

# Looking Into Electric Cars

## Session 3 : Charging



## Session 3 : Charging

**Just like there are three levels of chargers, there are categories or goals of charging.**

### **Home Charging**

**Destinations** - at Work, School , Out and about  
chargers that happen to be where you are at.

### **On the Road -**

**Choose a strategy to match your driving.**



## Session 3 : Charging

## Destination

**Disney World now lets you charge your EV faster than you can get through one roller-coaster ride**

Peter Johnson



Disney World is stepping up its efforts to assist the growing population of EV drivers on the road today with new charging solutions that will easily “fill up” your ride quicker than you can get through one roller coaster at the park.

What’s wrong with this picture ?

Last week described the hardware. This week is about where and how. A phrase popped up for charging: “Not Like Pumping Gas” and I thought sometimes it is Like pumping gas.

Both are true.



## Session 3 : Charging

## Destination

**Disney World now lets you charge your EV faster than you can get through one roller-coaster ride**

Peter Johnson



Disney World is stepping up its efforts to assist the growing population of EV drivers on the road today with new charging solutions that will easily “fill up” your ride quicker than you can get through one roller coaster at the park.

That makes for two parallel topics – so first a run through of using the chargers.

What’s wrong with this picture to be explained and discussed later



**Home Charging can be either Level 1 or Level 2**

**It mostly depends on how far you drive**

**And your patience.**

**But remember - -**

**Charging at home is the most convenient all.**





For some people, home charging can be done with a small appliance.

The average driver in the US drives less than 40 miles day.

How far do you drive ?

Federal Highway Administration data from 2019 indicates motorists in the U.S. drive an average of **39 miles per day**. Sep 22, 2021





If you are one of those less than 40 Level 1 might be all that you need.

Just use Level 2 public charging or DCFC when Fast Charging for CCS cars comes to CU

USA TODAY also said the Department of Energy estimates that 81% of charging comes at home, 14% at work and 5% at commercial chargers.



**I only had level 1 at home for two years. It covered all of my in town driving**

**My BMW charges 45 miles in 9 hours. Easily covering my daily drive.**

**My VW charges 35 miles in 9 hours. Covers my daily drive but hinders road trip prep.**

**If you are considering charging with Level 1, find out how fast the car you want will charge.**



**I only had level 1 at home for two years. It covered all of my in town driving**

**If you often drive more than 25 miles everyday, or make frequent trips over 100 miles, you will be happier with a level 2. Or need level 2**

**If you need more than Level 1 and there isn't a 240 outlet in your garage, changes need to be made.**



Ford Mustang Mach-E's supplied charger with interchangeable 120- and 240-volt plugs | Cars.com photo by Joe Wiesenfelder

**Ford realized this and includes a combo charger with the Mach-E**





Mobile connector with 110 and 220 adaptors

**Tesla used to include the “Mobile Connector”**

**It is still available and comes with the standard 110 household plug and has various 240 plugs available.**



# Session 3 : Charging

Home



Either you have room

Or you don't





**Often the biggest expense of a charger is the wiring.**

The least expensive option is an outlet near the panel. Get a charger with 25ft cable and reaching the car is possible without special positioning of the car. Some EVs make it easier than others depending on the placement of the port on the car.



## Session 3 : Charging

**Often the biggest expense of a charger is the wiring.**

With a full panel - options are limited.

Hope for a 240 outlet in the Garage.  
That 240 outlet in the garage can be shared.

Home







A splitter cable depends entirely on the breaker box for safety. I do NOT like these.



SplitVolt - makes one outlet into two. Is auto-switching. About \$299 Not yet UL approved.



NeoCharge - makes one outlet into two. Is auto-switching. About \$499 Elegant design. AND UL approved.



This is the one I got for my home. The full electrical panel photo is my house, house is 60 years old. The updates in 2010 and the solar panels in 2015 left me with nowhere to go.

I bought the \$500 switch so I could share the Dryer outlet with the EV charger. I can start both at the same time, dryer runs first, EV starts when the dryer turns off.

As mentioned earlier the wiring often costs more than the charger. \$500 switch - \$200 charger.

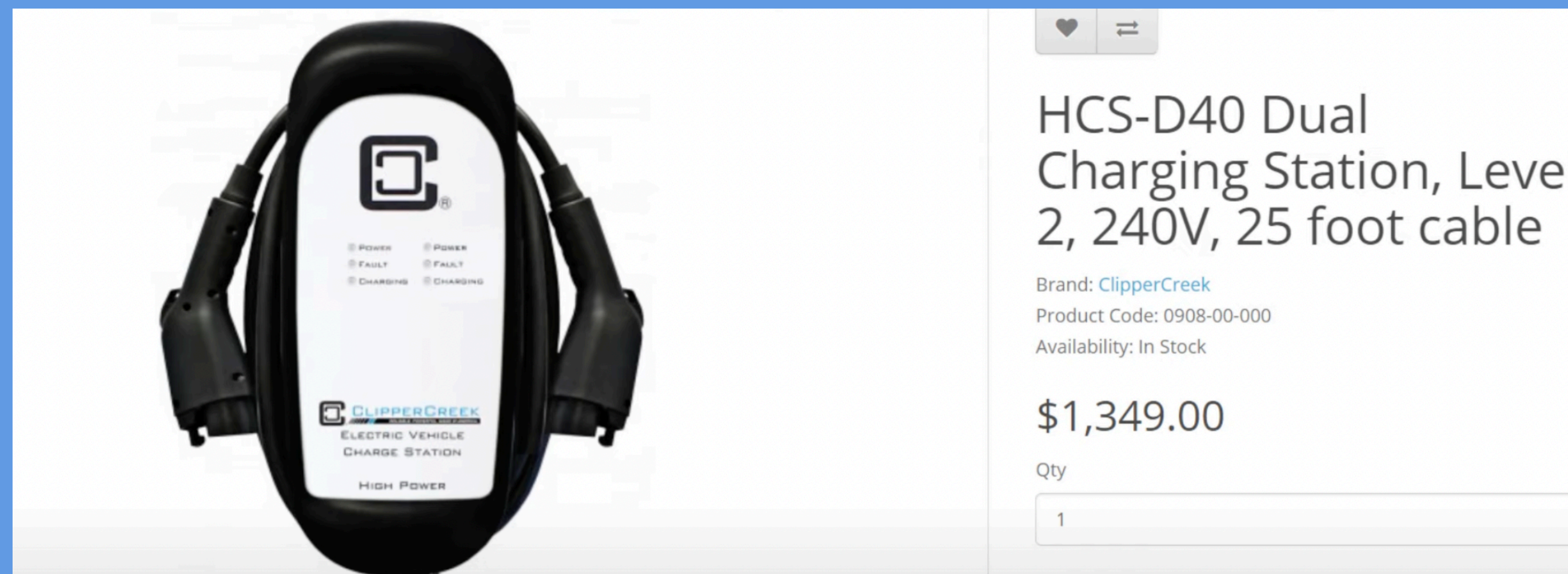
Upgrading service panel would have cost a lot more.



NeoCharge - makes one outlet into two. Is auto-switching. About \$499 Elegant design. Is UL approved.



**With larger traveling distances a 32 amp charger would completely charge almost all current EVs from near empty to 100% in 10 hours. ( adding 75 kWh) People that would want to recommend higher amp chargers are wasting your money. And some EVs might not accept the higher Level 2 charging levels.**





**I do suggest using level 1 at home but I do love my 16 amp level 2**

**The level 2 is handy for prepping the VW for almost weekly road trip.**

**I never use it on BMW, 8 hours on level 1 adds a week of driving.**



When trying to use the network app to start a charge -  
It is often better to turn your phone WIFI off.

Too many apps like Electrify America DON'T REFRESH  
THE DATA - if you had the app running before starting a  
charge, turn it off and back on, to refresh the data.

Sometimes “unavailable” chargers that won't start with the  
app will start by tapping credit card.





Away From home  
there are public  
chargers



Unlike home - you use what  
someone else thought was right  
for the location



## Session 3 : Charging

## Destination



Plug & go



Plug & go  
But ask  
permission



Tap & go



Tap & go  
but better  
with App





Plug & go

This is just outside OLLI on level 3 of the Hill Street Garage. A perk since you paid for parking. Just plug in and almost walk away. Sometimes there is a false start and it fails just as you turn the corner. Public charging etiquette - if your car reaches a charge level where it stops charging. PLEASE - move your car.



## Session 3 : Charging



Plug & go  
But ask  
permission

## Destination

This one is at the iHotel – available for hotel or restaurant customers. They do want you to identify your car and if hotel or restaurant customer. Again - Public charging etiquette - if your car reaches a charge level where it stops charging. PLEASE – move your car.



## Session 3 : Charging

# Destination

Tap & go - Use a tap or contact free credit card. Generally if your'e paying for is, it's OK. The ones I'm referring to here are not networked. They often show up on apps, so they can be found. But the only way of finding out if available is to show up.



Tap & go



## Session 3 : Charging

Better with the app. Showing up and tapping a card works. But with the app often shows availability, some apps allow for reservations ( within hour of showing up ). App with account w/credit card can get you discounts and better receipts, charging progress texts or emails. Etc.

## Destination



Tap & go  
but better  
with App



### **Charging with ChargePoint**

**Using ChargePoint equipment is simple and you can charge with or without the ChargePoint app.**

**ChargePoint is the largest network nationwide and most common networked level 2 in the area. They are also putting in a lot of DCFC chargers. The following slides hopes to show how charging with the app works.**



### Charging with ChargePoint

Using ChargePoint equipment is simple and you can charge with or without the ChargePoint app.

Using ChargePoint equipment is simple and All you need is a contactless credit card (RFID) or phone. There are about 5 ChargePoint locations in the Champaign-Urbana-Savoy area. A few other L2 chargers by other providers show up on the ChargePoint App. you can charge with or without the ChargePoint app.





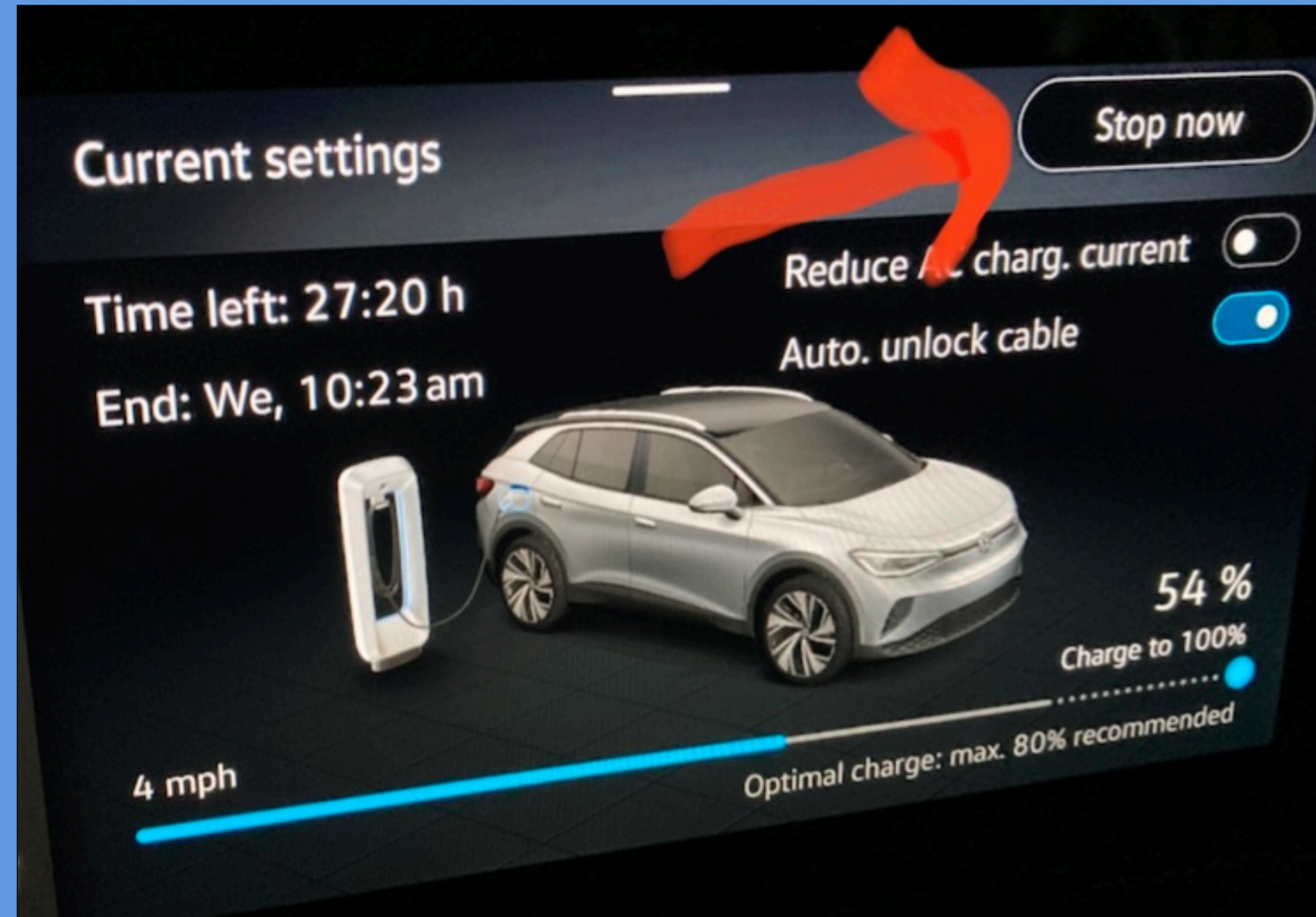


Wave RFID Credit Card or phone with payment app at machine. Plug is locked to post until instructed to plug-in.



