

REGIONAL EV STRATEGY

EV Parking Guidelines & Stretch Code Updates

Thursday, February 16, 2023



REGIONAL EV STRATEGY



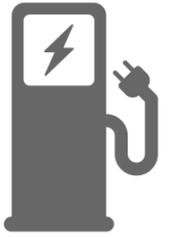
Today's Agenda

1:00 – 1:10 (10 minutes)	Welcome & Updates	Cara Goodman (MAPC) Alison Felix (MAPC)
1:10 – 1:20 (10 minutes)	Presentation from City of Boston – EV parking guidelines	Matthew Warfield, Boston Transportation Department
1:20 – 1:30 (10 minutes)	Presentation from MAPC – EV aspects of the new Stretch Code & Specialized Code	Sasha Shyduroff, MAPC Clean Energy Department
1:30 – 1:45 (15 minutes)	Q & A	All
1:45 – 2:25 (40 minutes)	Municipal Updates & Discussion	All
2:25-2:30 (5 minutes)	Wrap Up and Next Steps	Cara Goodman (MAPC) Alison Felix (MAPC)





DPU Order on Utility EV Dockets



On December 30, 2022, the MA DPU approved Electric Vehicle Infrastructure Programs proposed by Eversource, National Grid, and Unitil by issuing a [Final Order](#).

This approval will provide extensive Make-Ready programs and rebates for charging installation over the next several years for fleet, public, workplace, and residential customers for an estimated total of \$395 million!

Electric Utility	Approved Funding	Program Term
Eversource	\$188 million	4 years
National Grid	\$206 million	4 years
Unitil	\$1 million	5 years

After the utilities submit compliance filings detailing the rules of the approved programs, they can then establish the programs and offer the resources.

Source: <https://blog.greenenergyconsumers.org/blog/400-million-for-electric-car-charging-in-massachusetts>





New Energy Efficient Appliance Standards in MA

- Effective January 1, 2023, there are new energy-efficiency appliance standards in MA, that include Electric Vehicle Supply Equipment (EVSE), among other appliances.
- Must be Energy Star certified and be listed in the [State Appliance Standards Database \(SASD\)](#). (You can view the list of approved equipment by selecting EVSE and MA in the dropdown fields)
- Includes Level 1 and Level 2, not DCFC.
- For information about the Appliance Efficiency Standards, from which you can navigate to the law itself or learn more about the requirements: [Appliance Efficiency Standards Compliance for Sellers and Installers | Mass.gov](#)





EV Readiness Policy for the City of Boston

*Matt Warfield
New Mobility, Boston Transportation Department*

2/26/2023

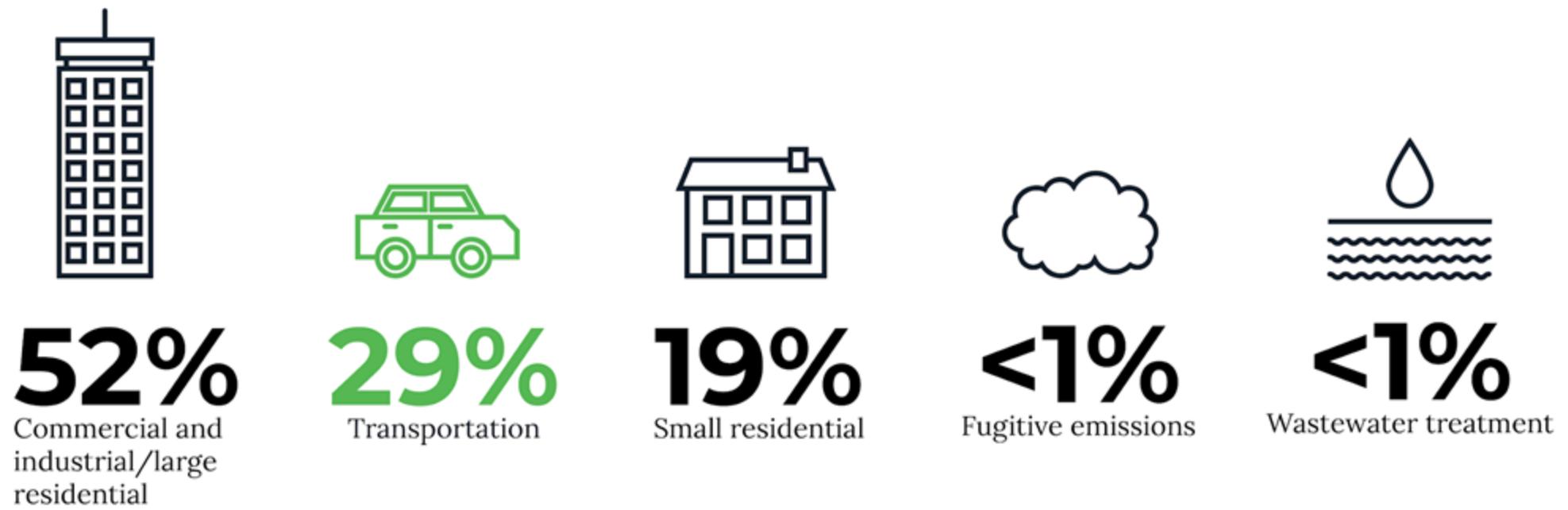


City of Boston
Transportation

CITY of BOSTON

Mayor Michelle Wu

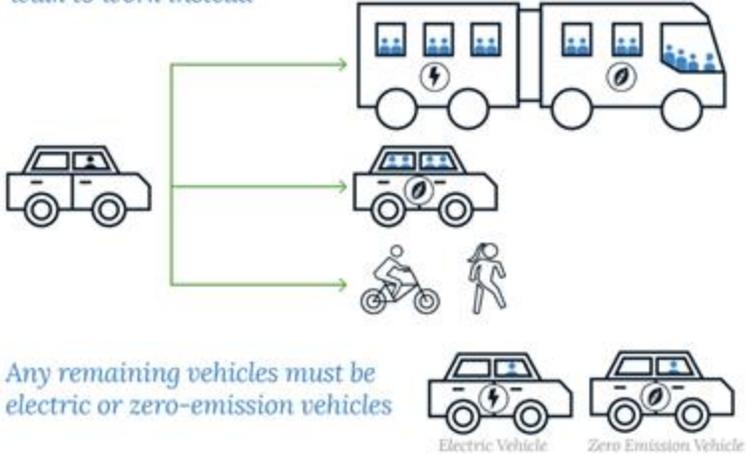
Carbon Neutral by 2050



Transportation accounts for nearly 1/3 of all emissions, 65% of which comes from passenger vehicles

Mode Shift and Transition to Zero Emission Vehicles

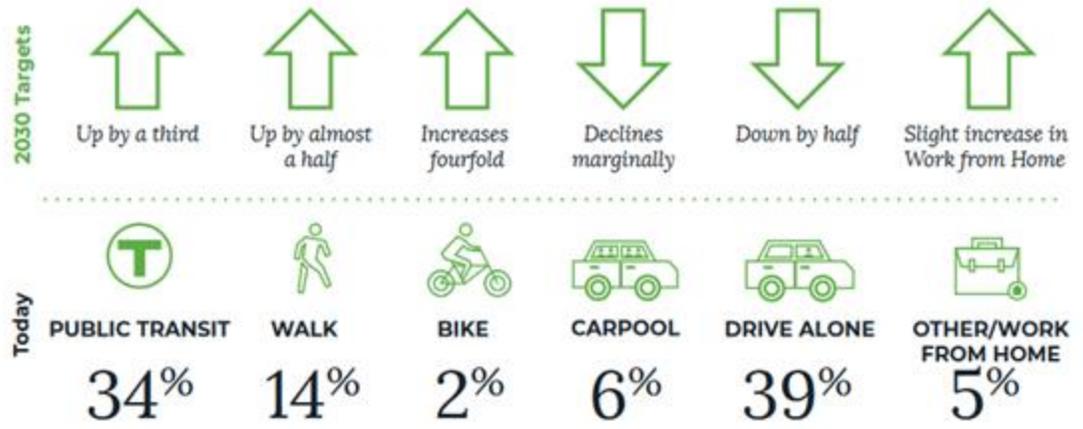
We need people who drive alone to take transit, carpool, bike or walk to work instead



