

# Electric Vehicles 101

National Drive Electric Week 2021



# Clean Fuels Michigan

- Non-partisan nonprofit trade association
- **Mission:** To accelerate the transition to clean transportation in Michigan. We advocate for the suite of alternative fuels including biofuels, hydrogen, propane, natural gas, and electric vehicles.
- **Vision:** A bright, prosperous, and sustainable Michigan that is a national leader in clean fuels.





# How do electric vehicles work?

- Instead of an internal combustion engine, electric vehicles have an electric motor, which is powered by a large battery pack. There is no engine, transmission, or tailpipe!





# Range

- Range = Number of miles a vehicle can go on a single charge
- Most new passenger vehicles can reach 300 miles per charge



# Charging can be as simple as plugging into an outlet

## Level 1

- Standard in homes and buildings
- 2-5 miles of range per hour

## Level 2

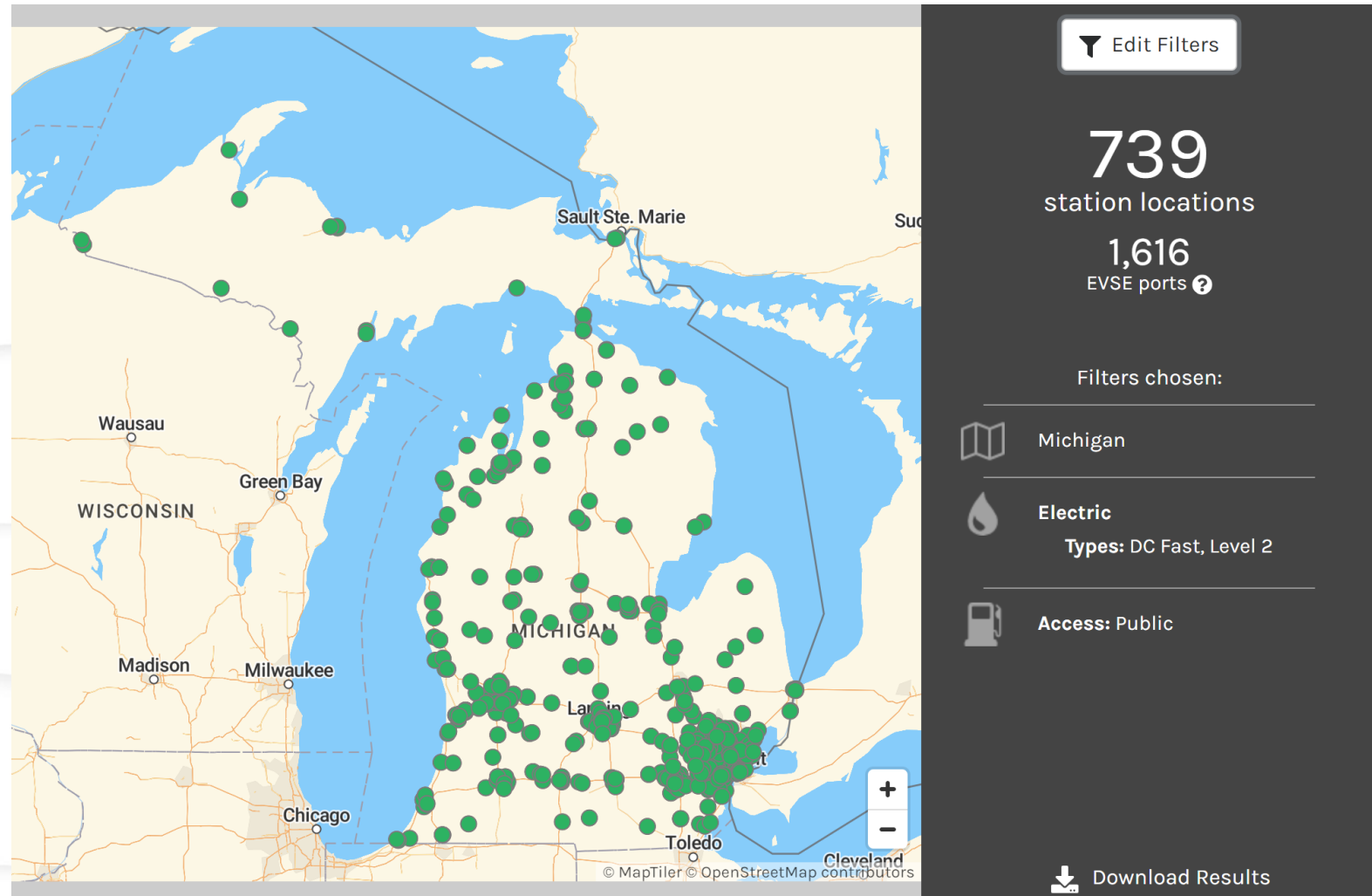
- Requires installation of charging equipment
- 20+ miles of range per hour
- Homes, workplaces, public chargers

## DC Fast Charging

- High-powered specialized equipment
- 60-100 miles of range per 30 minutes
- Public locations, high traffic corridors