## Session 3 : Charging

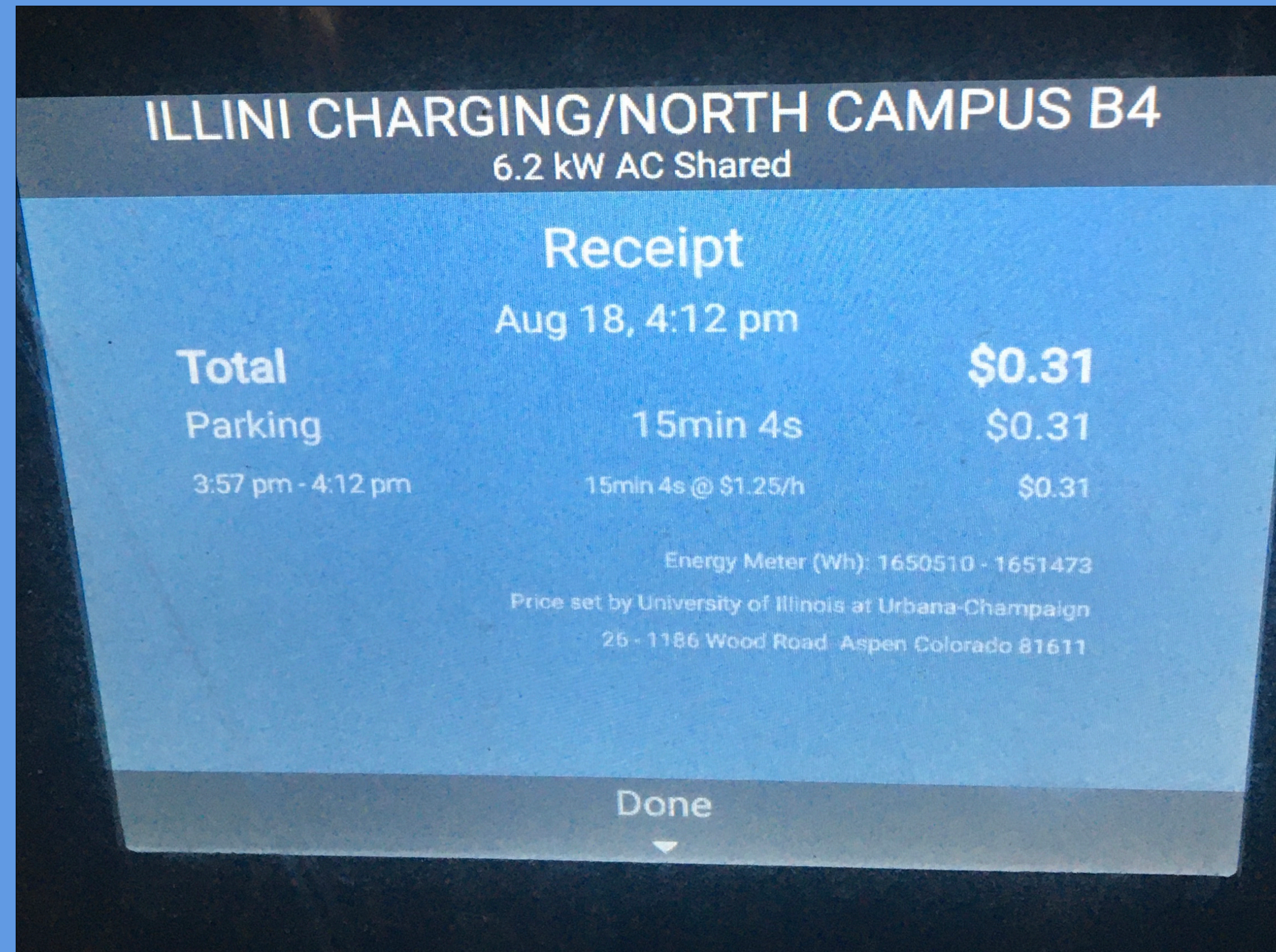
## Level 2



When finished turn off charge from the car or the screen on the post.

If plug doesn't release from car, unlock the car again. Really !! Sometimes a double click.



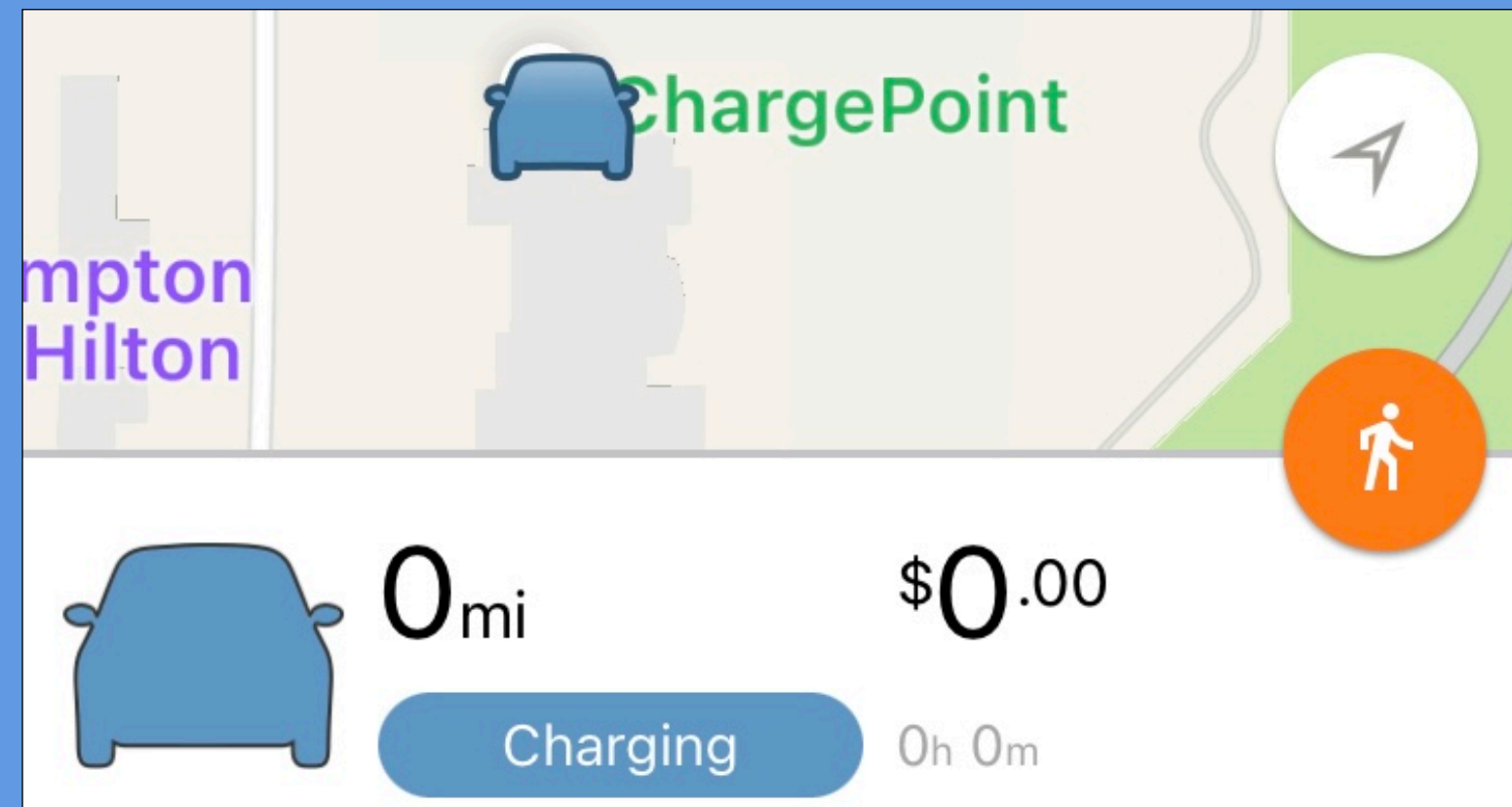


When session is over, receipt shows on the screen

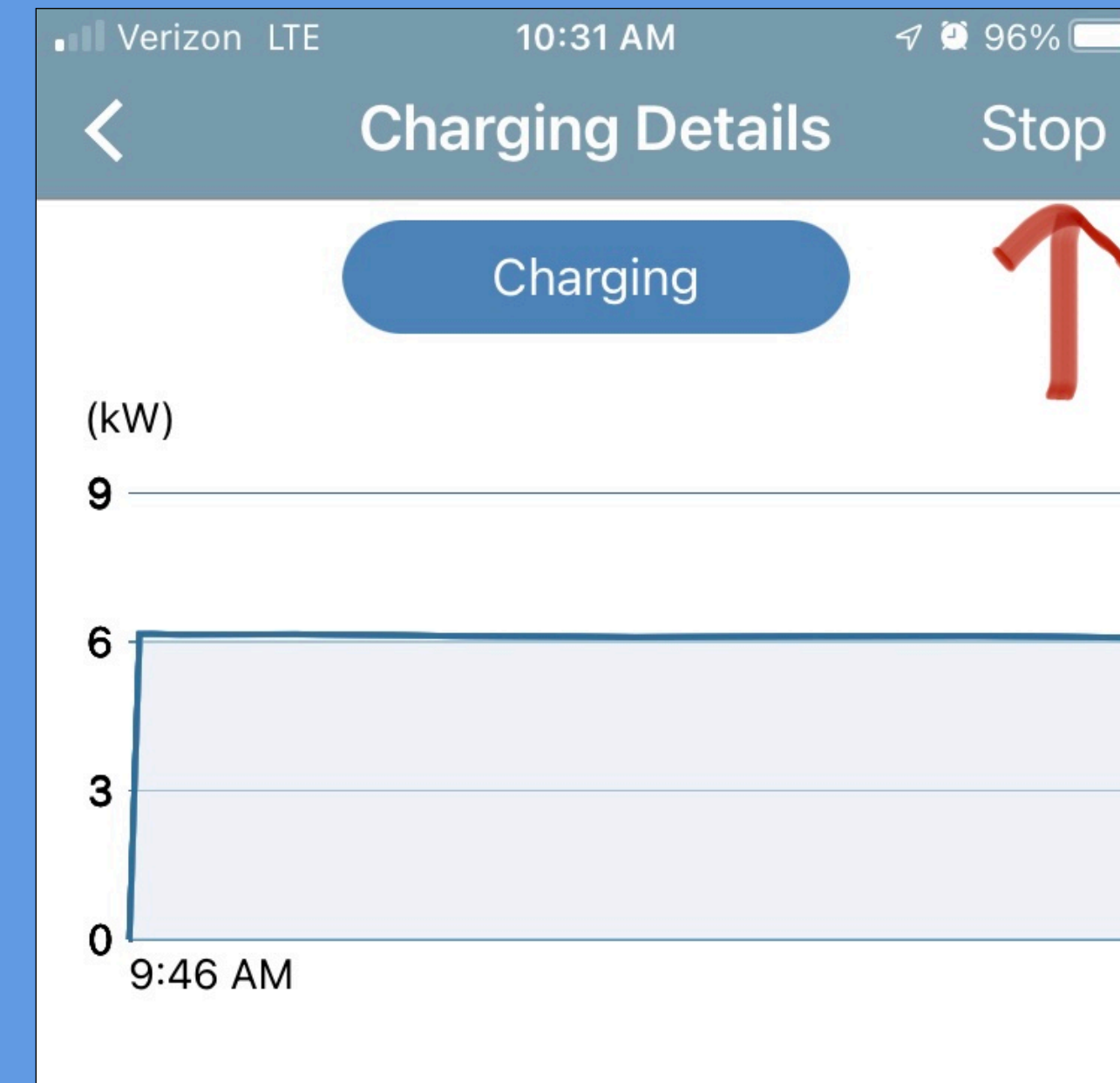


There are benefits when you use the ChargePoint App, more controls and possibly better rates.

Log into App on phone, start the charge from the phone, and plug in when instructed



The Current Session screen pops up on bottom of screen. Tap that and you get more information.



Charging can be stopped from the phone.

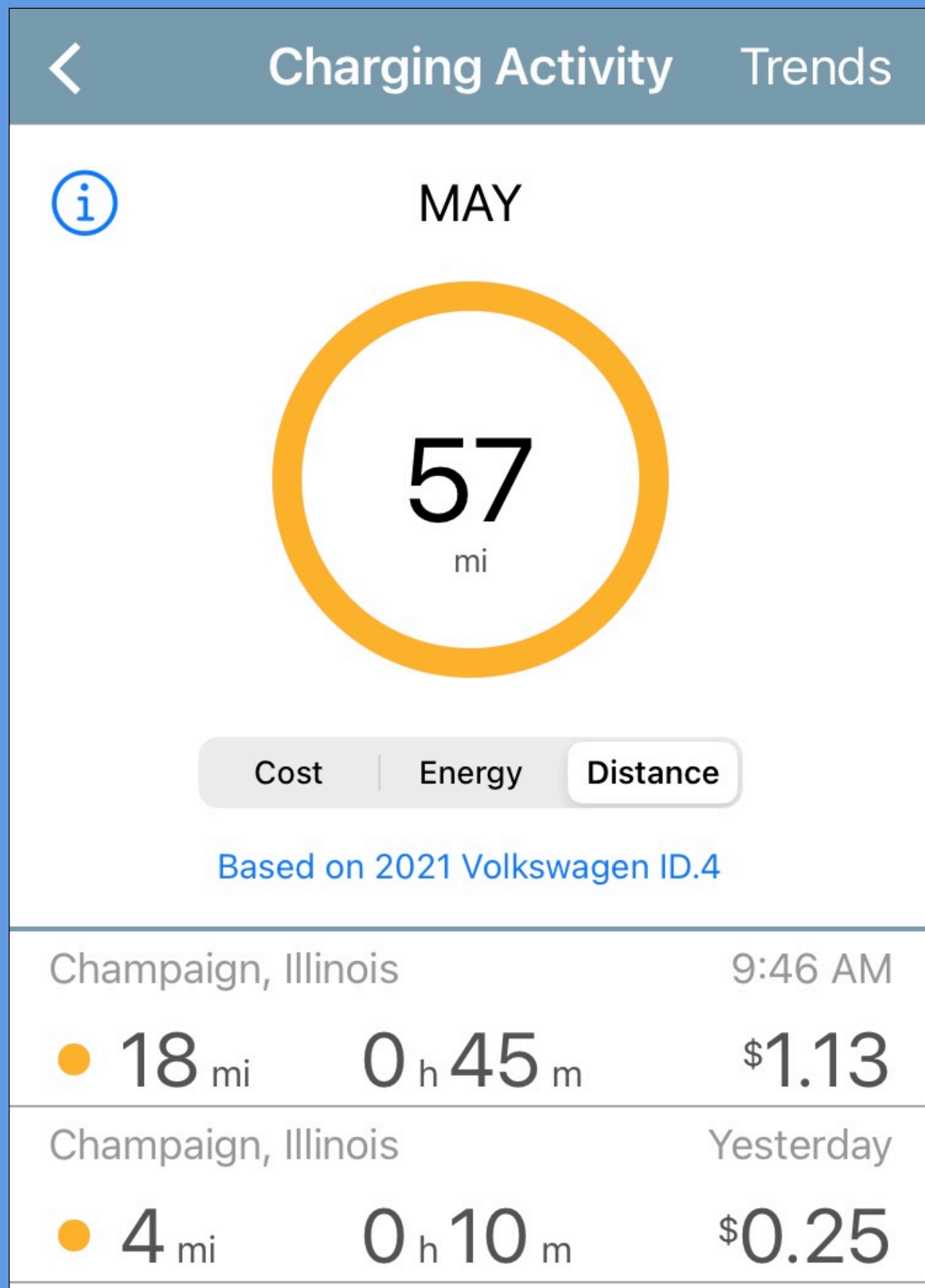


# Session 3 : Charging

## Level 2

The app will show summary of current charge and also has past charging sessions.

A receipt will be emailed.



<b>Station ID:</b> CARLE Champaign FOUNDATION / CATF ADMIN 6.6 kW AC Charging duration: May 17, 2022, 9:46 AM - 10:31 AM	
<b>Energy</b> 4.5323 kWh @ 1.13 \$0.25/kWh 9:46:33 AM - 10:31:51 AM	
<b>Total</b>	<b>\$1.13</b>
Price set by Carle Foundation Hospital	
Transaction started by mobile app	



Here is that information on a PDF.

If you would like this PDF - It is or will be put it on the OLLI download site.

## Charging with ChargePoint

Using ChargePoint equipment is simple and you can charge with or without the ChargePoint app.

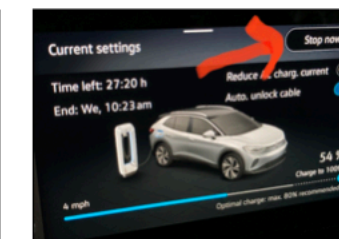


All you need is a contactless credit card (RFID) or phone. There are about 5 ChargePoint locations in the Champaign-Urbana-Savoy area. A few other L2 chargers by other providers show up on the ChargePoint App.

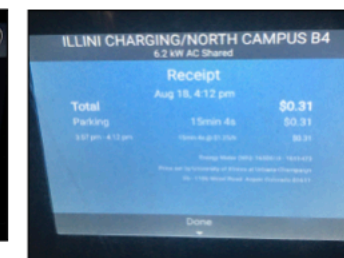
Wave RFID CC or phone at machine. Plug in when instructed.