Any remaining vehicles must be electric or zero-emission vehicles

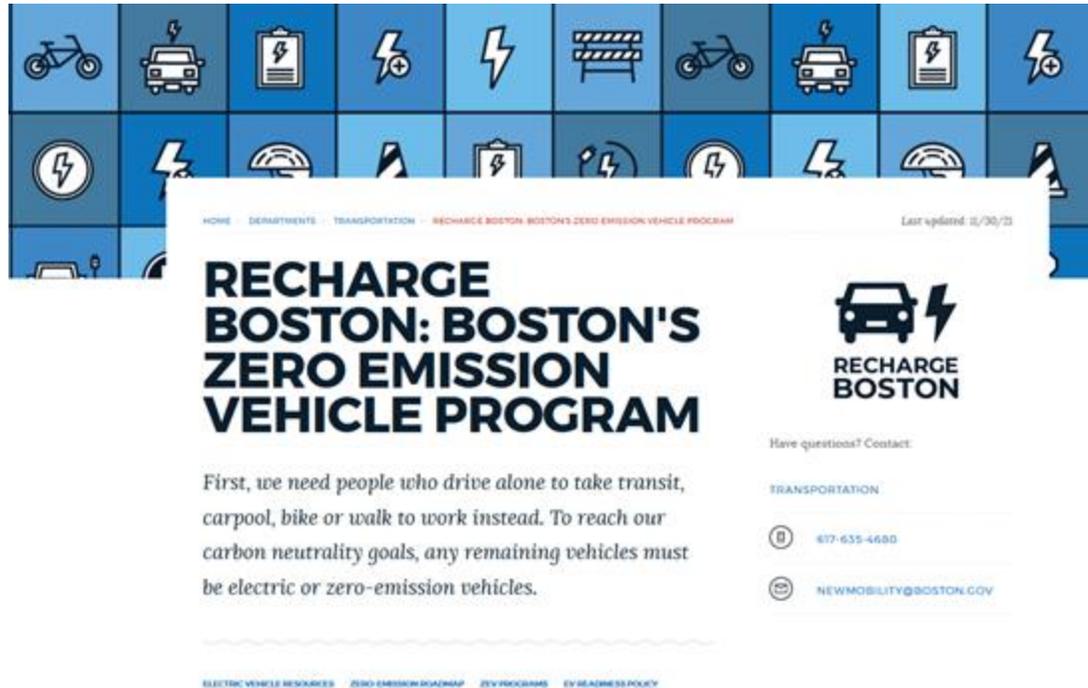
Image Source: City of Boston Climate Action Plan 2019

Go Boston 2030 Mode Shift Targets



Boston must maximize mode shift from single occupancy vehicles to shared and active modes, and transition all remaining vehicles to electric or other zero-emission vehicles

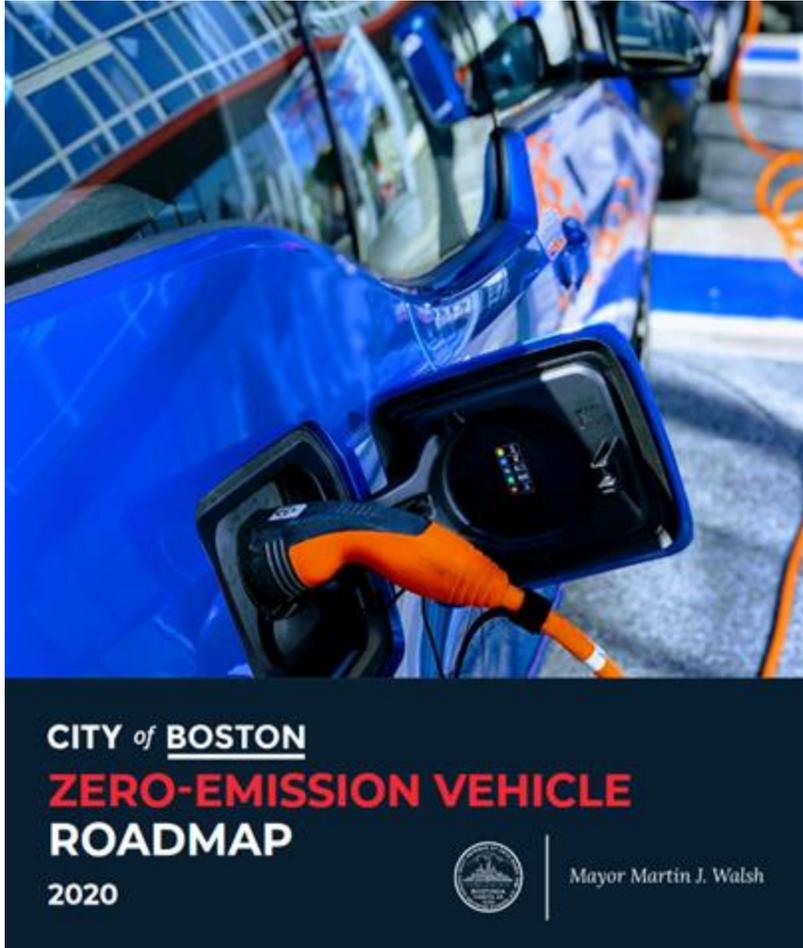
Recharge Boston - www.boston.gov/rechargeboston



We provide resources on how to install EV charging stations, start a workplace charging program, and general information on EVs. We link to resources provided by the State of MA and other organizations.



