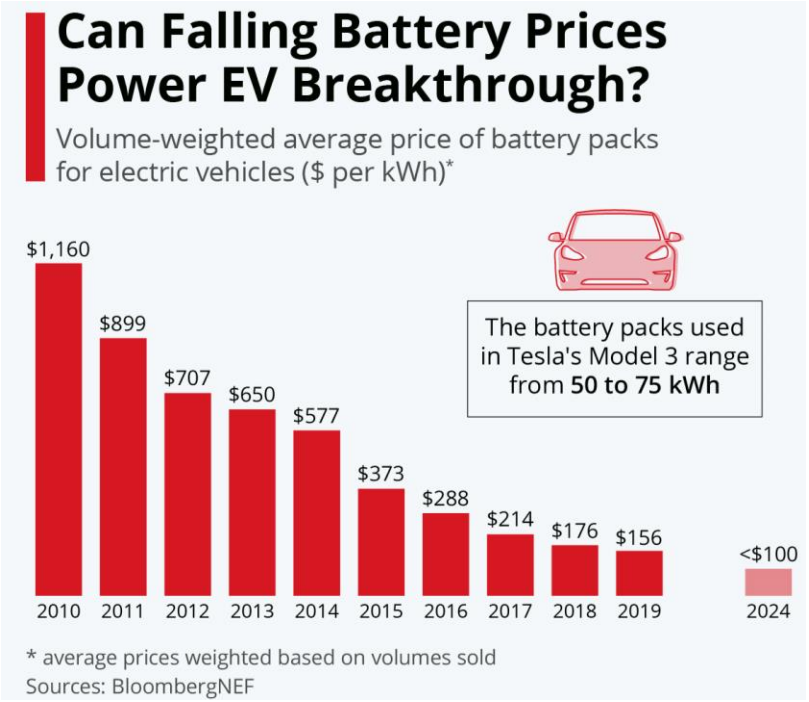
Ford Makes $29 Billion Commitment to Electric and Self-Driving Cars

As of January 2021, there are **nineteen (19)** battery-electric vehicle models available to buy new in the US.

- Models of the Nissan Leaf, Mini Cooper SE, Hyundai Ioniq and Chevrolet Bolt all come in ***under $30,000.00***
- At least 30 PHEVs available, many in the SUV class and eight (8) with MSRP ***under $30,000.00***

EV Adoption - Vehicles





EV Adoption – EV Charging Infrastructure

Electric Vehicle Supply Equipment (EVSE) or Charging Station

AC Level One

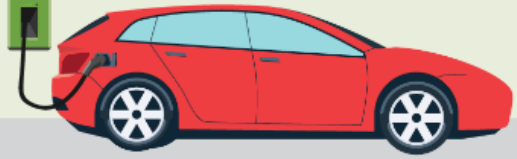
VOLTAGE
120v 1-Phase AC

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 Two



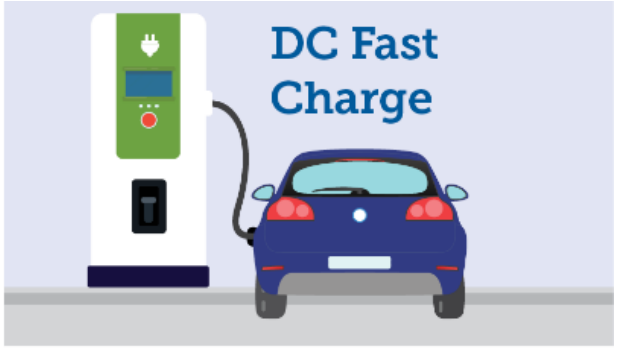
VOLTAGE
208V or 240V 1-Phase AC

AMPS
12–80 Amps (Typ. 32 Amps)

CHARGING LOADS
2.5 to 19.2 kW (Typ. 7 kW)