When finished turn off charge from the car.



When session is over, receipt shows on the screen

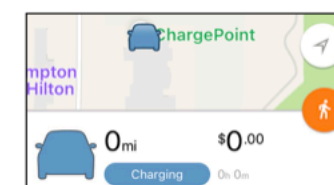


If plug doesn't release from car, unlock the car again. Really !!

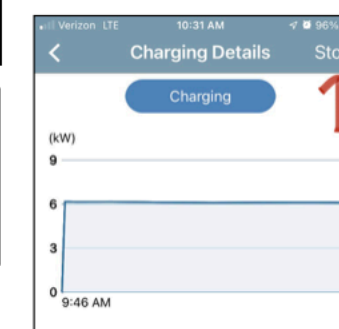


It is better when you use the ChargePoint App, more controls and possibly better rates. Log into App on phone, use phone to start charger and plug in when instructed.

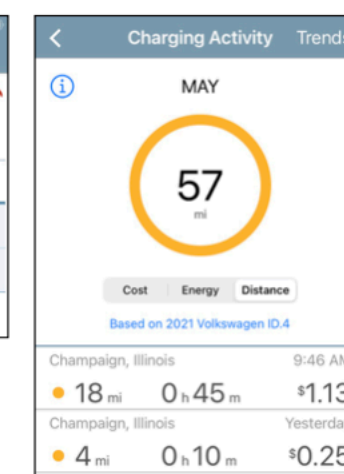
The Current Session screen pops up on bottom of screen. Tap that and you get more information.



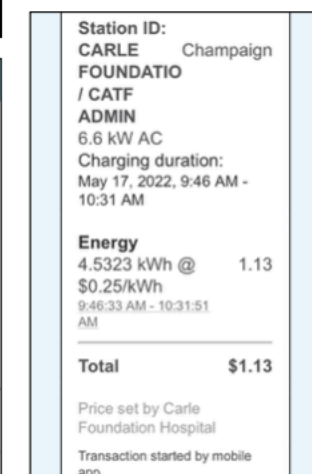
Charging can be stopped from the phone.



You can find summaries of all your sessions on the app.



A receipt will be emailed.



2022-05-25



# Session 3 : Charging

## DC Fast Charging

The two largest networks with good national coverage are Tesla and Electrify America.





## Session 3 : Charging

Since Electric America is what I use most, I will run through using their chargers. Using the equipment is simple and charging can be started with or without the app. You can charge with a credit card but by using the app you will get better rates. Current rates are \$.43 per kWh. The app automatically applies the discount. First find the station on the app,

### DC Fast Charging

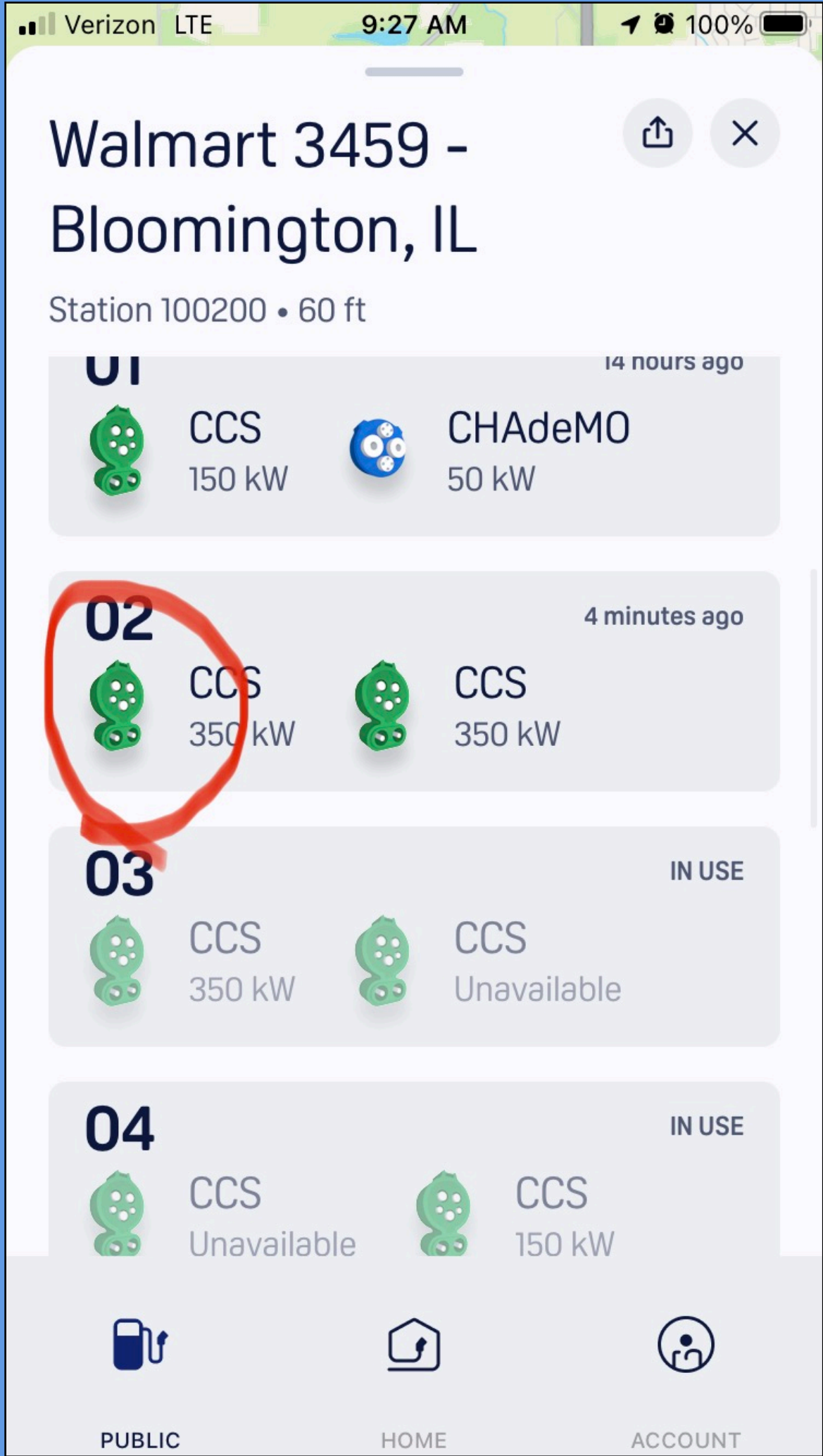




# Session 3 : Charging

## DC Fast Charging

Look for charger number at top of charger. Select charger by tapping on the app.

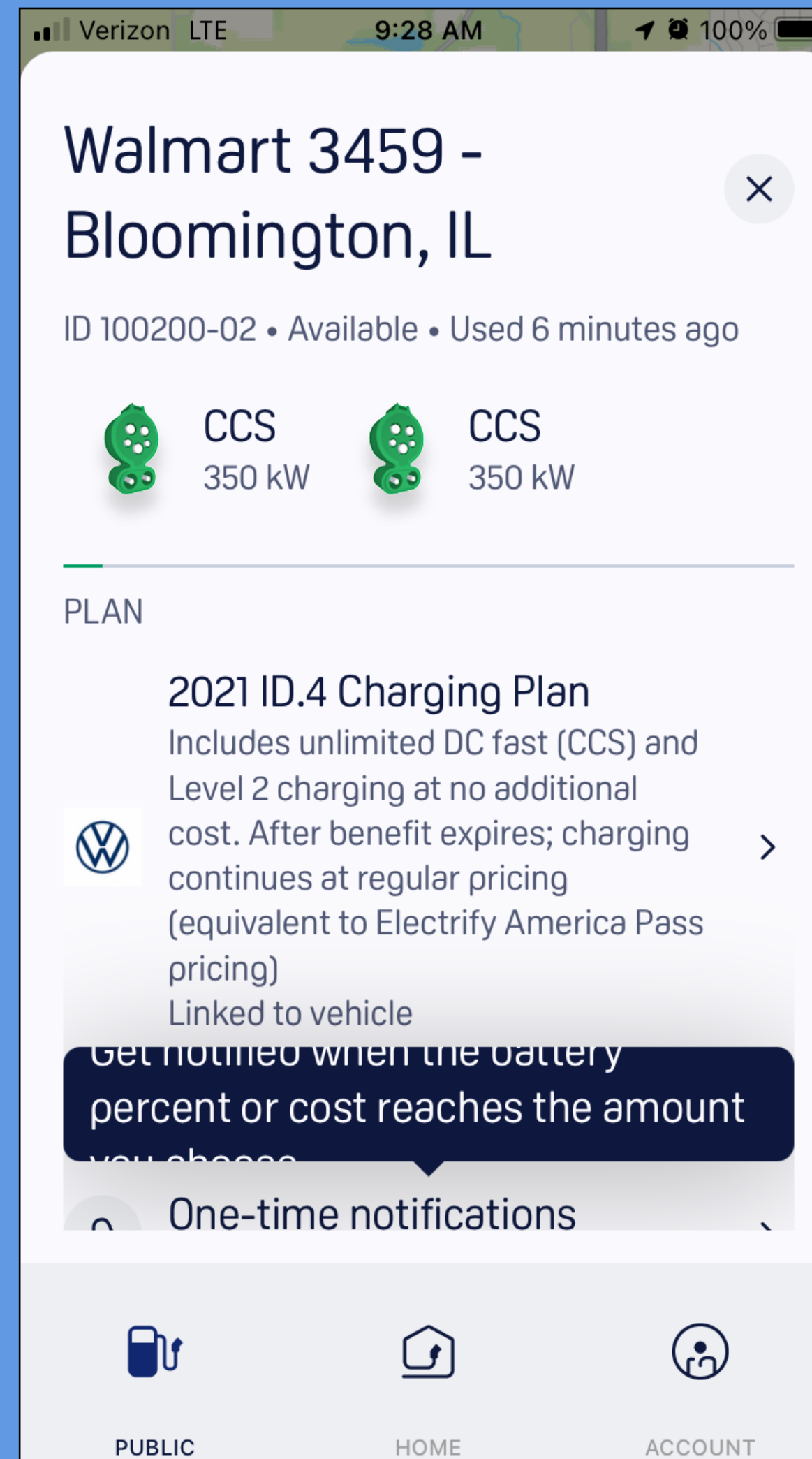




# Session 3 : Charging

If you have a charging plan it will show up on the EA app.

## DC Fast Charging

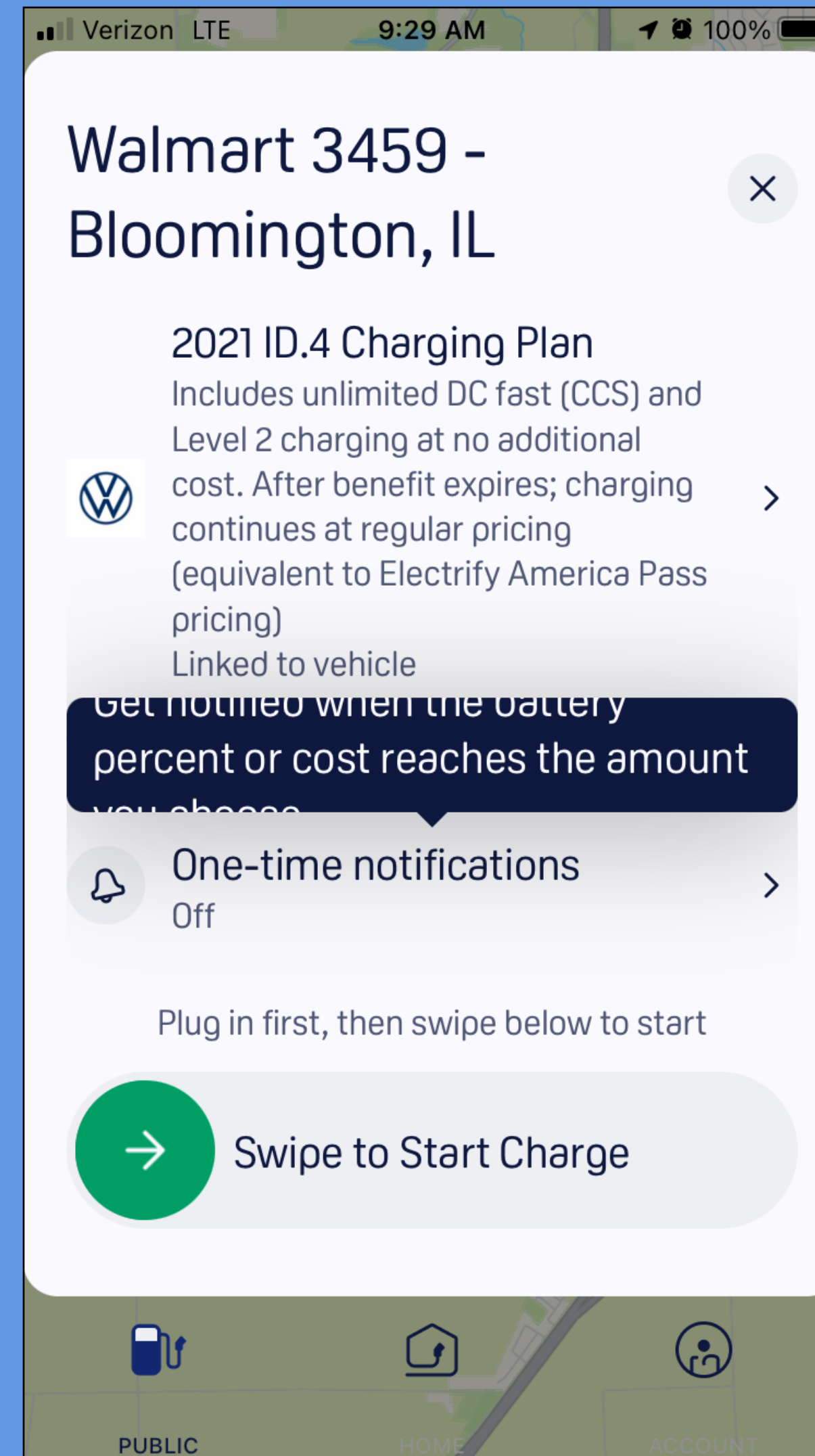




# Session 3 : Charging

Go to bottom of that page on app and swipe to start. Green arrow shows the direction.