Zero-Emission Vehicle Roadmap

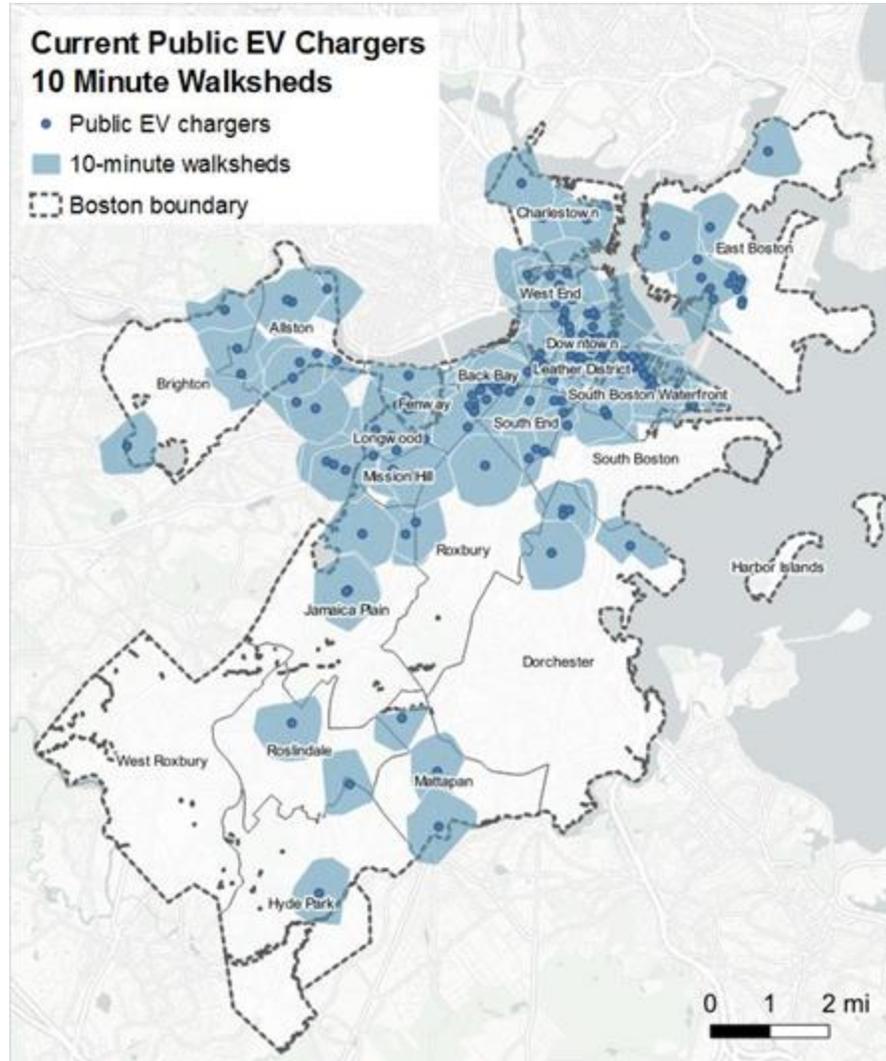


GOAL	ASPIRATIONAL TARGETS	ACTIONS
1 Support widespread adoption of electrification	<ul style="list-style-type: none"> 23% of all new car purchases in Boston are EVs by 2025 Every household will be within a 10-minute walk of an EV car share facility or a publicly accessible charging station by 2040 (also supports Goal 2) 	<p>EXISTING CITY PROGRAMS THAT WILL CONTINUE</p> <ul style="list-style-type: none"> Recharge Boston outreach materials and programs Small Vehicle Sharing Business Advisory Committee Mayor Walsh's 2019 legislative agenda includes an Act Relative to Transportation Network Company Rider Assessments <p>FUTURE ACTIONS</p> <ol style="list-style-type: none"> Develop TNC electrification policy/program Support the growth of personal and shared e-bike use Support shared micromobility charging infrastructure Release an RFP for an EV car share by FY2022 Explore opportunities to develop auto dealership and customer engagement programs
2 Ensure affordable, convenient access to charging infrastructure for all residents	<ul style="list-style-type: none"> Total EV charging plugs needed by 2025: 1,058 Level 2 and 300 DC Fast chargers that are City- or privately owned Free-to-access public charging infrastructure available in every neighborhood by 2023 	<p>EXISTING CITY PROGRAMS THAT WILL CONTINUE</p> <ul style="list-style-type: none"> Install EV charging stations in municipal lots EV Readiness Policy for New Large Developments Rights to Charge policy for condominiums <p>FUTURE ACTIONS</p> <ol style="list-style-type: none"> In addition to the 658 Level 2 charging plugs currently installed, the City of Boston will aspire to add 30% of the remaining needed Level 2 Charging plugs by 2025, installing in the charging plugs Develop a curbside charging policy and launch pilot by 2022 Explore expanding Rights to Charge to include rental properties
3 Electrify the municipal fleet	<ul style="list-style-type: none"> All vehicles purchased for General Fleet are electric or ZEVs, or bees in class if an appropriate ZEV is not available 100% of light-duty vehicles are emissions free by 2025 100% of medium-duty vehicles are emissions free by 2030 100% of heavy-duty vehicles are emissions free or low emissions by 2040 	<p>FUTURE ACTIONS</p> <ol style="list-style-type: none"> Operationalize green fleet purchasing policy to govern recurring purchases Develop strategic, cost-efficient, and future-proofed fleet charging station plan Test vehicle-to-grid technology Continue to align fleet procurement policy citywide best practice Streamline the fleet and shed and repurpose underutilized assets

1) Support widespread adoption of electrification

1) Ensure affordable, convenient access to charging infrastructure

Improving Access to EV Charging



Target: 100% of residents within a 10-minute walk of an EV Charger or EV car share by 2030

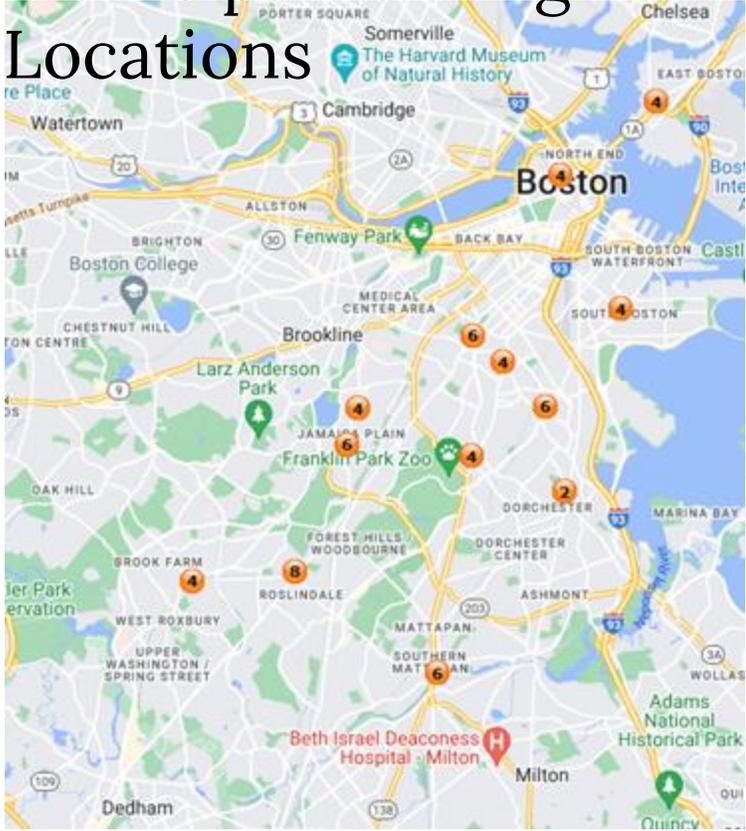
Current (as of 2020): 57% of residents are within a 10-minute walk of an EV Charging Station





Expanding Public EV Charging and EV Car Share in our Municipal Parking Lots

Municipal Parking Lot Locations



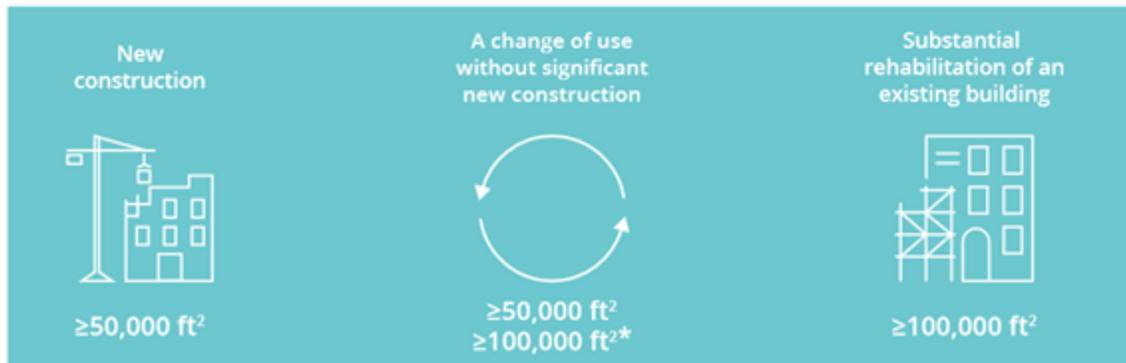
We have 62 LV plugs in 13 Municipal Parking Lots, 18 Planned

We are installing 4 LV III DCFC

We are working with our  City of Boston Transportation  CITY of BOSTON | Mayor Michelle Wu

EV Readiness Policy for Article 80 and Parking Freeze Zones

When It Is Used

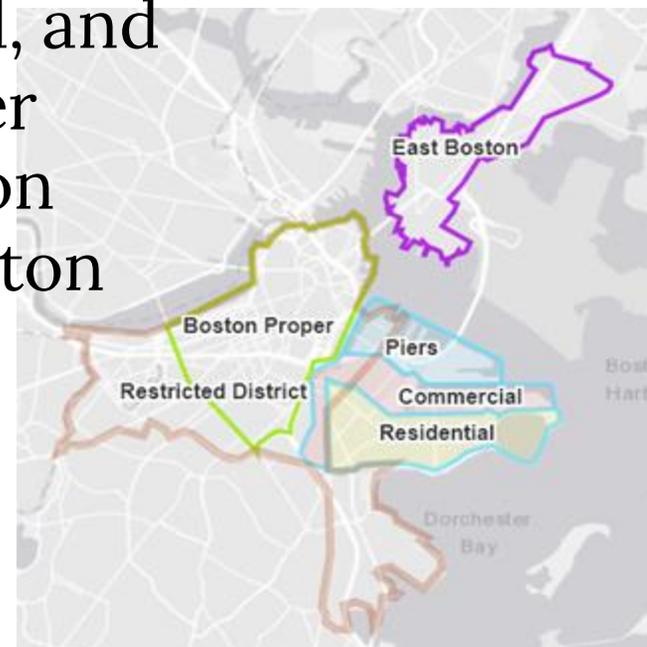


Article 80 Review:

- New construction 50,000 square feet or greater
- A change of use without new construction, 50,000 square feet or greater
- Substantial rehabilitation of existing

Parking Freeze Zones:

- Downtown
- Parts of Fenway, Back Bay, South End, and Dorchester
- East Boston
- South Boston



Article 80 Process



TRANSPORTATION DEVELOPMENT REVIEW FOR LARGE PROJECTS



WHAT TRIGGERS TRANSPORTATION DEVELOPMENT REVIEW FOR LARGE PROJECTS?