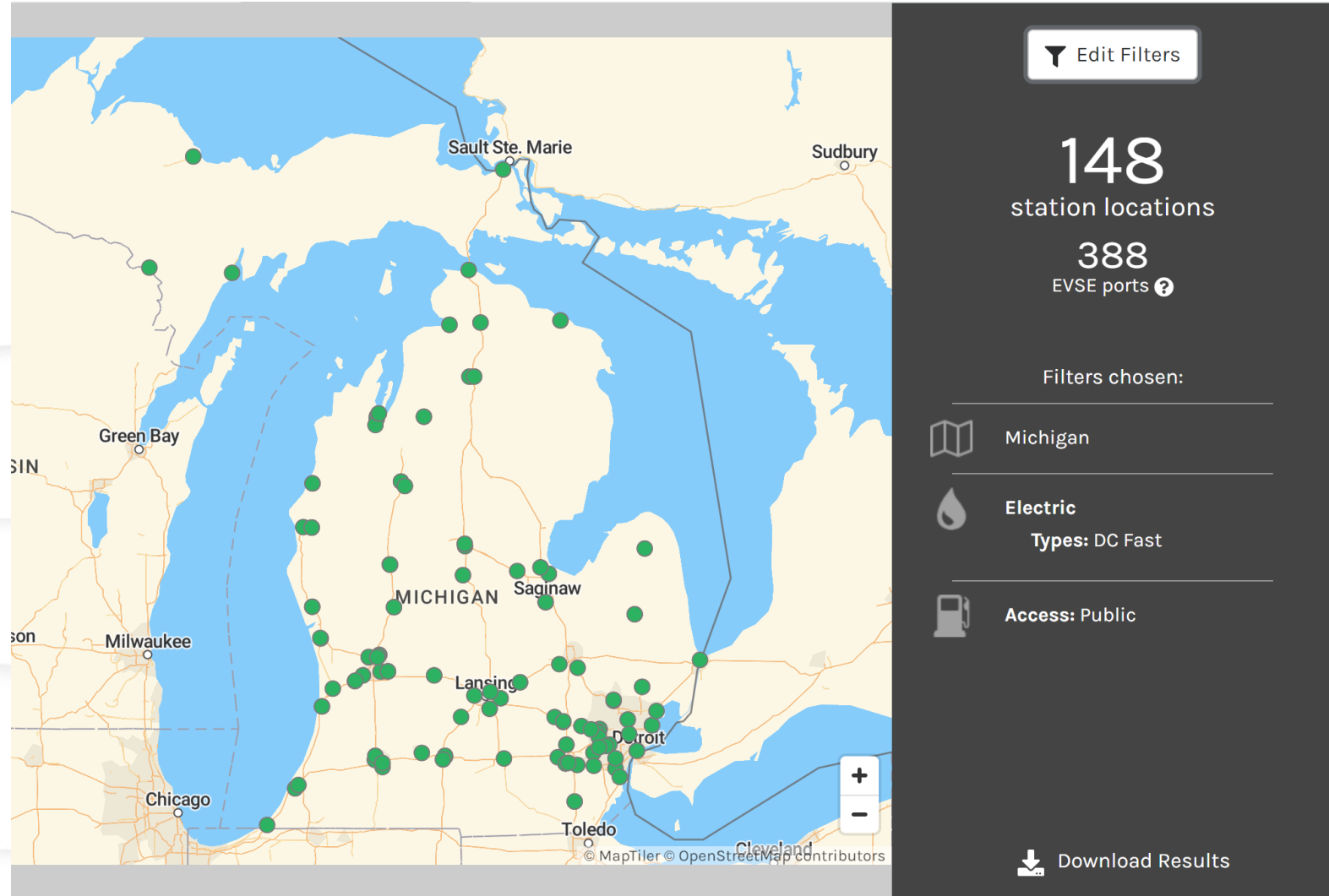
# Public Charging in Michigan

Check out all the locations in Michigan on the [Department of Energy's Alternative Fuel Locator](#)



# DC Fast Charging in Michigan

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# Types of Electric Vehicles

## Hybrid Electric Vehicles

- Powered by an internal combustion engine in combination with one or more electric motors that use energy stored in battery.
- Battery is charged through regenerative braking

## Plug-In Electric Vehicles

- Powered by both diesel or gasoline engine and battery
- Charge through regenerative braking and charging equipment
- Lower level of emissions relative to conventional vehicles

## Battery Electric Vehicles

- Powered by energy from a battery
- Batteries charges by plugging in to power source
- Zero emission vehicles