## DC Fast Charging

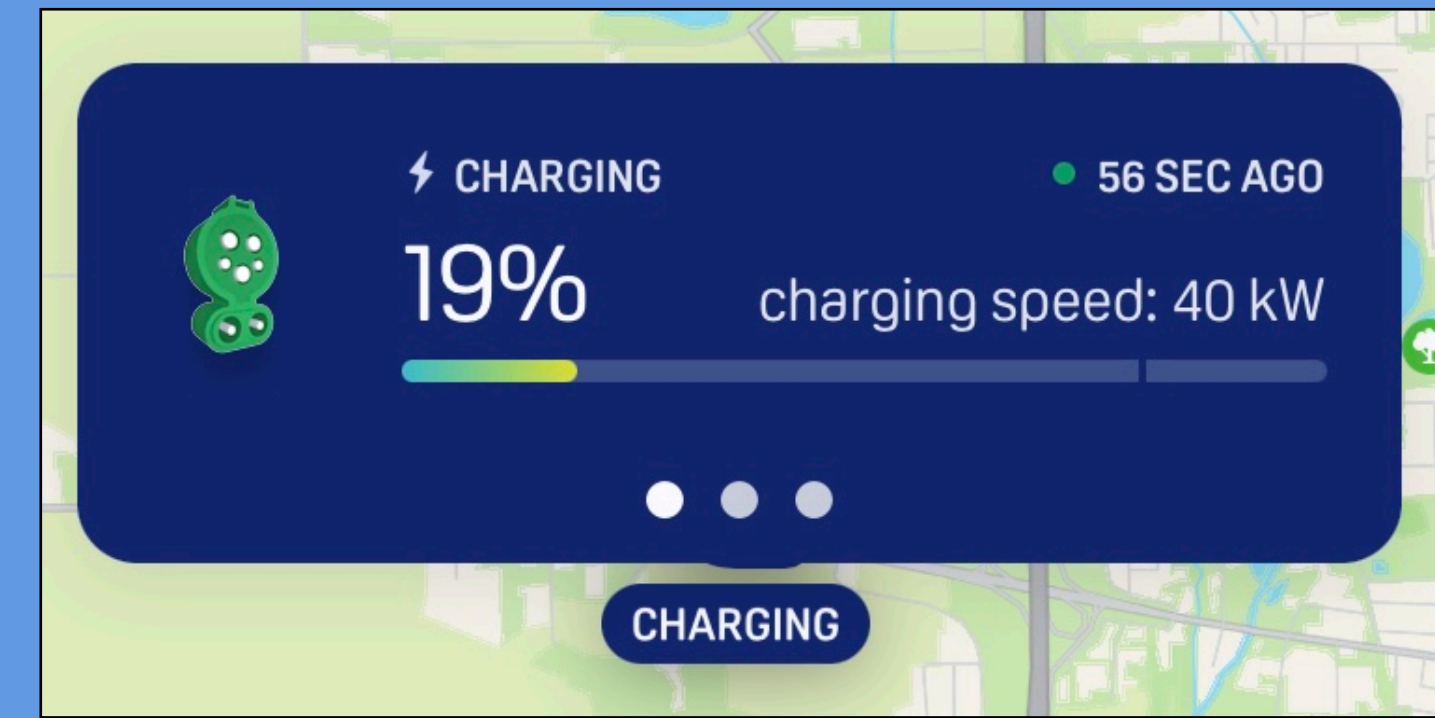
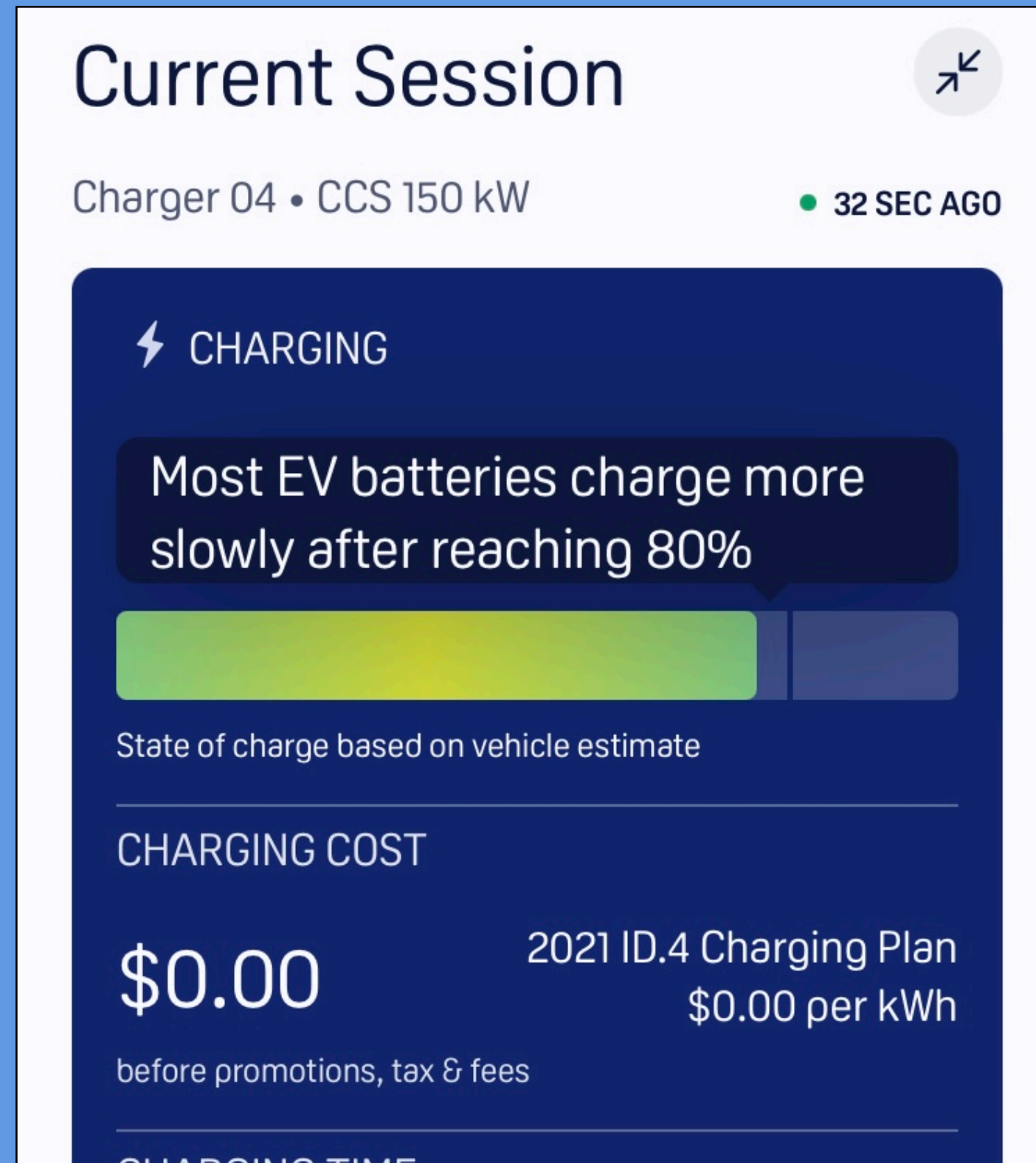




# Session 3 : Charging

## DC Fast Charging

The Current Session screen pops up when charging starts. Status of the session is updated in the app. To see different screens, swipe left or right.





# Session 3 : Charging

## DC Fast Charging

Stop charging on the charger or the panel in the car. If plug is locked, unlock the car. Just like unlocking the doors.





## Session 3 : Charging

### DC Fast Charging

If plug is locked to the car, unlock the car. Just like unlocking the doors.

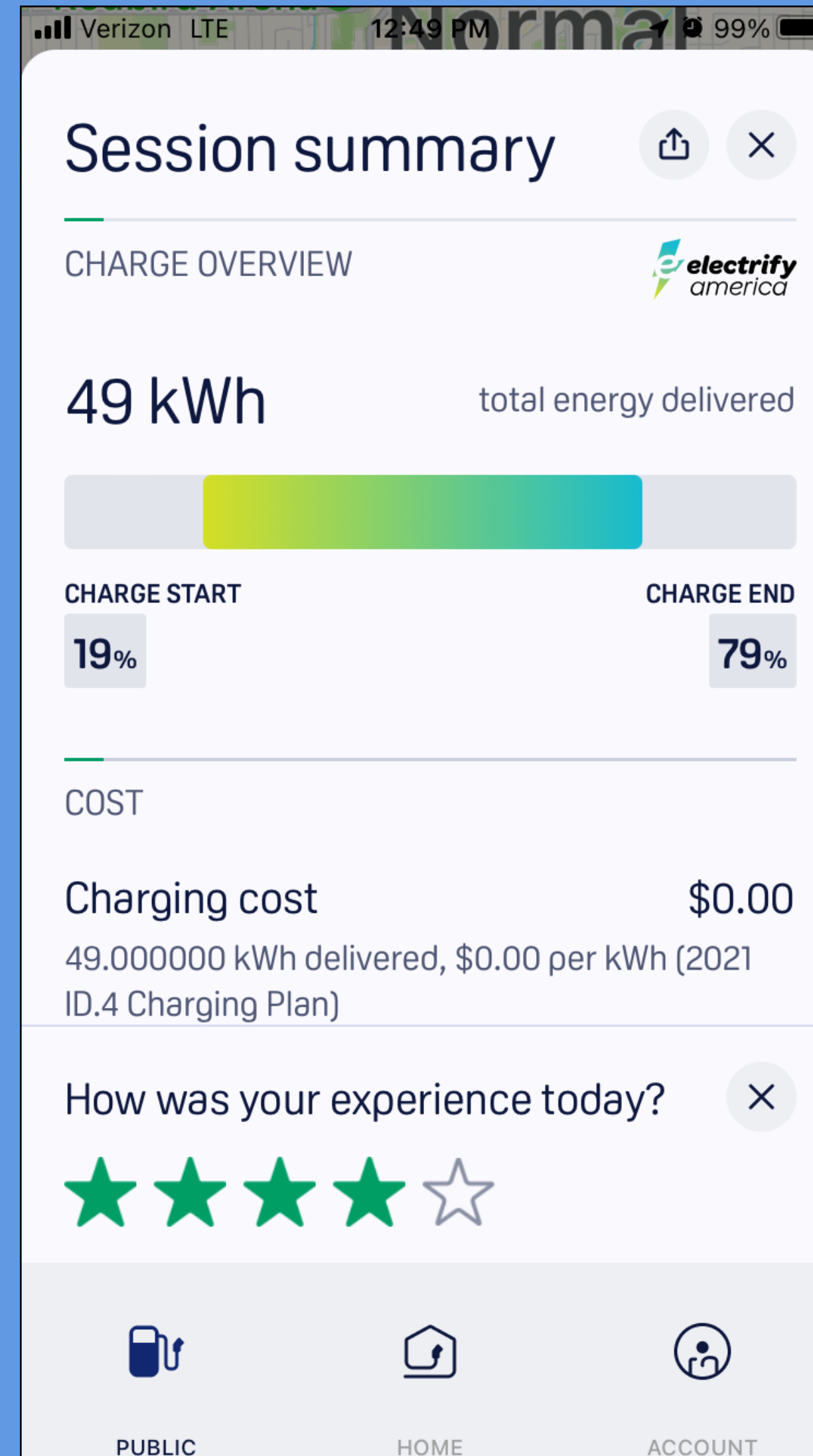
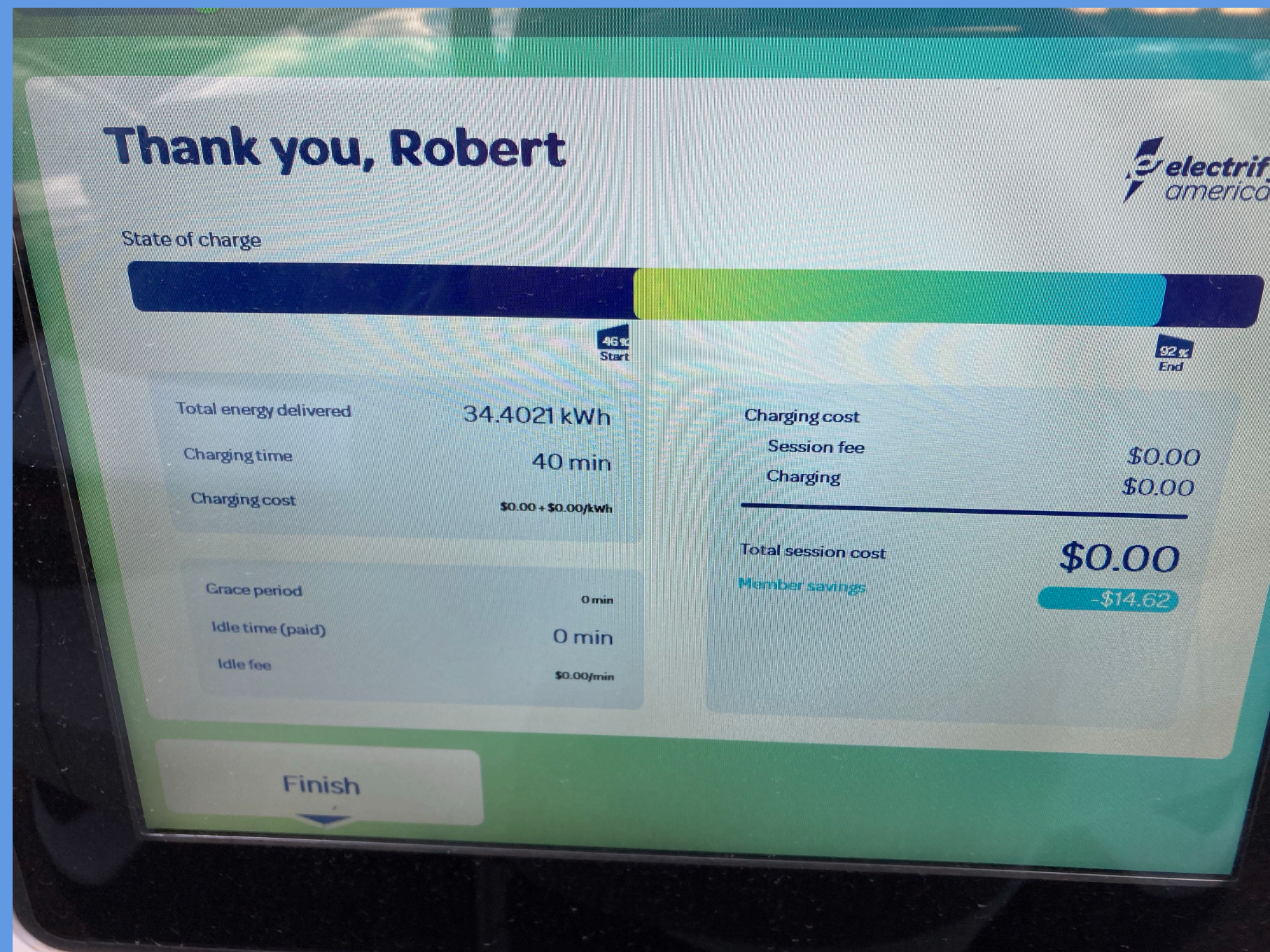




# Session 3 : Charging

# DCFC - (Level 3)

After you're done you will get a session summary. On screen, in the app and in an email.





Here is that information on a PDF.

If you would like this PDF - It is or will be put it on the OLLI download site.

## Charging at Electrify America

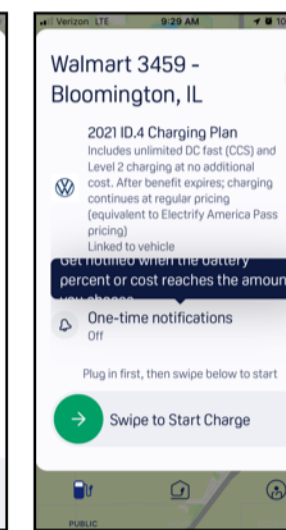
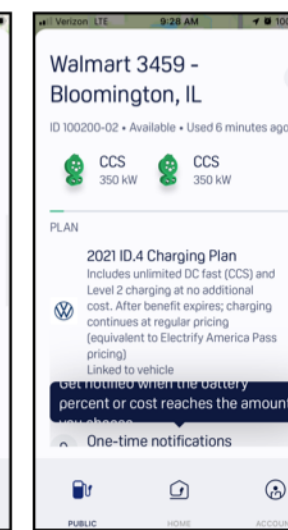
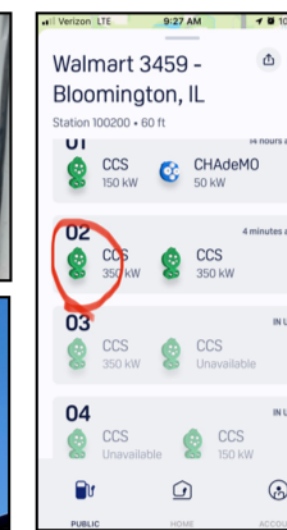
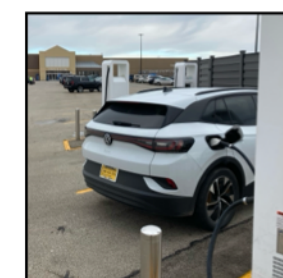
You can charge with credit card but by using the app you will get better rates. As the charger says, Plug-in first, find station on the app look for charger number at top of charger.