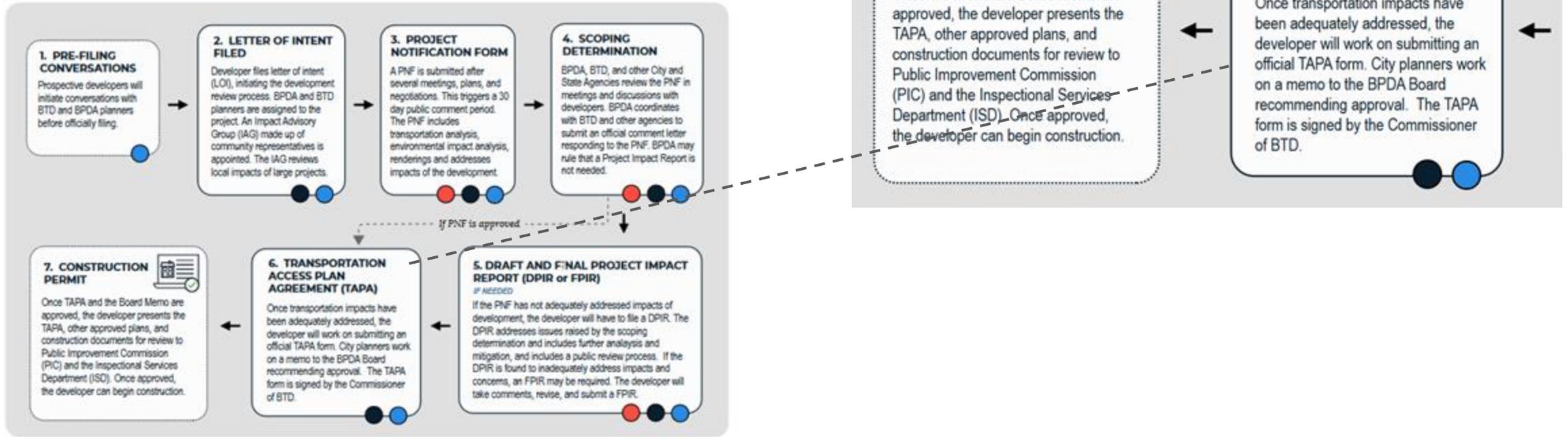
- NEW CONSTRUCTION** ≥ 50,000 SQ FT
- CHANGE IN USE FOR** ≥ 50,000 SQ FT OR ≥ 100,000 SQ FT IN DOWNTOWN
- REHABILITATION OF AN EXISTING BUILDING** ≥ 100,000 SQ FT

HOW DOES IT WORK?

The flowchart below highlights the Boston Transportation Department's (BTD) involvement in the development review process. The site plan and neighborhood improvements agreed to through this process are formalized between BTD and the developer in the Transportation Access Plan Agreement (TAPA).

LEGEND

- Meetings with BTD on for transportation improvements and programs
- Development proposal officially under review
- Public Meetings and formal comment periods



TAPA Requirements

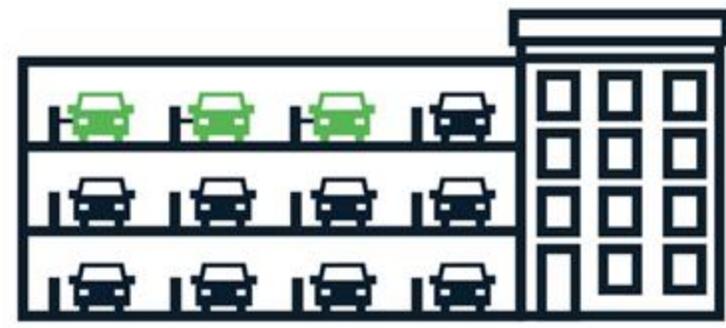
Transportation Demand Management

	Strategy Type	Strategy	Points towards TDM Target
BASELINE	Programming	TMA Membership*	5
	Programming	On-Site TDM Coordinator*	
	Programming	Marketing*	
	Programming	Annual Events*	
	Programming	Real-Time Transit Information*	15
	Programming	Emergency Ride Home**†	
	Transit	Participation in MBTA Perq Program*	
	Vehicle	Unbundled, Market-Rate Parking*	
IMPACT	Bicycle	Bicycle Parking/Bike Share Provision*	5
	Transit	Transit Subsidy	15 - 35
	Vehicle	Parking Reduction	15 - 30
ELECTIVE	Vehicle	Parking Pricing	5 - 30
	Bicycle	Bike Share Membership Subsidy	5-8
	Bicycle	E-Bike/E-Cargo Bike Program	5
	Bicycle	Additional Bike Parking Spaces	2-5
	Bicycle	Multimodal Transportation Subsidy	10
	Vehicle	Parking Cashout†	10
	Vehicle	Carpool Program w/ Preferential Spaces	5-10
	Vehicle	Car Share Membership/Subsidy	2-4
	Vehicle	Car Share Parking	3-6
	Transit	Shuttle Service	5-10
	Transit	Bus Stop Improvements	2-4
	Development	Mixed-Use Development	5-20
	Development	Bundled Transportation Options (GoHubs!)	4

Active Transportation Requirements

TABLE 1: REQUIRED RATES FOR DIFFERENT LAND USES

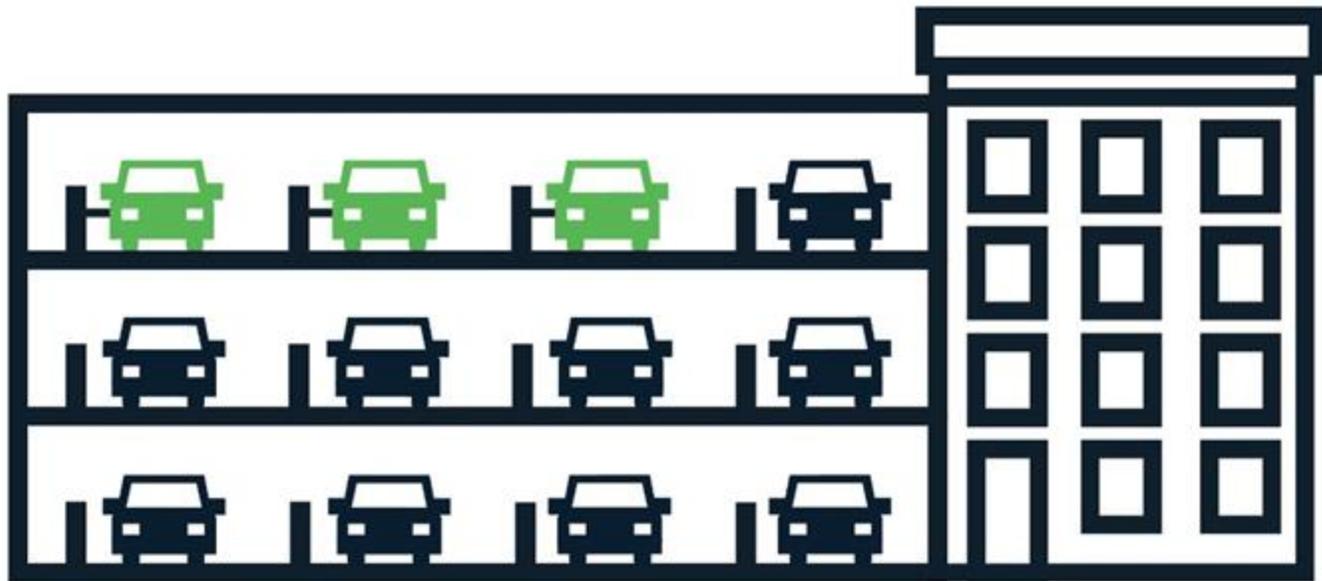
	BUILDING USE	VISITOR PARKING SPACES (short-term)	EMPLOYEE/RESIDENT PARKING SPACES (long-term)	SHOWERS †	LOCKERS ‡	BIKESHARE STATIONS †	BIKESHARE CONTRIBUTION
RESIDENTIAL	1 to 3-Unit	N/A	1 per unit	N/A	N/A	N/A	N/A
	Multi-Unit (4 or more units)	1 per 5 units (4 minimum)	1 per unit (0.5 per unit for senior housing)	N/A	N/A	Space for a 15-dock or 19-dock station	\$275 per unit (\$75K or \$49K minimum)
	Institutional Housing (College, university, and other)	1 per 20 beds (4 minimum)	1 per 2 beds	N/A	N/A	Space for a 15-dock or 19-dock station	\$37.50 per bed (\$75K or \$49K minimum)
NON-RESIDENTIAL	Office/Admin	1 per 20,000 sf (6 minimum)	1 per 2,500 sf	1 per 60,000 sf (1 minimum)	1 per 6,000 sf (1 minimum)	Space for a 15-dock or 19-dock station	\$0.28 per sf (\$75K or \$49K minimum)
	Industrial	1 per 40,000 sf (6 minimum)	1 per 12,000 sf (6 minimum)	1 per 480,000 sf (1 minimum)	1 per 48,000 sf (1 minimum)	Space for a 15-dock or 19-dock station	\$0.30 per sf (\$75K or \$49K minimum)
	Retail	1 per 5,000 sf	1 per 3,000 sf	1 per 60,000 sf (1 minimum)	1 per 6,000 sf (1 minimum)	Space for a 15-dock or 19-dock station	\$0.27 per sf (\$75K or \$49K minimum)
	Institutional †	1 per 2,500 sf	1 per 2,500 sf	1 per 20,000 sf (1 minimum)	1 per 2,000 sf (1 minimum)	Space for a 15-dock or 19-dock station	\$0.42 per sf (\$75K or \$49K minimum)
	Lodging (Hotels, motels, inns, hostels)	1 per 20,000 sf (6 minimum)	1 per 5,000 sf	1 per 20,000 sf (1 minimum)	1 per 2,000 sf (1 minimum)	Space for a 15-dock or 19-dock station	\$75K or \$49K minimum