CHARGE TIME FOR VEHICLE
10–20 Miles of Range Per Hour

DC Fast Charge



VOLTAGE
208V or 480V 3-Phase AC

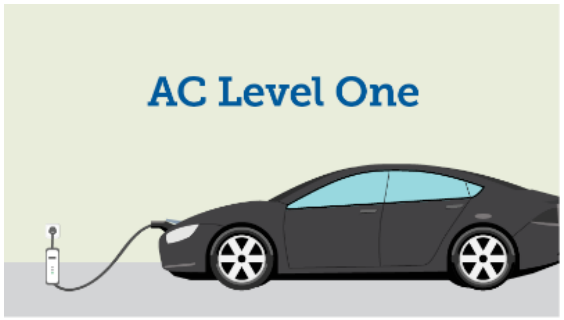
AMPS
<125 Amps (Typ. 60 Amps)

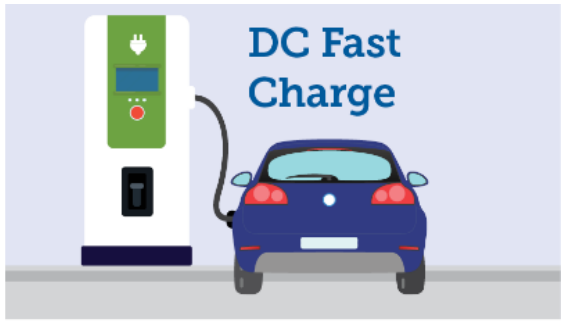
CHARGING LOADS
<90 kW (Typ. 50 kW)

CHARGE TIME FOR VEHICLE
80% Charge in 20–30 Minutes

EV Adoption – EV Charging Infrastructure

Electric Vehicle Supply Equipment (EVSE) or Charging Station





J1772 charge port

J1772 charge port

CCS charge port

CHAdeMO charge port

Tesla charge port

EV Adoption – EV Charging Infrastructure

CHAdeMO charge port

J1772 charge port

EV Adoption – EV Charging Infrastructure

HAZARD AWARENESS / SAFETY

- The car and all cords and equipment must be clear of sidewalks and other public right-of-ways.
- Charging at Level 1 does not require any special equipment besides an outlet, but does require a **dedicated branch circuit.**
- Use only approved extension cords.

Introduction to Mobility Equity

Mobility Equity:
All people have access to transportation that serves their needs at an equitable cost (both in time and in money). **Equitable transportation decisions therefore require meaningful community input.**

Twelve (12) equity indicators have been chosen and categorized based on their ability to measure and advance the **three goals:**

1. **Increasing access to high quality mobility options**
2. **Reducing air pollution**
3. **Increasing access to economic opportunities in low-income communities of color.**

Equity Indicators and Recommended Metrics

Goal #1: Increase Access to Mobility

1. Affordability	This metric will vary by transportation mode and location, and therefore should be set by the community; a recommended default is that households should spend no more than 20% of budgets on transportation costs[28]
2. Accessibility	Transportation mode is physically accessible (available in neighborhood), accessible to disabled people, accessible to people with various cultures/languages, accessible without the need for banking or a smartphone
3. Efficiency	Frequency of transit, travel times, time spent in traffic, optimal availability of parking, etc.
4. Reliability	Consistency and variability of travel times, predictability of travel times
5. Safety	Collision rate and severity;[39] personal safety issues (harassment, profiling, etc.)