EA is the largest public Direct Current Fast Charging network for non Tesla EVs. DCFC makes cross country trips with EVs possible. Log onto the charger with either a RFID credit card or using the EA app. With a credit card login - follow instructions on the screen

Select charger by tapping on the app.

If you have a charging plan it will show up on the EA app.

Go to bottom of that page on app and swipe to start.

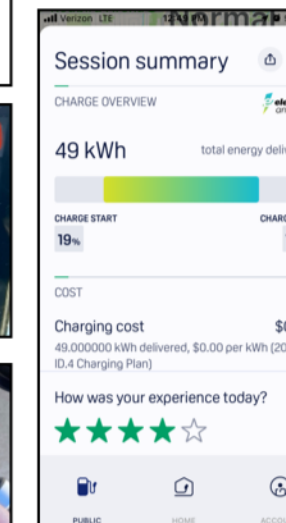
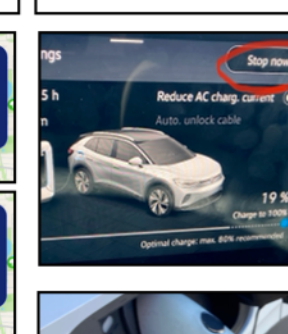
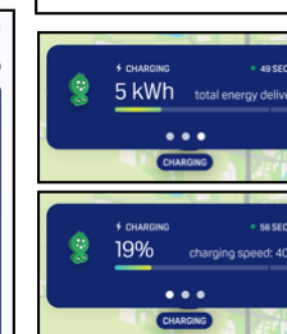
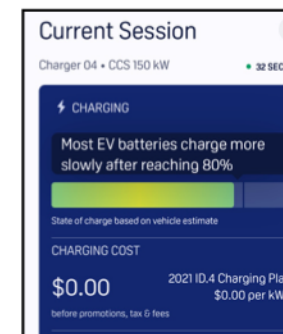


The Current Session screen pops up when charging starts.

Status of the session is updated in the app. To see different screens, swipe left or right.

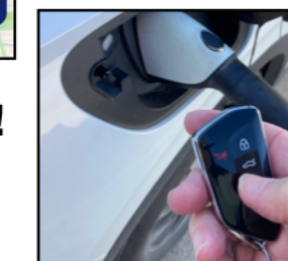
Stop charging on the charger or the panel in the car. If plug is locked, unlock the car

After you're done you will get a session summary.



### Bonus !!!

When planning a trip you can check on the App and find out if any of the locations you want to use are having maintenance done. Sometimes an "unavailable" charger can be started by inserting chip credit card.



2022-06-15



## Session 3 : Charging



Interesting road trip video - this driver is a little braver pushing the range limits than I would. Video shows good attitude for convenience charging and dealing with charging glitches that pop up. (32 minutes)



## Session 3 : Charging

## Talking Points

**Disney World now lets you charge your EV faster than you can get through one roller-coaster ride**

Peter Johnson



Disney World is stepping up its efforts to assist the growing population of EV drivers on the road today with new charging solutions that will easily “fill up” your ride quicker than you can get through one roller coaster at the park.

# What’s wrong with this picture ?

The charging speed doesn’t match the venue. 20 minute chargers for a 2 hour destination. And high speed chargers have a fee for not moving car when no longer charging. The fast chargers are more suitable for a 10 minute Starbucks stop or 25 minute grocery trip. Disney might be better served by having 20 level 2 chargers and conveniently served the same number of EV drivers . (probably would have a similar installation cost)



## Session 3 : Charging



## Talking Points

**Inductive (commonly Wireless) charges is apparently cost effective for buses, keeping them on the route longer.**

**Also some possibilities at taxi stands.**





Inductive (commonly Wireless) charging for cars at home. Costly installation. And you need to modify your car. (Warrantee issue?) No current EVs have this option. I was surprised that energy loss is about the same as plugin charging.





**Inductive (commonly Wireless) charging for highways. A nice idea but maintaining roads is already costly and time consuming without this.**



# Session 3 : Charging

The end for now.



# Session 3 : Charging

The end for now.



# Session 3 : Charging

The end for now.



# Looking back

Zits By Jerry Scott and Jim Borgman





Looking back



Cost increases and cost savings with Electric.



## Looking back



Except for the US postal service. At one time the largest private fleet of vehicles ( now second ) The federal Government is offering money to cover the cost of buying EVs to convert fleet to as close to 100% electric as possible. The little trucks that drive past my house are estimated to save \$8000 per year per vehicle.



Looking back

# Energy



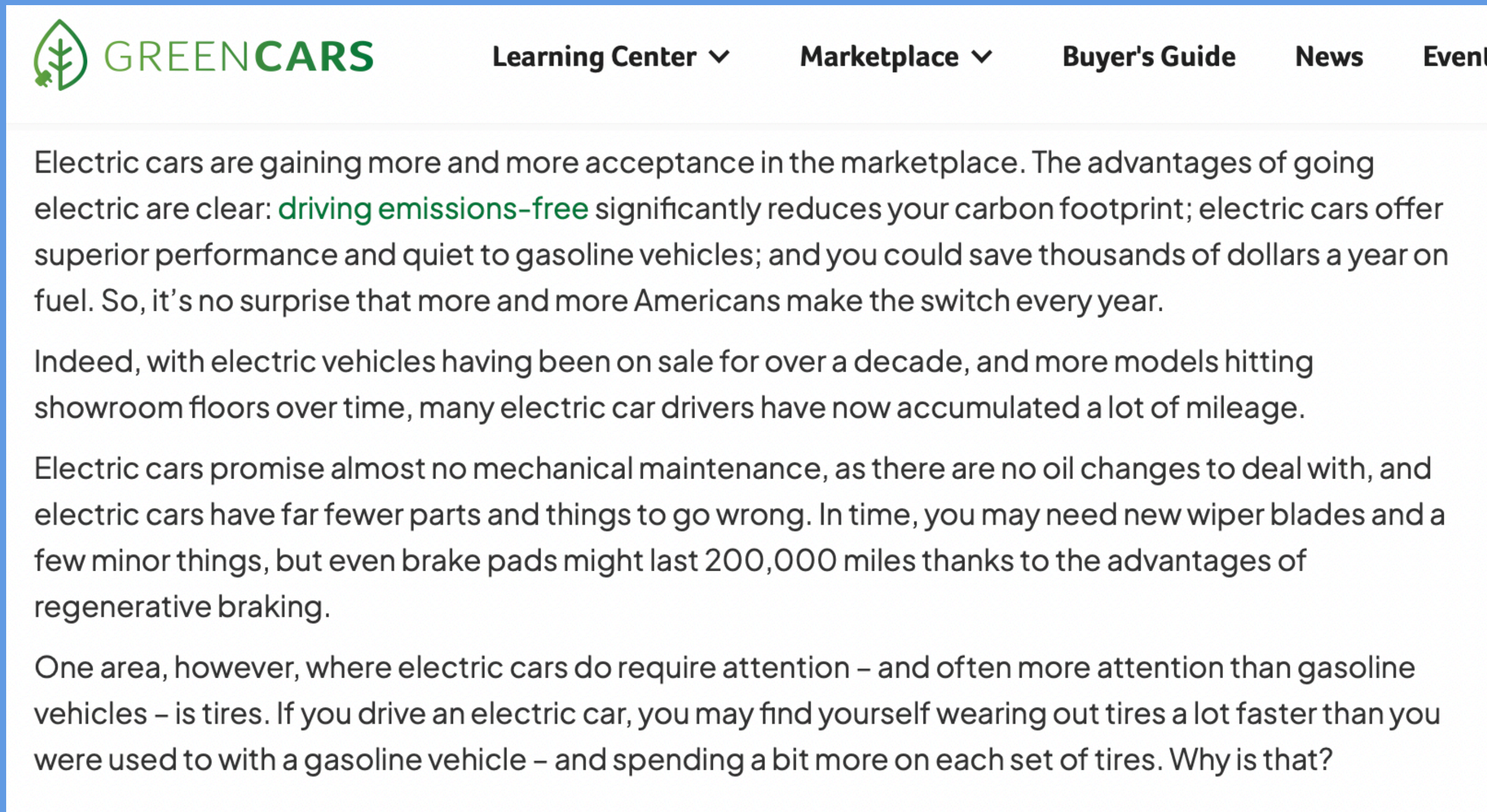
Hard to give a dollar amount on this. Each post office vehicle will save more than a vehicle for personal use. Maybe if someone drives very far everyday for work.

I will guess a good ballpark estimate is that every mile driven will save 10 cents. To get a total for the year, a number for yearly mileage is needed. For the last year of my gasoline Subaru - 6000 miles or \$600. But I've driven my VW ID4 twice that far this year.



## Looking back

## Maintenance



The screenshot shows the top navigation bar of the GreenCars website with links for Learning Center, Marketplace, Buyer's Guide, News, and Events. The main content area contains three paragraphs of text discussing the benefits and maintenance of electric vehicles.

Electric cars are gaining more and more acceptance in the marketplace. The advantages of going electric are clear: **driving emissions-free** significantly reduces your carbon footprint; electric cars offer superior performance and quiet to gasoline vehicles; and you could save thousands of dollars a year on fuel. So, it's no surprise that more and more Americans make the switch every year.

Indeed, with electric vehicles having been on sale for over a decade, and more models hitting showroom floors over time, many electric car drivers have now accumulated a lot of mileage.

Electric cars promise almost no mechanical maintenance, as there are no oil changes to deal with, and electric cars have far fewer parts and things to go wrong. In time, you may need new wiper blades and a few minor things, but even brake pads might last 200,000 miles thanks to the advantages of regenerative braking.

One area, however, where electric cars do require attention – and often more attention than gasoline vehicles – is tires. If you drive an electric car, you may find yourself wearing out tires a lot faster than you were used to with a gasoline vehicle – and spending a bit more on each set of tires. Why is that?

Few people want to go out on a limb and say no maintenance. But I have never taken my 30 year old electric drill in for maintenance. There will be some things that need it.

First up will be fluid changes in the mechanical brakes every 3 years. After that I can't remember anything I needed for the Subaru that the EV will need.

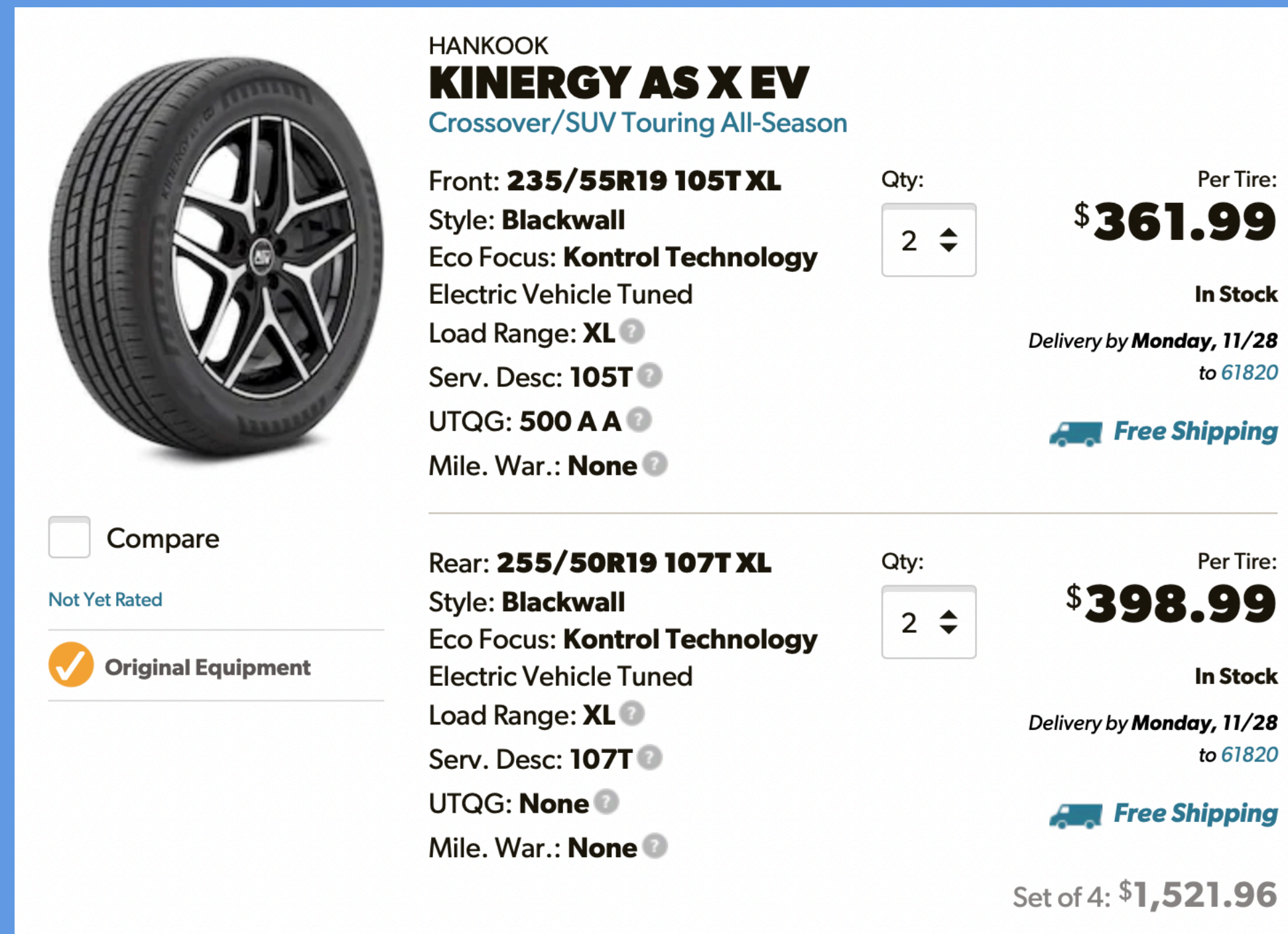


## Looking back

# Tires

OUCH!!!

Tires are the big one. I haven't purchased tires in a while, but it looks like twice as much. Remember - These are TRUCK tires. With the EV battery the gross vehicle weight of the cars are high and need almost truck sturdy tires. Also non-EV tires are available cost less upfront. EV tires will get better range and cost less over time.