Large project review developments must equip 25% of their total parking spaces to be EVSE (electric vehicle supply equipment) installed and the remaining 75% of the total spaces to be EV (electric vehicle) ready.

EV Readiness Requirements

EV Readiness Policy for New Developments



 **EV CHARGING STATIONS**  **EV READY CHARGING STATIONS**

Large project review developments must equip **25%** of their total parking spaces to be EVSE (electric vehicle supply equipment) installed and the remaining **75%** of the total spaces to be EV (electric vehicle) ready.

EVSE Installed: 25% of all parking spaces associated with the development must have a Level 2 EV charging plug dedicated per space, or the equivalent thereof must be provided.

EV Ready: Raceway to every parking space, adequate space in the

EV Readiness Policy Equivalency Calculator

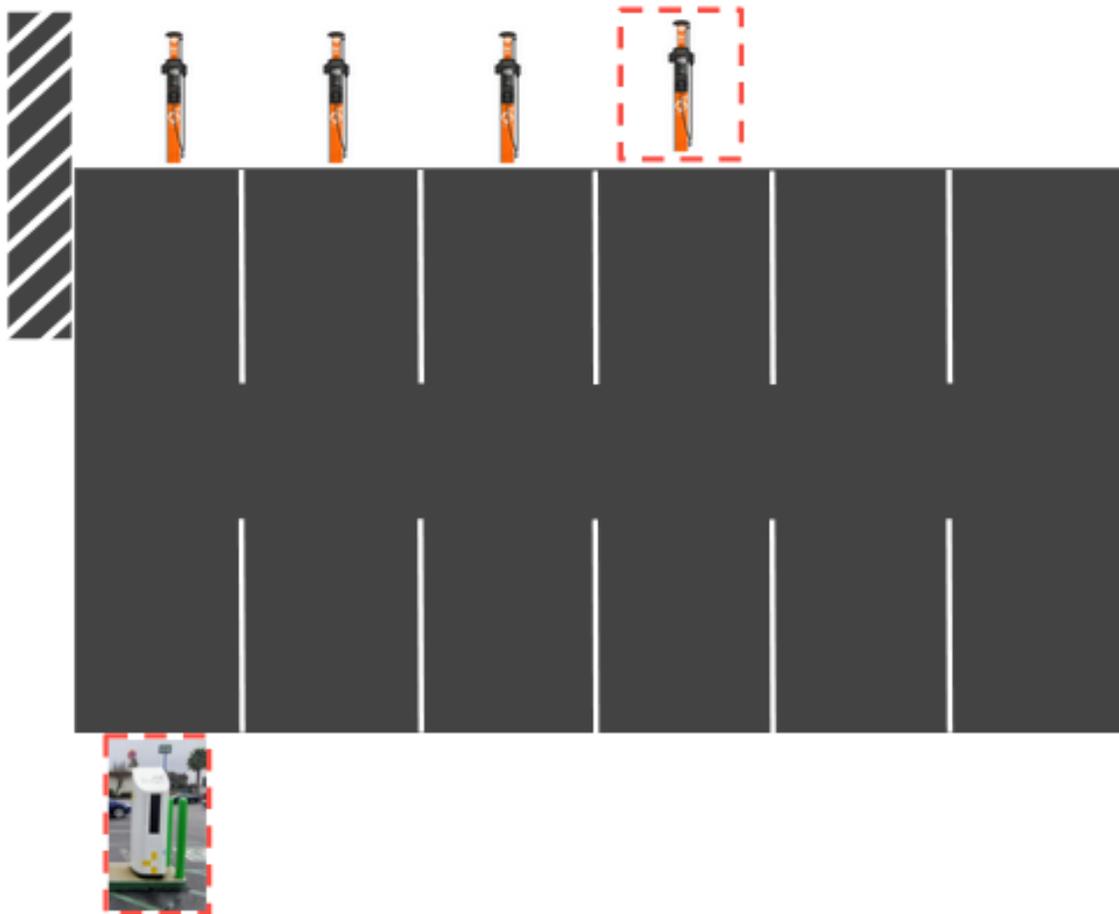


CATEGORY / NAME / OPTIONS	WEIGHTED POINTS (PER MITIGATION MEASURE)	RESTRICTION/RANGE
LEVEL 1 CHARGER	1	Only land uses classified as Residential and/or Office may offset with this option. Parking spaces must be assigned for residential.
LEVEL 2 CHARGER	1	
DCFC - 50KW	8	
DCFC - 150KW	24	
EV CAR SHARE	19	
ELECTRIC BIKE PARKING	0.25	Maximum of 5 points.

- The 25% requirement is calculated at one point per parking space.
- EVSE Installed does not necessarily mean an EV charging station will be installed. This calculator details the point values for different equivalency measures.