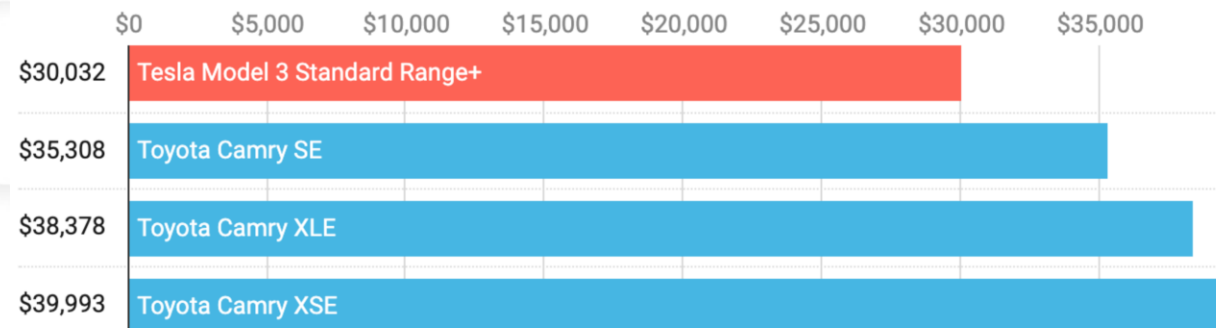


# Financial Savings

- Lower Maintenance Costs
- Reduced Operating Costs
- Energy Efficiency
- Lifespan
- Fuel Costs

## Tesla Model 3 vs. Toyota Camry – 5 Year Cost of Ownership

Analysis: [cleantechnica.com/2019/09/27/tesla-model-3-vs-toyota-camry-5-year-cost-to-own/](https://cleantechnica.com/2019/09/27/tesla-model-3-vs-toyota-camry-5-year-cost-to-own/)



Assumptions: 15,000 miles/year, \$3.10/gallon for gasoline, \$0.13/kWh for electricity, \$1,875 tax credit for Model 3, \$5,000 down payment and 4.5% interest on 5-year loan, Kelley Blue Book estimates for 5-year resale value.

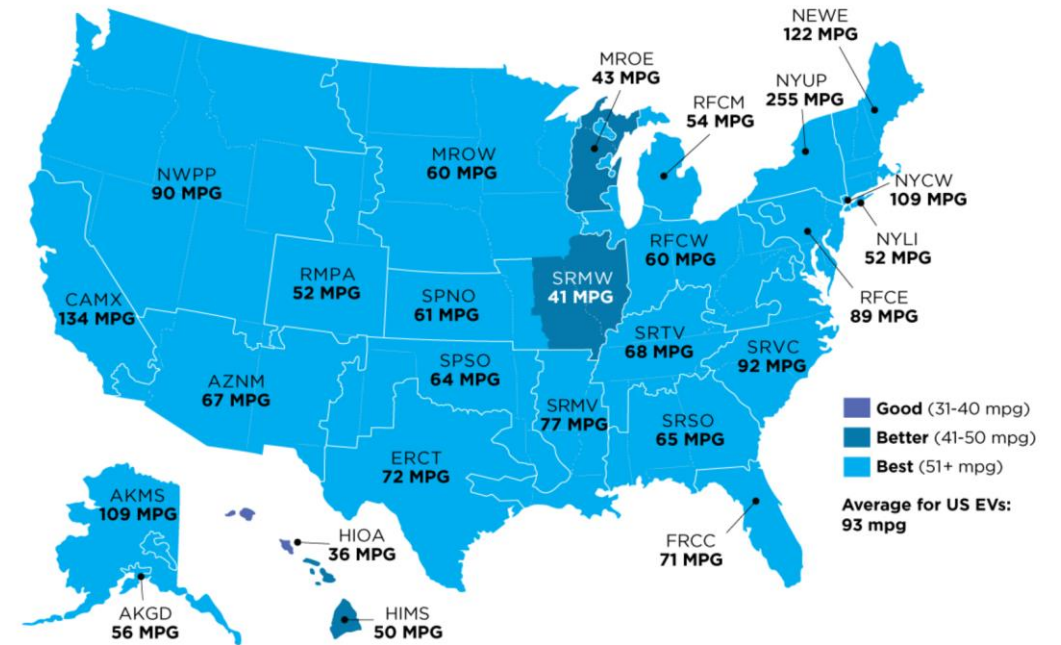
Chart: CleanTechnica



# Environmental Benefits

- No tailpipe emissions
- Lifecycle emissions

## EV Emissions as Gasoline MPG Equivalent Average EV, 2021\*



\* based on 2019 reported electricity generation emissions

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# Where to start?

- Talk to EV owners
- Test drive a vehicle at a local dealership
- Compare an EV to your current car [chooseev.com/savings-calculator/](https://chooseev.com/savings-calculator/)
- See how much you can save on fuel  
<https://electricvehicles.bchydro.com/learn/fuel-savings-calculator>



# Frequently Asked Questions

- What happens to the batteries? What if my battery goes bad?
  - Research for recycling and other uses
  - Warranties
- What options are available today?
  - All shapes and sizes
- Why do people like driving an EVs?
  - Quiet, easier maintenance, environmental benefits
- Are other people in MI driving EVs?
  - EV Driver groups, Michigan EAA, Michigan Tesla Motors Club, West Michigan EV Enthusiasts
- What if my car needs maintenance?
  - There are many maintenance shops that can work with EVs across Michigan



# How to get involved?

- Encourage your local school district to switch to electric school buses
- Encourage your local city fleet to switch to electric vehicles
- Write to state government Senators and Representatives about expanding charging infrastructure



# Connect with Clean Fuels Michigan

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