**HANKOOK**  
**KINERGY AS X EV**  
Crossover/SUV Touring All-Season

Front: **235/55R19 105T XL** Qty: 2 Per Tire: **\$361.99**  
Style: **Blackwall**  
Eco Focus: **Kontrol Technology**  
Electric Vehicle Tuned  
Load Range: **XL**  
Serv. Desc: **105T**  
UTQG: **500 A A**  
Mile. War.: **None**  
In Stock  
Delivery by **Monday, 11/28** to 61820  
Free Shipping

Compare  
Not Yet Rated  
Original Equipment

Rear: **255/50R19 107T XL** Qty: 2 Per Tire: **\$398.99**  
Style: **Blackwall**  
Eco Focus: **Kontrol Technology**  
Electric Vehicle Tuned  
Load Range: **XL**  
Serv. Desc: **107T**  
UTQG: **None**  
Mile. War.: **None**  
In Stock  
Delivery by **Monday, 11/28** to 61820  
Free Shipping

Set of 4: **\$1,521.96**

TireRack website - (I buy all my tires there)

Its possible that a lot of EVs will be like mine and not have tire rotation.

The illustration is for my tires and note different sizes, front and back.



# Looking back

# Registration



### Affirmation for Electric Vehicle

Definition (625 ILCS 5/12-805): Beginning on January 1, 2020, the registration fee for Electric vehicles shall be equal to the fee set forth in Section 3-806 for motor vehicles of the first division, other than Autocycles, Motorcycles, Motor Driven Cycles, and Pedacycles. In addition to the registration fees, the Secretary shall assess an additional \$100 per year in lieu of the payment of motor fuel taxes. \$1 of the additional fees shall be deposited into the Secretary of State Special Services Fund and the remainder of the additional fees shall be deposited into the Road Fund. (Source: P.A. 101-32, eff. 6-28-19.)

### Fees

#### Random-Number Electric Vehicle License Plates

- Newly acquired vehicle/first-time issuance - \$406 (\$155 title fee + \$251 registration fee)
- Currently titled vehicle/first-time issuance - \$251 (\$251 registration fee)
- Current plates expire within 90 days - \$280 (\$251 registration fee + \$29 replacement fee)
- Current plates do not expire within 90 days - \$280 (\$251 registration fee + \$29 replacement fee)
- Annual renewal - \$251

Passenger vehicle plates in Illinois cost \$100 more to offset the motor vehicle fuel tax that they do not pay.

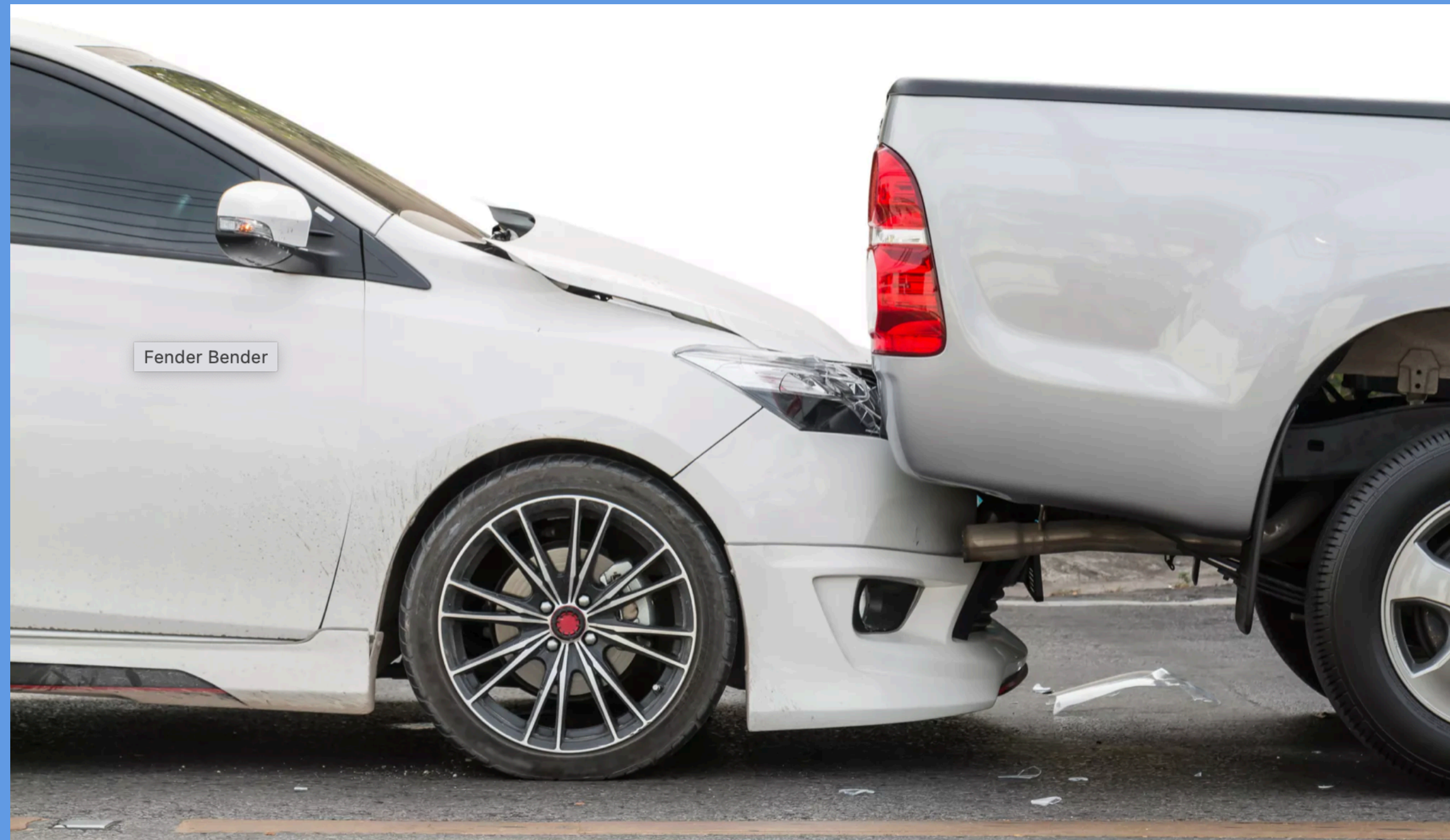
Passenger	\$151
Passenger Personalized	\$158
Passenger Vanity	\$164
Persons with Disabilities	\$151
Persons with Disabilities Personalized	\$158

Illinois Sec. Of State website



Looking back

Insurance



Expect car insurance to start a little higher. For a lot of insurance companies, the actual payouts for losses is an unknown, I expect that to go down as more EV drivers are cautious and the percentage of Tesla (Plaid version ) street racers diminishes.



**The end for now.**



# CHAdeMO

CHAdeMO :



CHAdeMO is a fast-charging system for battery electric vehicles, developed starting in 2010 by the CHAdeMO Association, formed by the Tokyo Electric Power Company and five major Japanese

Wikipedia



I neglected the CHAdeMO connector last week. Still in use, very few cars, future support uncertain.





# CHAdEMO

CHAdEMO :



CHAdEMO is a fast-charging system for battery electric vehicles, developed starting in 2010 by the CHAdEMO Association, formed by the Tokyo Electric Power Company and five major Japanese

Wikipedia

Electrify America will phase out at end of this year.

Nissan : Newer Leaf models will continue with CHAdEMO but the new Ariya will be Tesla and not CHAdEMO.

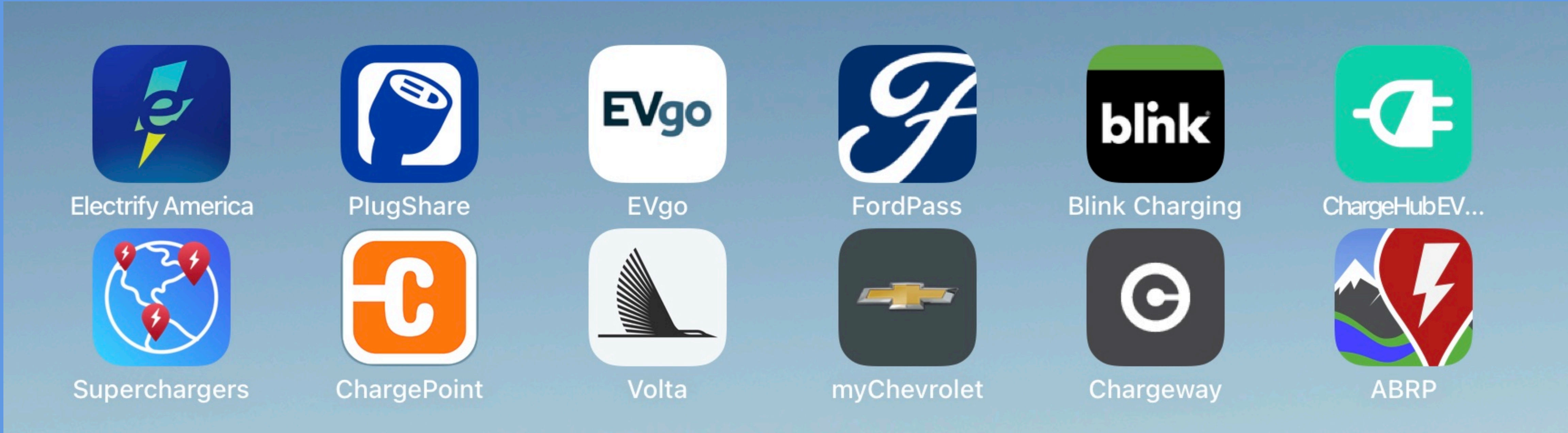
There a couple other EVs around that have CHAdEMO, mostly older models with short range and rarely use DC charging.



**The end for now.**

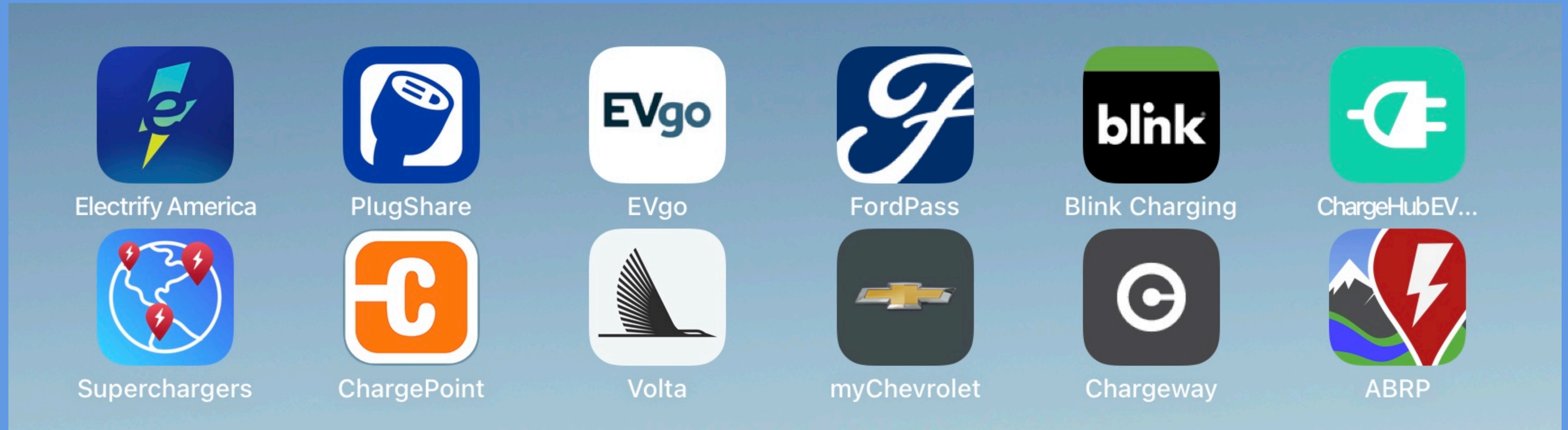


# Session ??: Charger Apps





## Session ??: Charger Apps



There are a lot of apps for charging networks - some actually are charging networks - one in particular - is pretty good at finding chargers regardless of network. Some even claim to be a networks but are really just a list of chargers.



## Session ??: Charger Apps



Starting with the ones that I find  
most useful.

Electrify America

Superchargers

PlugShare

ChargePoint



# Session ??: Charger Apps



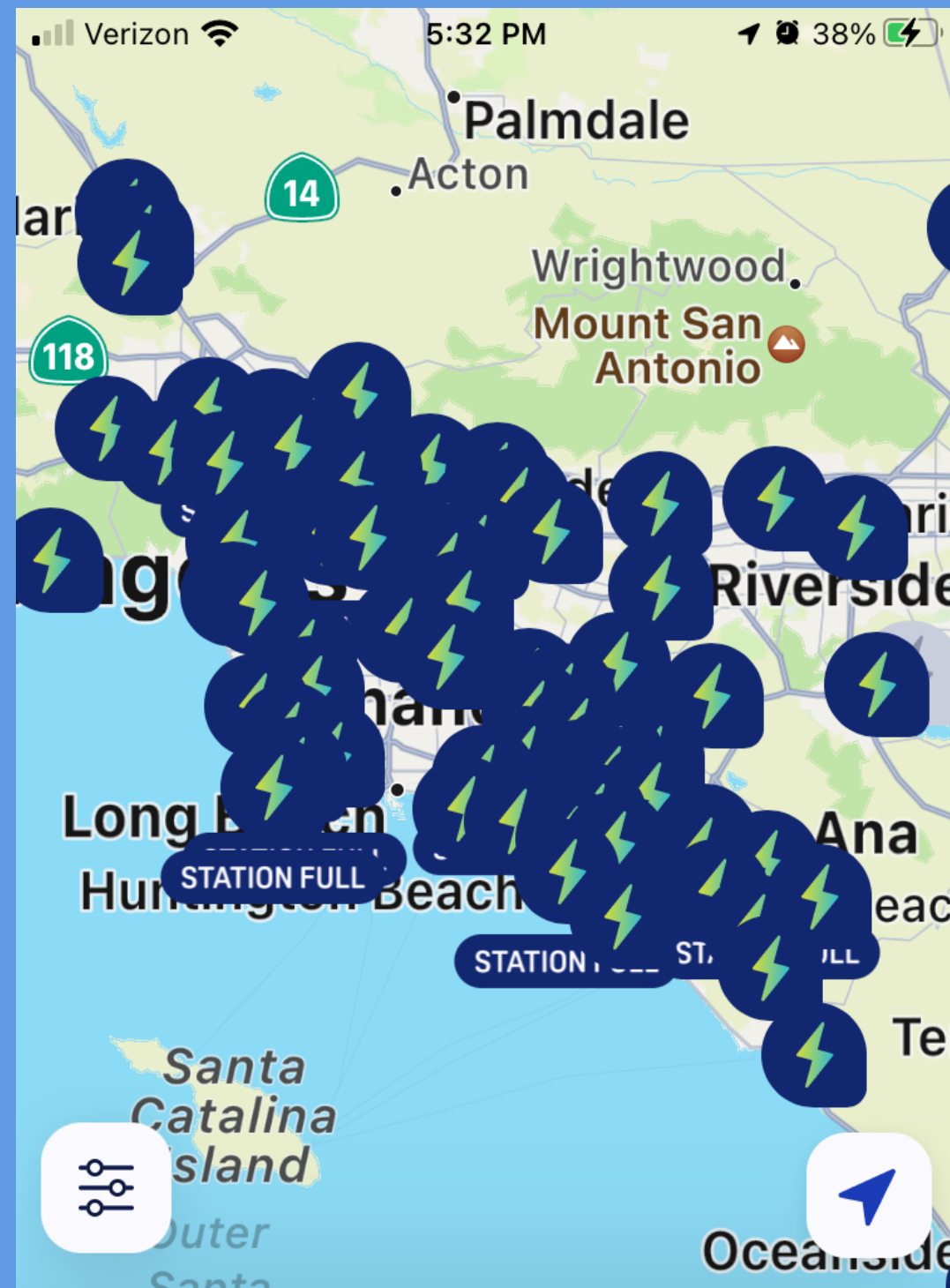
The Electrify America charging network. Showing every location - looks pretty.