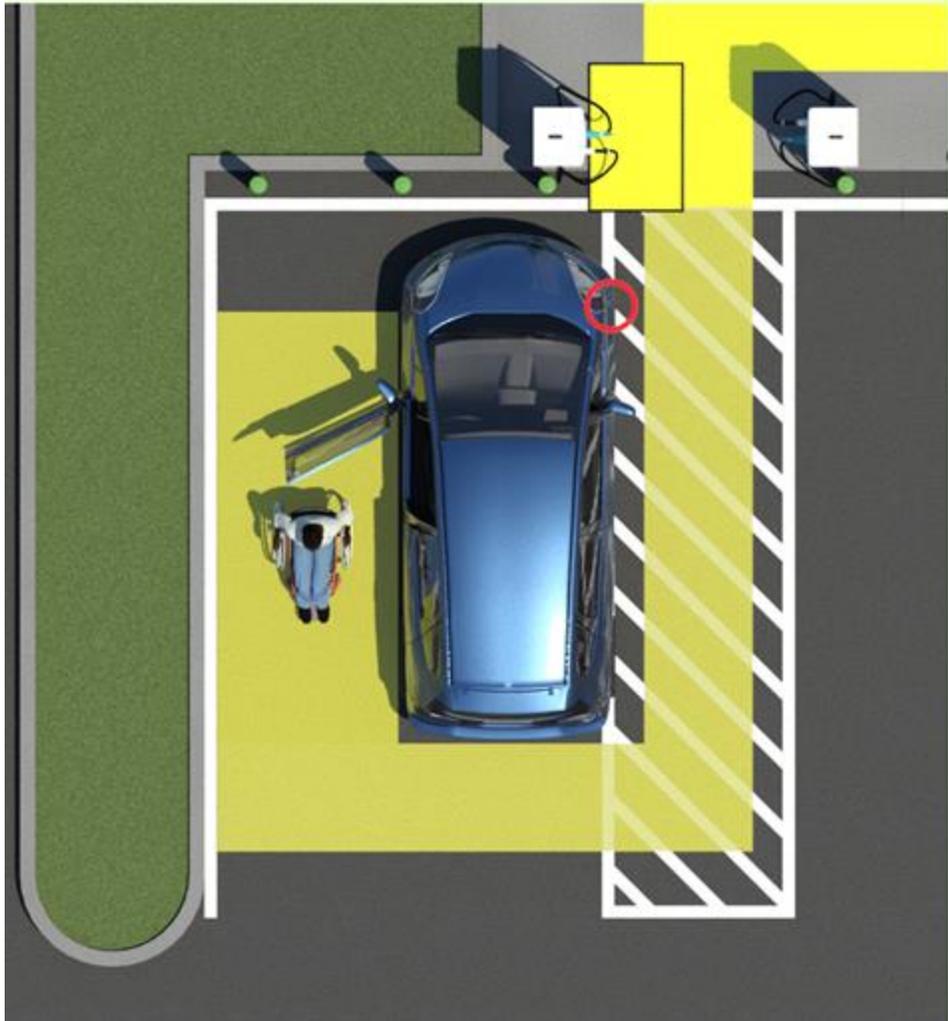


Example: 12 Parking Space Lot



- 12 parking spaces = 12 points
- 25% EVSE Installed requirement = 3 points. 3 LV II plugs are installed for 1 point each.
- Remaining EVSE Ready = 9 points. Conduit is run to two parking spaces and electrical capacity and room for the transformer

ADA Accessibility



- US Access Board released updated accessibility design requirements in 2022
- EV chargers installed at privately-owned residential housing are not subject to the ADA. However,





Policy Impact To Date

- Policy applied to to any development that receives Boston Planning and Development Agency Board approval after **March 7, 2019** and to any development that submits a parking freeze permit application to the Air Pollution Control Commission after March 20, 2019.
- TAPAs can be signed well in advance of a building being constructed, in most cases five years or more
- It will take some time for the TAPAs that include the 25% requirement are constructed and we start to see the impact

Year	# of Parking Spaces Approved	25% EV Installed	Under pre-2019 Policy of 5%
2022	17,227	4,307	861
2021	8,668	2,167	133

- In 2022 the BPDA approved developments that will add 17,227 parking spaces, and in 2021 they approved 8,668 parking spaces



Potential Changes to an Updated Policy

- Evaluate 25% requirement with potential to increase the %
- Require API access to data to confirm installation, uptime, and usage information
- Remove LV I charging as an option
- Review EV ready requirement for practicality, and bring in-line with mode-shift and car use reduction goals
- Incorporate points for public access EV charging with an emphasis on LV III DCFC
- Incorporate points for car alternatives, such as shared e-bikes, e-scooters, and e-cargo bikes



Codes for Climate: Stretch Code and Specialized Code EV Readiness Requirements

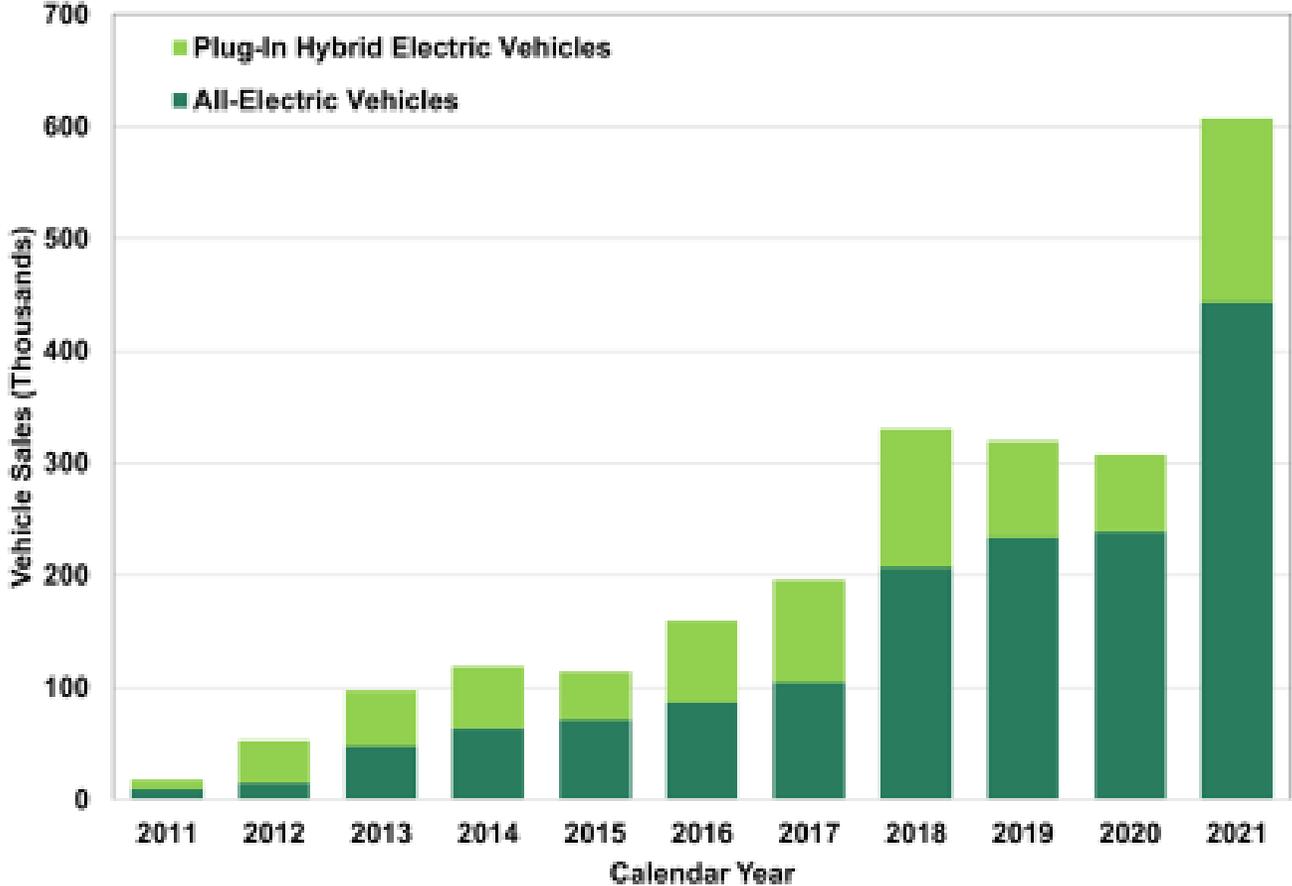
February 16th, 2023

Why Address Climate Through Building and Electrical Code?