Equity Indicators and Recommended Metrics

Goal #2: Reduce Air Pollution

6.	Clean Air and Positive Health Benefits	Quantities of air pollutants (PM, NOx) reduction,[40] level of physical activity, etc.
7.	Reduction in Greenhouse Gases	Quantities of greenhouse gas reduction[41]
8.	Reduction in Vehicle Miles Traveled	Compact development and greater clustering of destinations, VMT per capita

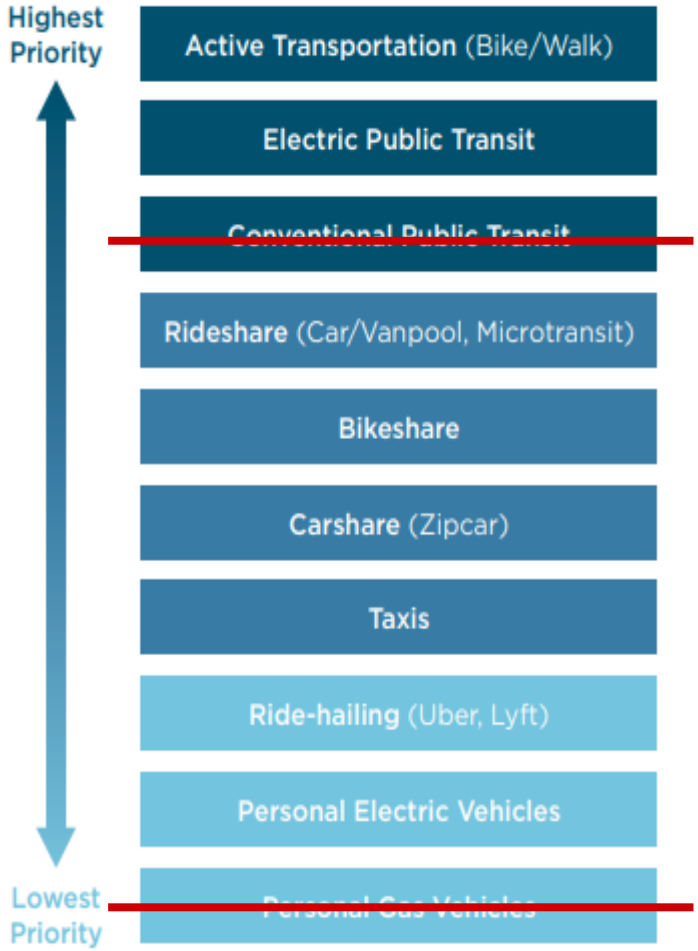
Achieved through sole focus on electrification

Equity Indicators and Recommended Metrics

Goal #3: Enhance Economic Opportunity

9. Connectivity to Places of Employment, Education, Services, & Recreation	Number of households by income within walking distance to schools and services. Number of households within 30-minute transit ride or 20-minute auto ride ofemployment center, etc[42] Number of transit transfers needed, time spent in transit.
10. Fair Labor Practices	Fair wages, basic employment benefits and protections throughout construction, operation, and maintenance
11. Transportation-Related Employment Opportunities	Direct and indirect employment throughout construction, operation, and maintenance
12. Inclusive Local Business & Economic Activity	Local hire agreements, increased foot traffic to local businesses, new businesses created, increased property values, benefiting the local community without displacing residents, etc.

EV Adoption Strategies



Micromobility refers to shared bicycles and electric scooters (docked or dockless).

Car Sharing products allow consumers to rent a car, typically by the hour, to meet their transportation needs. Model may be *station-based* or *free-floating*. **Bike/Scooter sharing** follows this model.

Ride Sharing/Hailing allows users to share a ride with other passengers in a single vehicle. Passengers will be dropped off at their predetermined locations.

EV Adoption Strategies

EV Group Buy Programs boost EV sales by taking advantage of community-driven EV promotion and dealership discounts to raise consumer awareness and heighten interest. EV Group Buys allow community members access to electric vehicles at a pre-negotiated, discounted price –often in addition to Federal, state and local incentives.