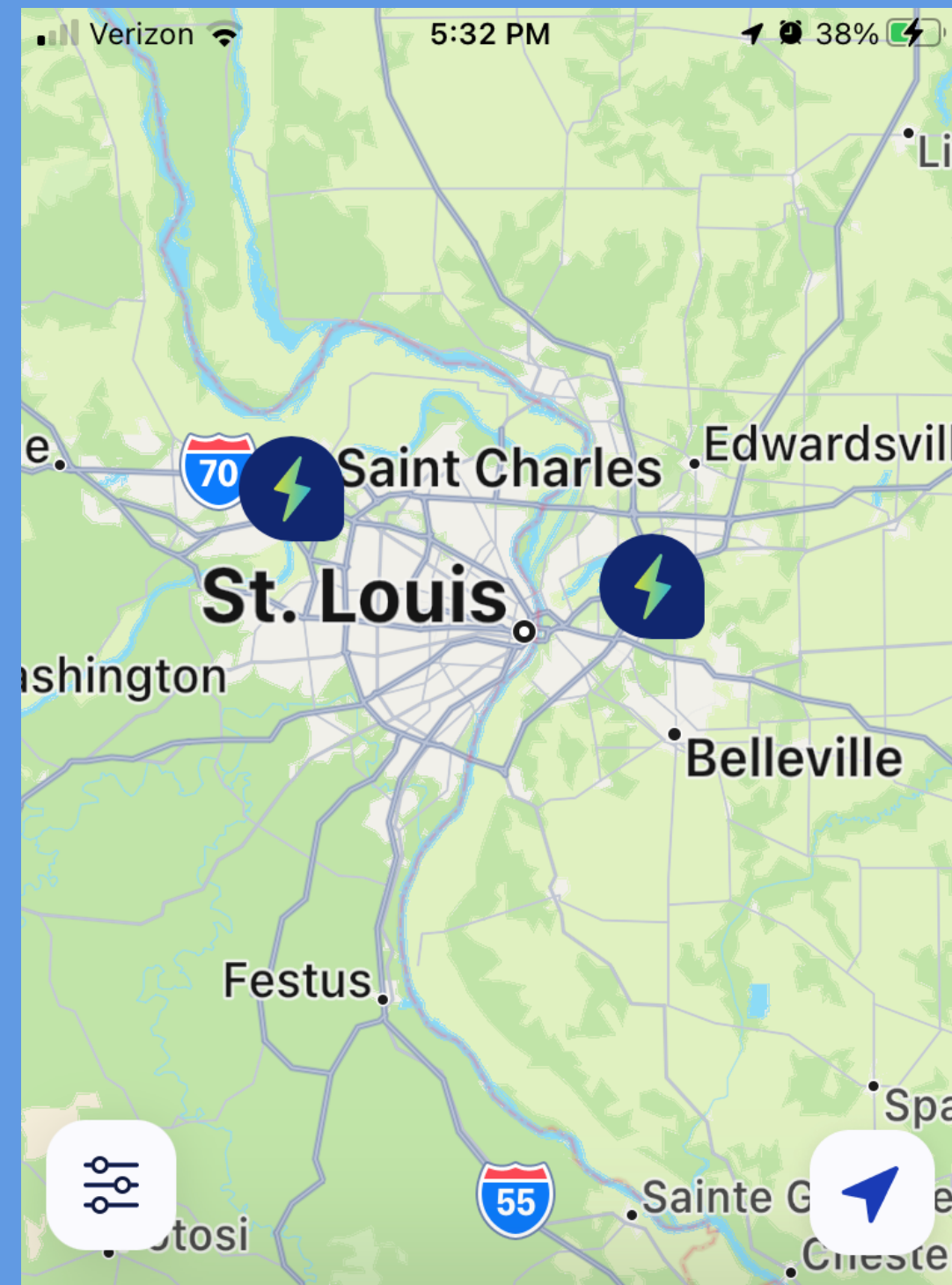




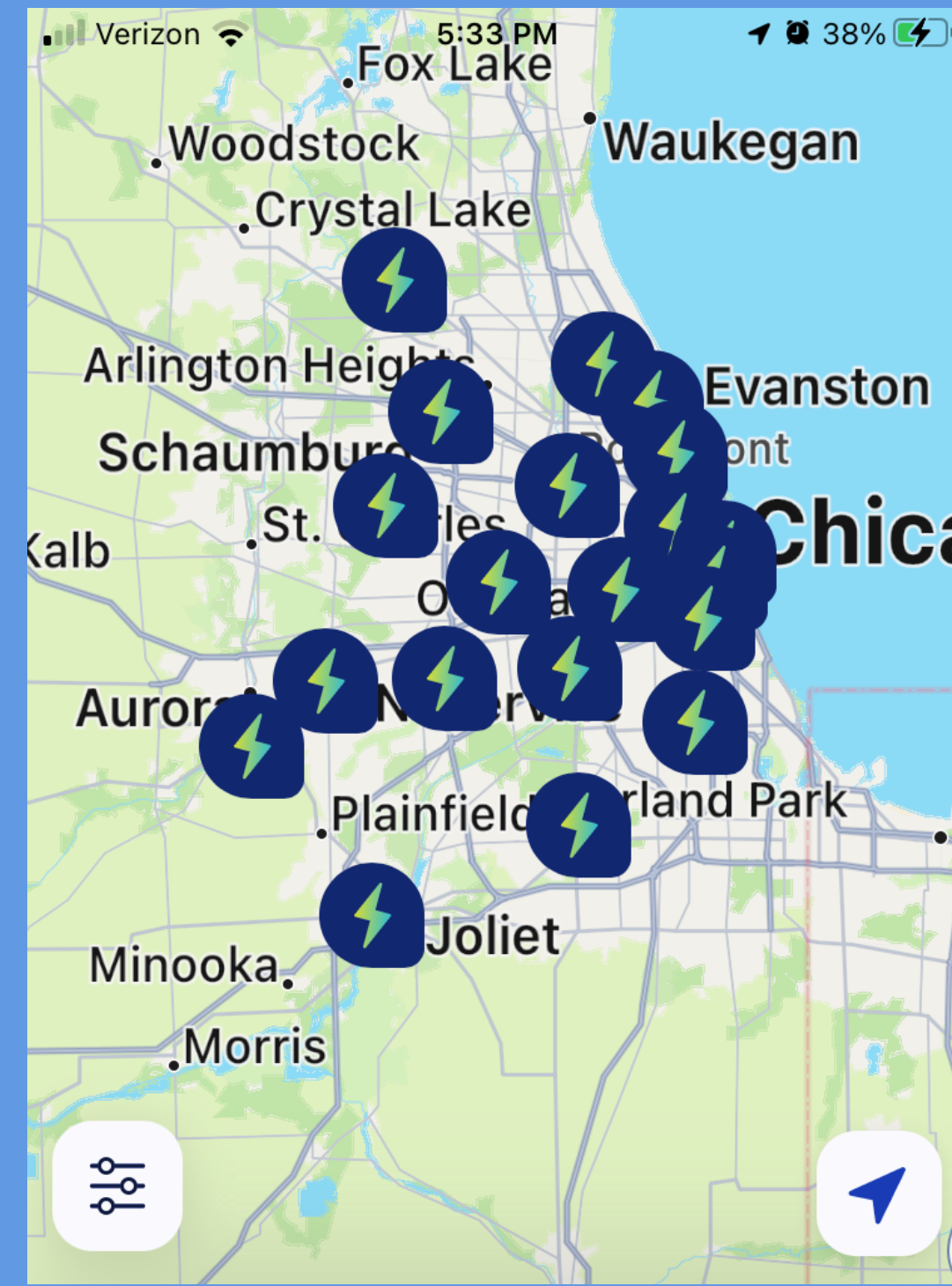
# Session ??: Charger Apps



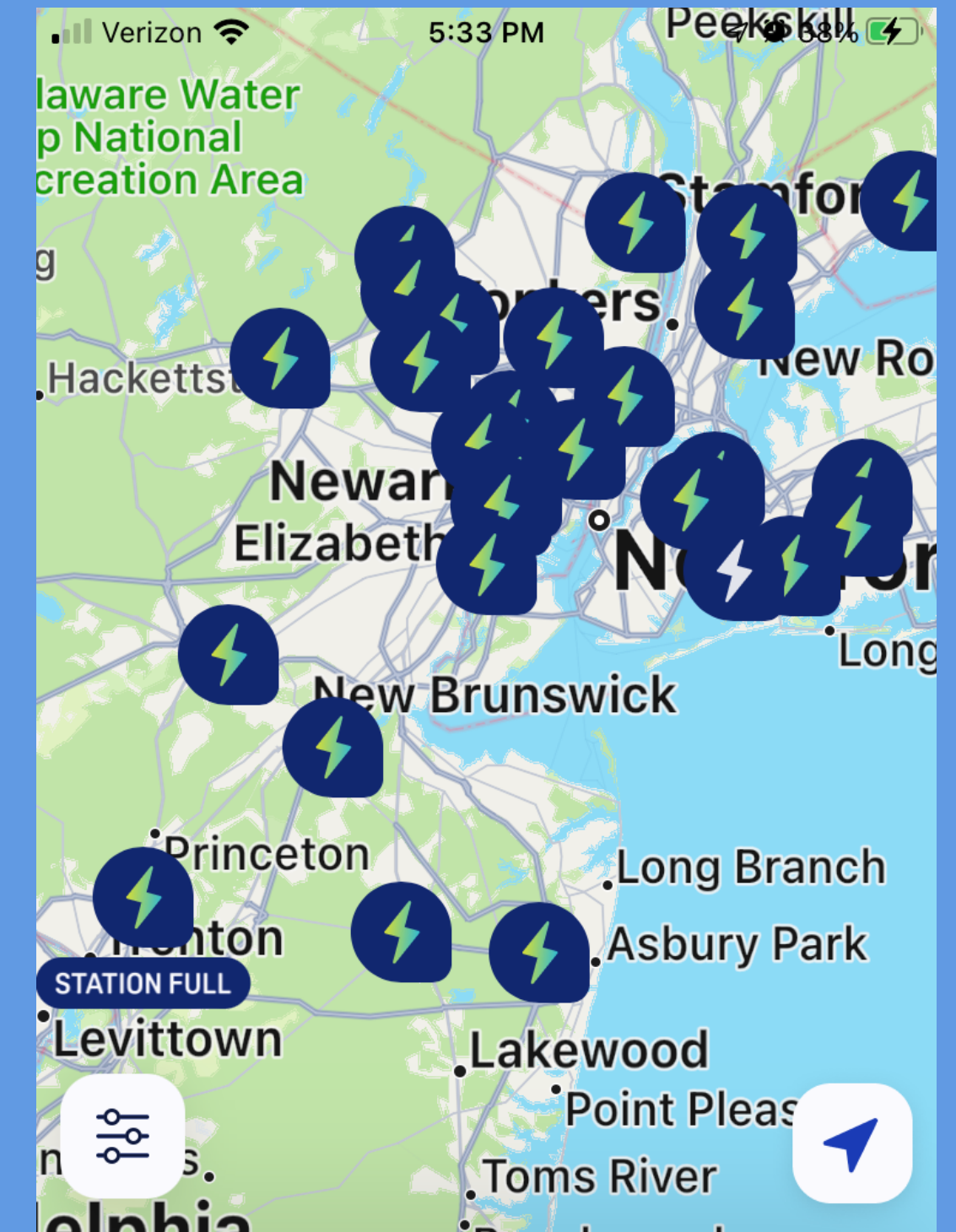
Los Angeles



St Louis



Chicago



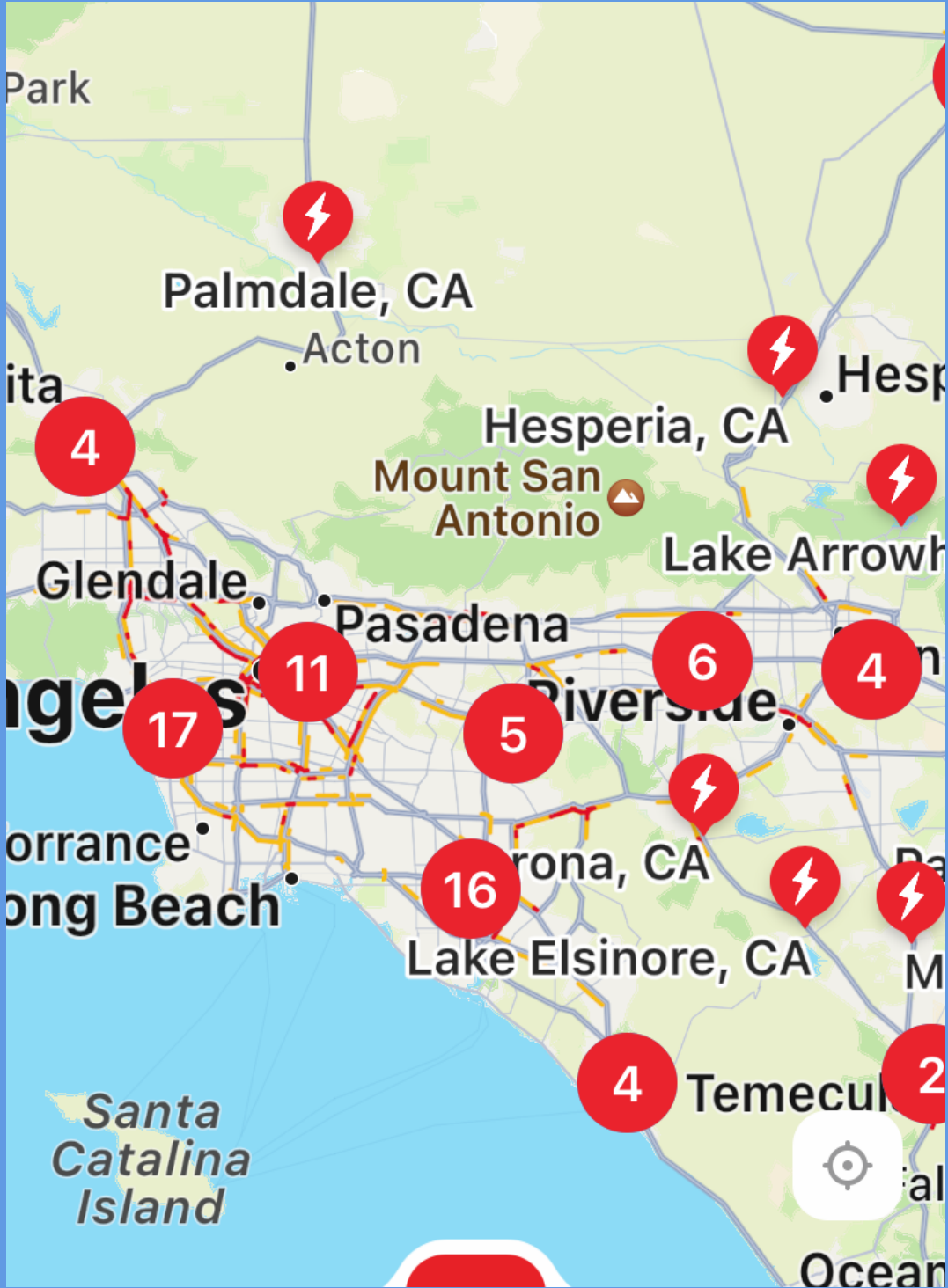
New York

Electrify America  
Individual locations

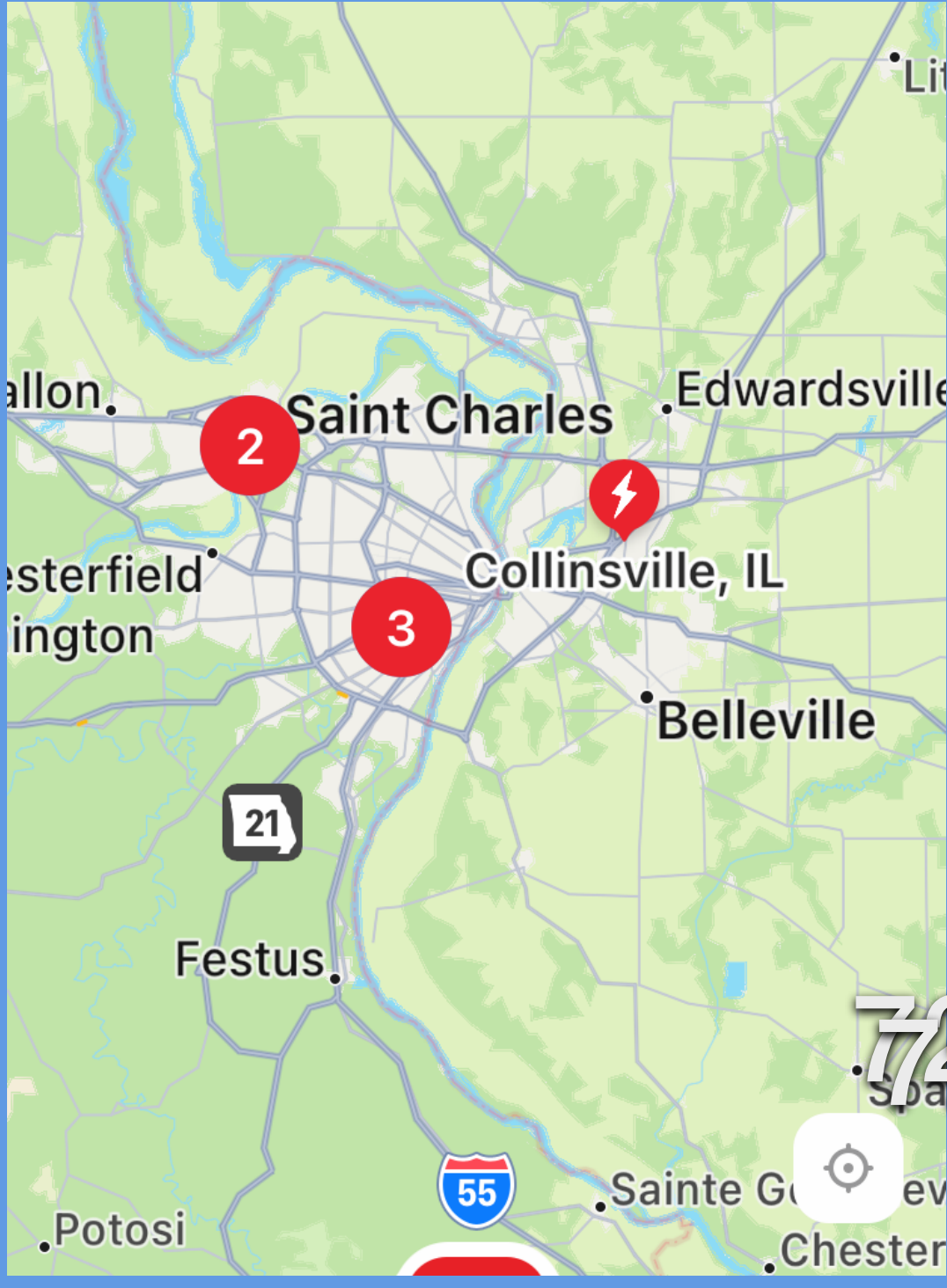