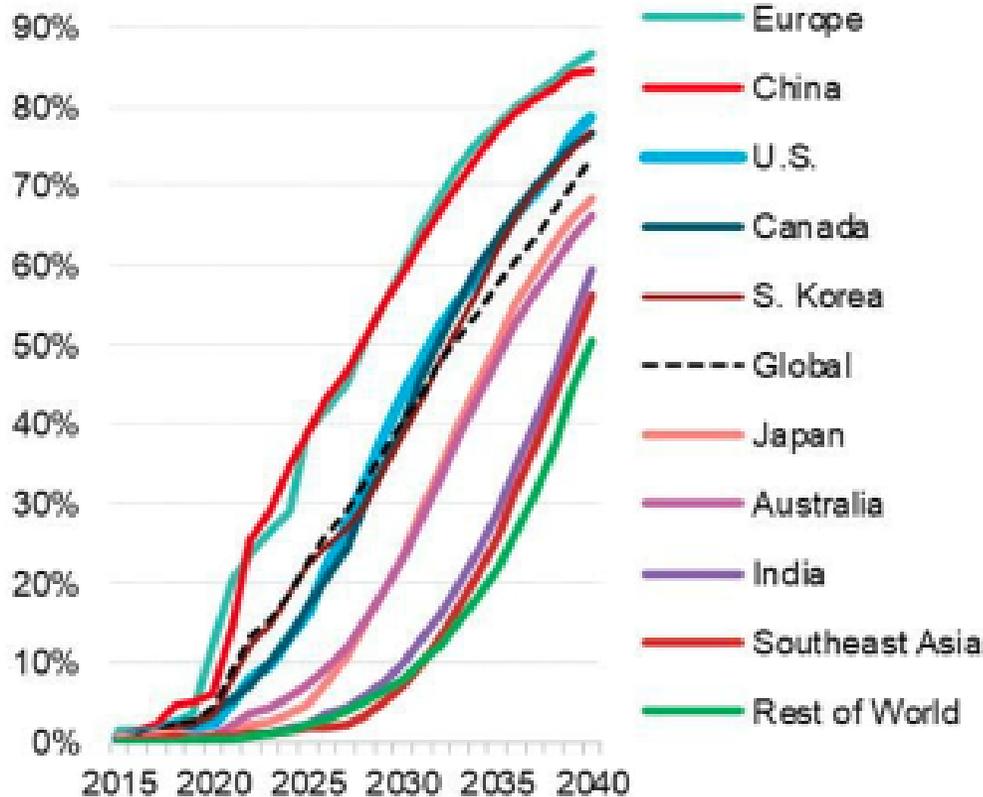
- 2008 Green Communities Act
 - Base Energy Code and established the Stretch Energy Code alongside the Green Communities Program
- 2021 Climate Act
 - 50% emission reduction by 2030
 - Gave authority to DOER to update the Stretch Code and to develop a municipal opt-in Specialized energy code that includes
 - Net Zero building performance standard
 - Definition of net-zero building
 - Designed to achieve MA GHG emissions limits
 - May be phased in by building type

Growth of Electric Vehicle Sales

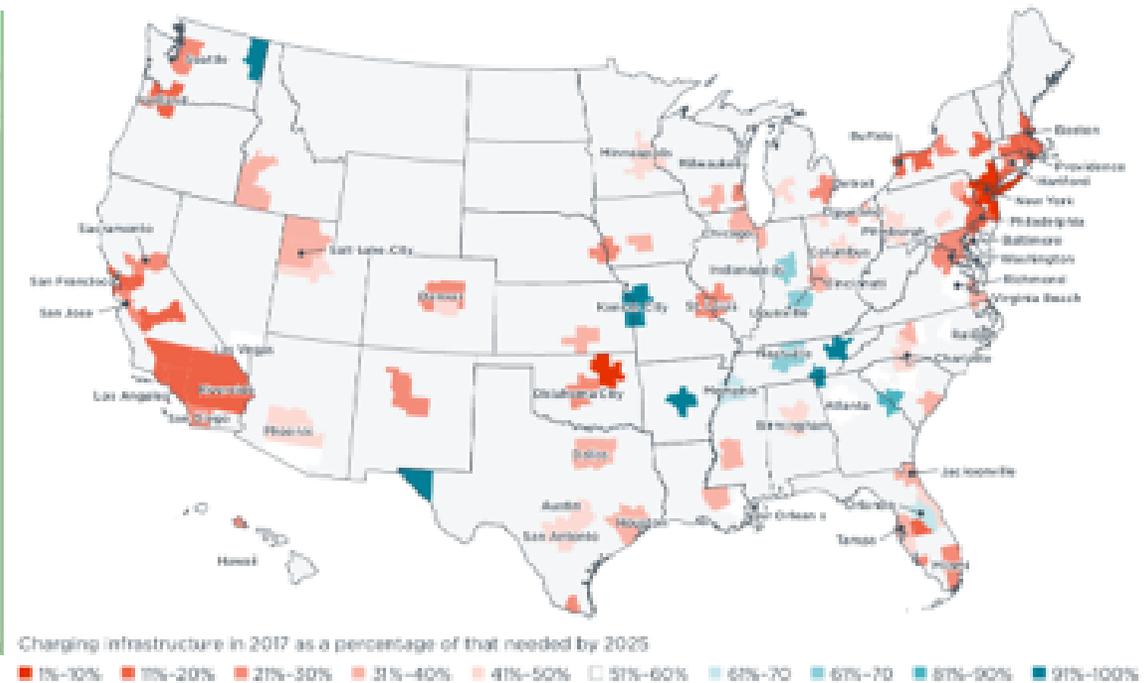
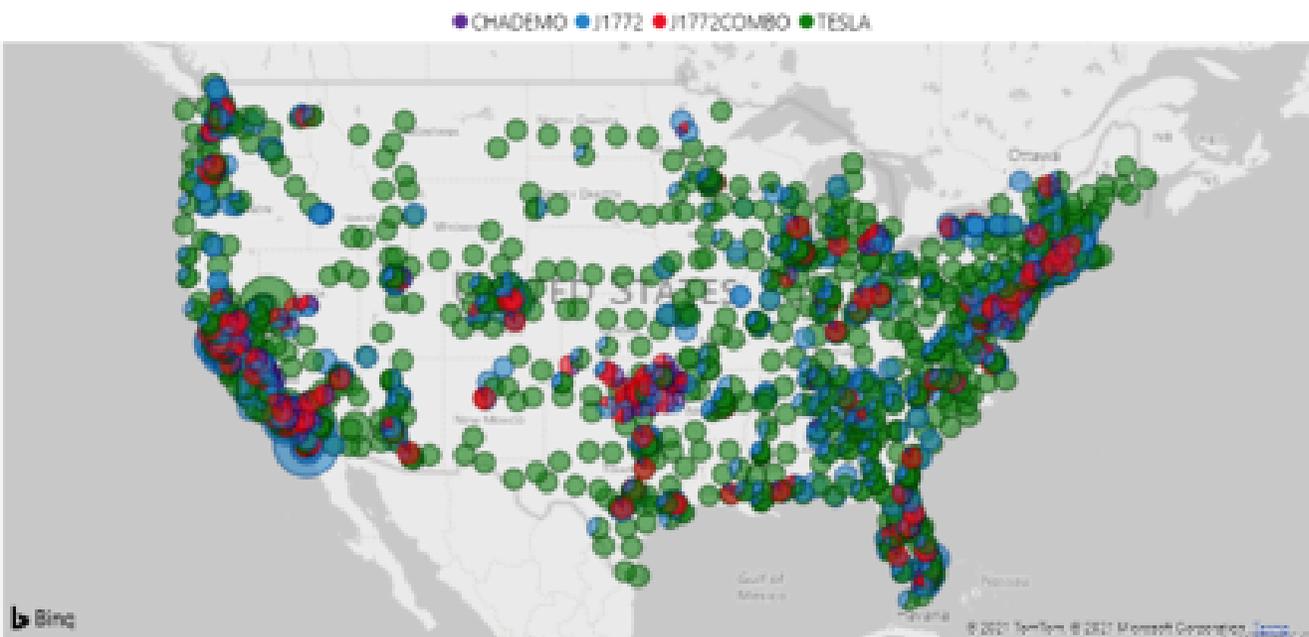
U.S. Light-Duty Plug-in Vehicle Sales by Type, 2011-2021



Global long-term EV share of new passenger vehicle sales by market - Economic Transition Scenario



The Growth and Need for EV Chargers



176% growth in from 2020-2022
109,500 ports at 52,400 locations
25,300 fast charging at 6,500 locations

Of the 100 most populous metro areas, 88 had less than half of the needed charging infrastructure in place for 2025 based on expected EV growth.

	Current Base Code	Updated Stretch Code	Specialized Code
# Jurisdictions	51 communities	300 communities	Requires special adoption
Code	IECC 2018 with MA Amendments	IECC 2021 with MA amendments + Stretch Code Amendments	IECC 2021 with MA Amendments + Stretch Code Amendments + Specialized Code Appendices
Timeline/Effective Date	to be updated in 2023 by BBRS and effective estimates Jan 2024	Residential: Jan 2023 Commercial: July 2023	6-11 months after adoption; recommended July 1st or January 1st
Goals	Ensure new construction is built with energy efficiency in mind	More energy efficient than base code	Consistent with MA state GHG limits and targets

EV Requirements

	Current Base Code	Updated Stretch Code	Specialized Code
EV CHARGING RESIDENTIAL CODE (low-rise)	PROPOSED 1-2 family- 1 space per dwelling; Other R uses minimum of 10% of spaces to be wired for EV charging	1-2 family- Requires 1 space per dwelling; Other R uses minimum 20% of spaces to be wired for EV charging	1-2 family- Requires 1 space per dwelling; Other R uses minimum 20% of spaces to be wired for EV charging
EV CHARGING COMMERCIAL CODE	PROPOSED requires wiring for 10% of new parking spaces	Group R & B- Minimum 20%; All other occupancies 10%	Group R & B- Minimum 20%; All other occupancies 10%

* Subtype R- Residential Use B- Business Use Occupancies in the

Key Definitions

- **ELECTRIC VEHICLE.** An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Informational note: defined as in 527 CMR 12 section 625.2.
- **ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE):** The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle. Informational note: defined as in 527 CMR 12 section 625.2.