$32,300	Market Rate Price LEAF S[1]
- $10,000	Fleet Group Buy Deal
(Up to) - $7,500	Federal Tax Credit
(Up to) - $6,000	Colorado Tax Credit[2]
= $8,800	**Total cost after potential[3] savings**

2016 Colorado Example

Model	MSRP	Drive Green Discount	Dealer Price After Discount	Massachusetts State Rebate	Federal Tax Credit Eligibility	Final Drive Green Price
2018 Chevrolet Bolt	**$37,495**	**$6,000**	**$31,495**	**$2,500**	**$7.500**	**$21,495**

2018 Massachusetts Example

EV Adoption Strategies

Current Federal and District-Specific Incentives

Federal
• Vehicle: Tax credit up to $7,500 is available for EV purchase
• Infrastructure: Tax credit up to $1,000 for the purchase of qualified residential fueling equipment to the end of 2021.
District
• Reduced Registration Fees for High Efficiency Vehicles
• High Efficiency Vehicle Excise Tax Exemption
• Infrastructure Tax Credit - 50% of the allowable costs for the purchase and installation of a charging station at a private residence, not to exceed $1,000 per station at a private residence.
Pepco
• EV whole house time of use rate - take advantage of lower rates by shifting home's energy usage (including EV charging) to off-peak hours

EV Adoption Strategies

Workplace Charging

- Workplace charging can provide a regular place to charge especially for residents who don't have access to home charging.
- Employees with access to workplace charging are **six times** more likely than the average worker to drive an EV.

To start a discussion about a workplace charging program:

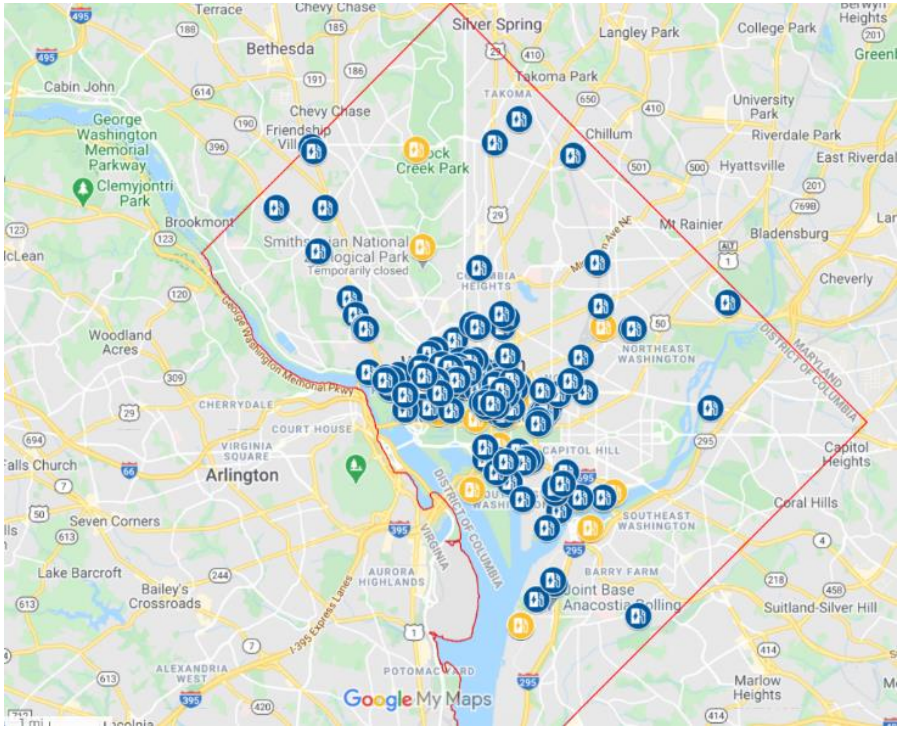
- Inform your employer you'd like to have workplace charging.

Resources for Employers

- Step-by-step guide to create a workplace charging program
- Survey assessment about charging needs
- Sample policy for workplace charging

EV Adoption Strategies

Equitable EVSE Placement



Current EV Charging Deployment

While our work on **equitable location of charging infrastructure** is just beginning, we want to hear about community stakeholders about their concerns regarding EVSE development in their communities.

EV Resources – Feedback

How Can We Improve These Resources?

What is missing?

What is unnecessary?

QUESTIONS

Questions?

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