Key Definitions

- **ELECTRIC VEHICLE READY PARKING SPACE (“EV READY SPACE”):** A designated parking space which is provided with wiring and electrical service sufficient to provide 240 volt AC Level 2 or equivalent EV charging, as defined by Standard SAE J1772 for EVSE servicing light duty electric vehicles.
- **R404.4 Wiring for Electric Vehicle Ready Parking Spaces (“EV Ready Spaces”).** EV Ready Spaces shall be provided in accordance with Table R404.4. The dedicated branch circuit shall be identified as “EV READY” in the service panel or subpanel directory, and the termination location shall be marked as “EV READY”. The circuit shall terminate in a NEMA receptacle or a Society of Automotive Engineers (SAE) Standard SAE J1772 electrical connector for EVSE servicing Electric Vehicles, located within 6 feet (1828 mm) of each EV ready space. Conductors and outlets for EVSE shall be sized and installed in accordance with the MA electrical code.

Residential Code- TABLE R404.4 EV READY PARKING SPACE REQUIREMENTS

- 1 & 2 family dwellings and town homes- At least 1 50-amp branch circuit per dwelling unit to provide for AC Level II charging
- All other R-use buildings At least 20% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA.

Exceptions:

1. In no case shall the number of required EV Ready Spaces be greater than the number of parking spaces installed.
2. This requirement will be considered met if all spaces which are not EV Ready are separated from the premises by a public right-of-way.
3. R-2 multi-family properties may elect to comply with Commercial EV ready requirements in C405.13.
4. One or more SAE Level II spaces may be substituted with multiple SAE Level I spaces provided with wiring for a minimum 20amp, 120 volt EVSE, with a ratio of at least 3 Level I spaces for each Level II space required.

FAQ (From Mass Save Energy Code Technical Support)

- **Does the wire have to be run to the parking spot?** Yes.
- **What if the house doesn't have a garage?** The code requires the circuit to terminate within 6 ft of the parking spot regardless of whether there is a garage- may terminate on side of the house or a post.
- **Does EV readiness apply to additions and alterations?** No.
- **What if there is no on-site parking at the building?** The EV readiness doesn't apply/is exempt if parking is separated by public right of way.

Resources and Trainings

- DOER Technical Support Questions: Stretchcode@mass.gov
- Mass Save Energy Code Technical Support Program Call [1-855-757-9717](tel:1-855-757-9717) or email energycodesma@psdconsulting.com

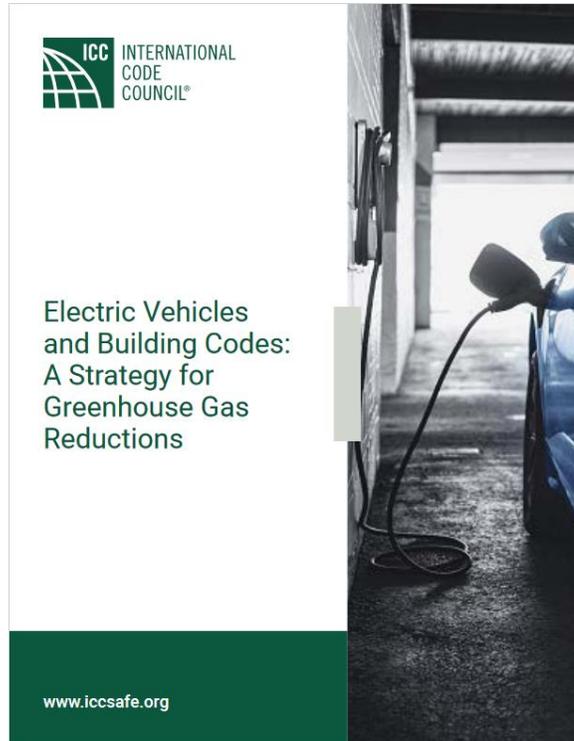
Websites:

- [Building Energy Code | Mass.gov](#)
- [Energy Code Training and Events \(masssave.com\)](#)

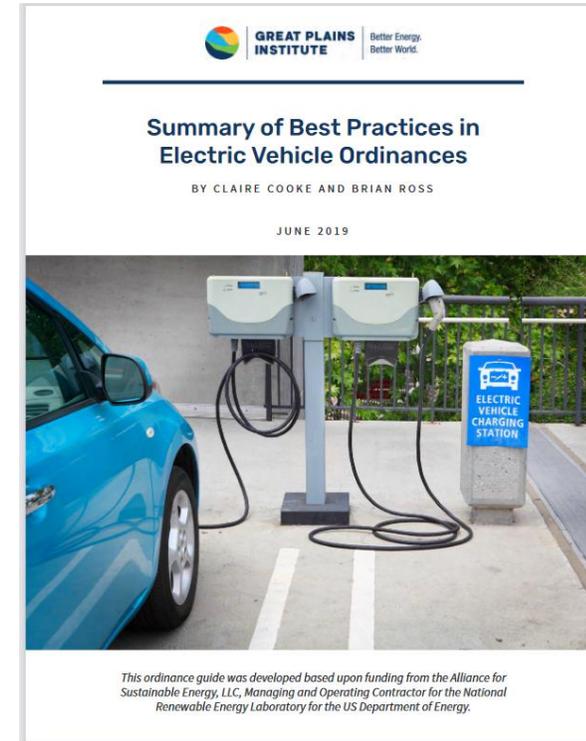
Upcoming MAPC Webinars

- **Codes for Climate #2: Mass Save Electrification Incentives-** Wednesday, March 1st at 12:00 p.m.
- **How Healthy Homes are Tackling the Housing and Climate Crises-** Tuesday March 7th at 1:00 p.m.
- **Accelerating Climate Resilience: Resilience Hubs-** Tuesday, February 28 at 11:00 a.m.
- **Energy Efficiency and Conservation Block Grant (EECBG) Funding for Massachusetts Municipalities-** Thursday, March 16 at 11:00 a.m.

Additional Resources



[Electric Vehicles and Building Codes: A Strategy for Greenhouse Gas Reductions](#)
International Code Council (2021)



[Summary of Best Practices in Electric Vehicle Ordinances](#)
Great Plains Institute (2019)



Examples of Interest

Madison, Wisconsin

Ordinance includes a schedule to increase the percentage of EV-ready and EV-installed parking every five years (residential and commercial).

Vancouver, Canada

Building Code Bylaw requires multifamily dwellings to have 100 percent of parking spaces to be EV-ready.

St. Paul, Minnesota

Has a required "overlay" for construction projects receiving public assistance funds and rehab projects that includes EV charging capability.

Sources:

[Electric Vehicles and Building Codes: A Strategy for Greenhouse Gas Reductions](#) International Code Council (2021)

[Summary of Best Practices in Electric Vehicle Ordinances](#) Great Plains Institute (2019)



Municipal Updates

- Name, pronouns, municipality, and position / role
- One success
- One challenge



FACT SHEET: Biden-Harris Administration Announces New Standards and Major Progress for a Made-in-America National Network of Electric Vehicle Chargers Issued February 15, 2023

Made in America Policies and New Technical Standards that Support the Future of the EV Charging Industry

- FHWA published final minimum standards for agency-funded EV charging infrastructure.
- Guidance on how the Build America, Buy America Act will apply to agency-funded EV chargers.

Public and Private Actions that Accelerate Buildout of National Network and Catalyze Manufacturing



2023 Schedule

Thursday April 13th

1:00 – 2:30

Topics TBD

If you aren't already on our invite list, please email cgoodman@mapc.org to be added for future meetings



REGIONAL EV STRATEGY