Each map section is the same scale and shows how well each city is served by public charging. Note: it shows which locations are full.



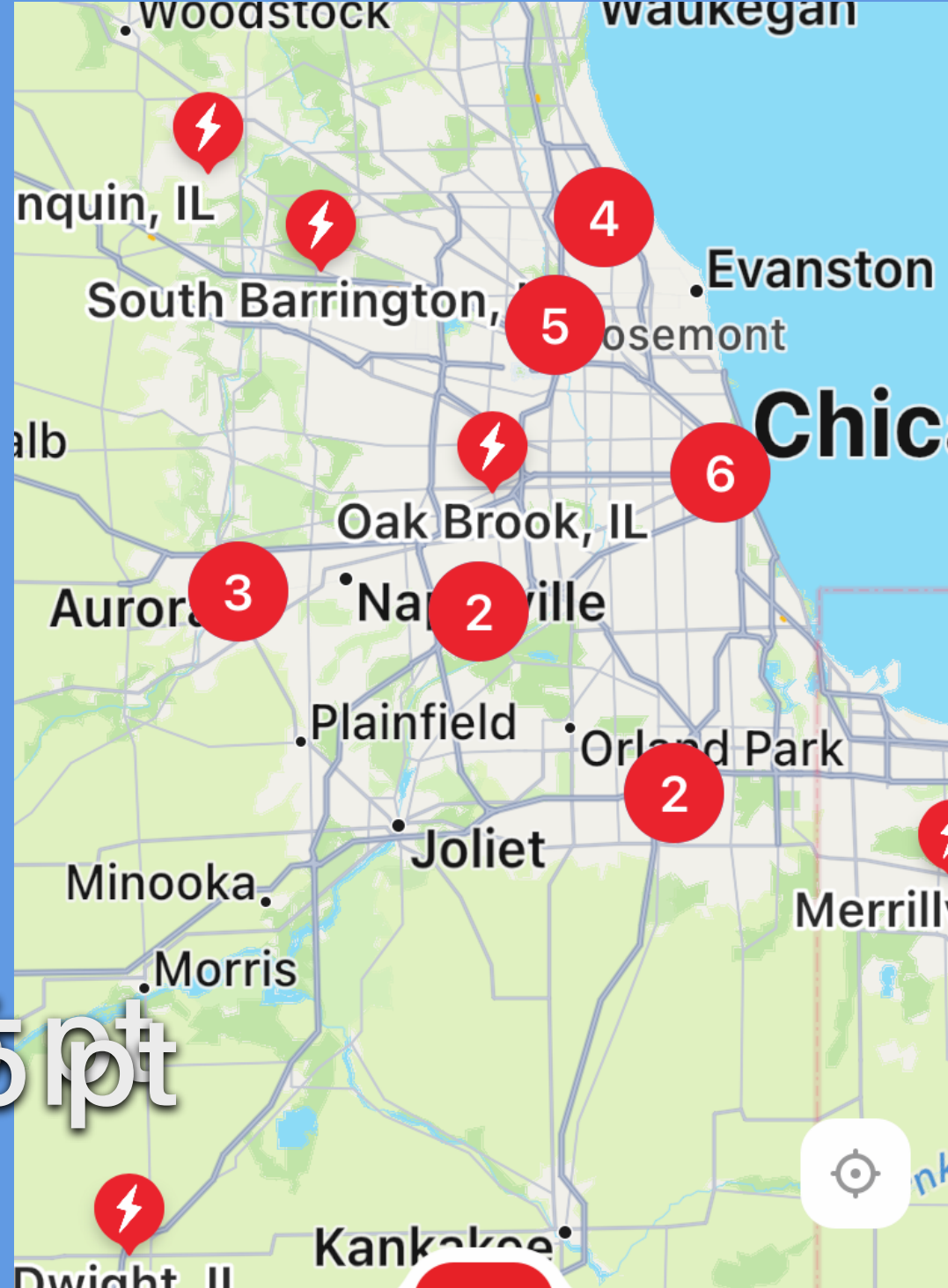
# Session ??: Charger Apps



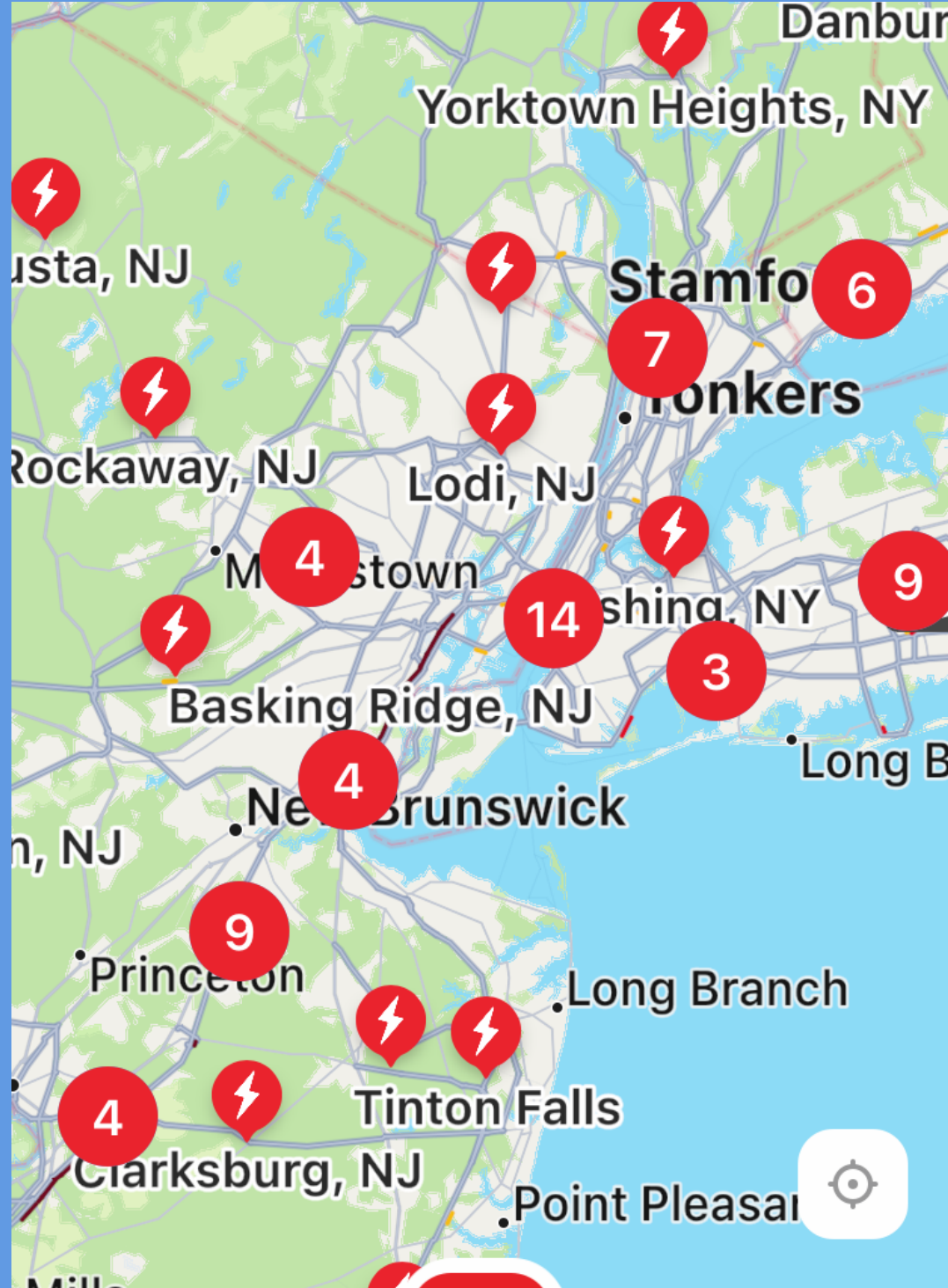
Los Angeles



St Louis



Chicago



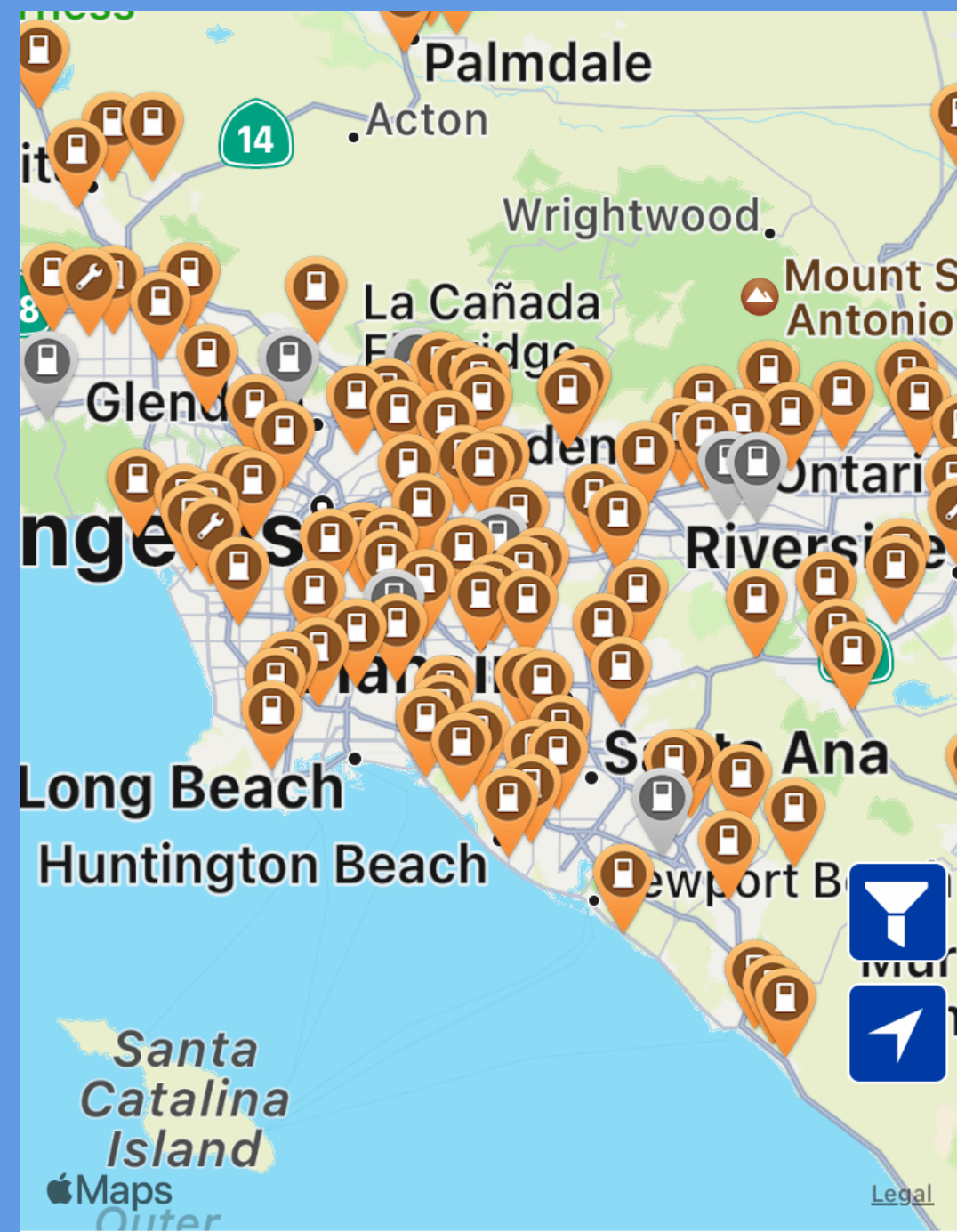
New York

Tesla Superchargers  
Groups of locations

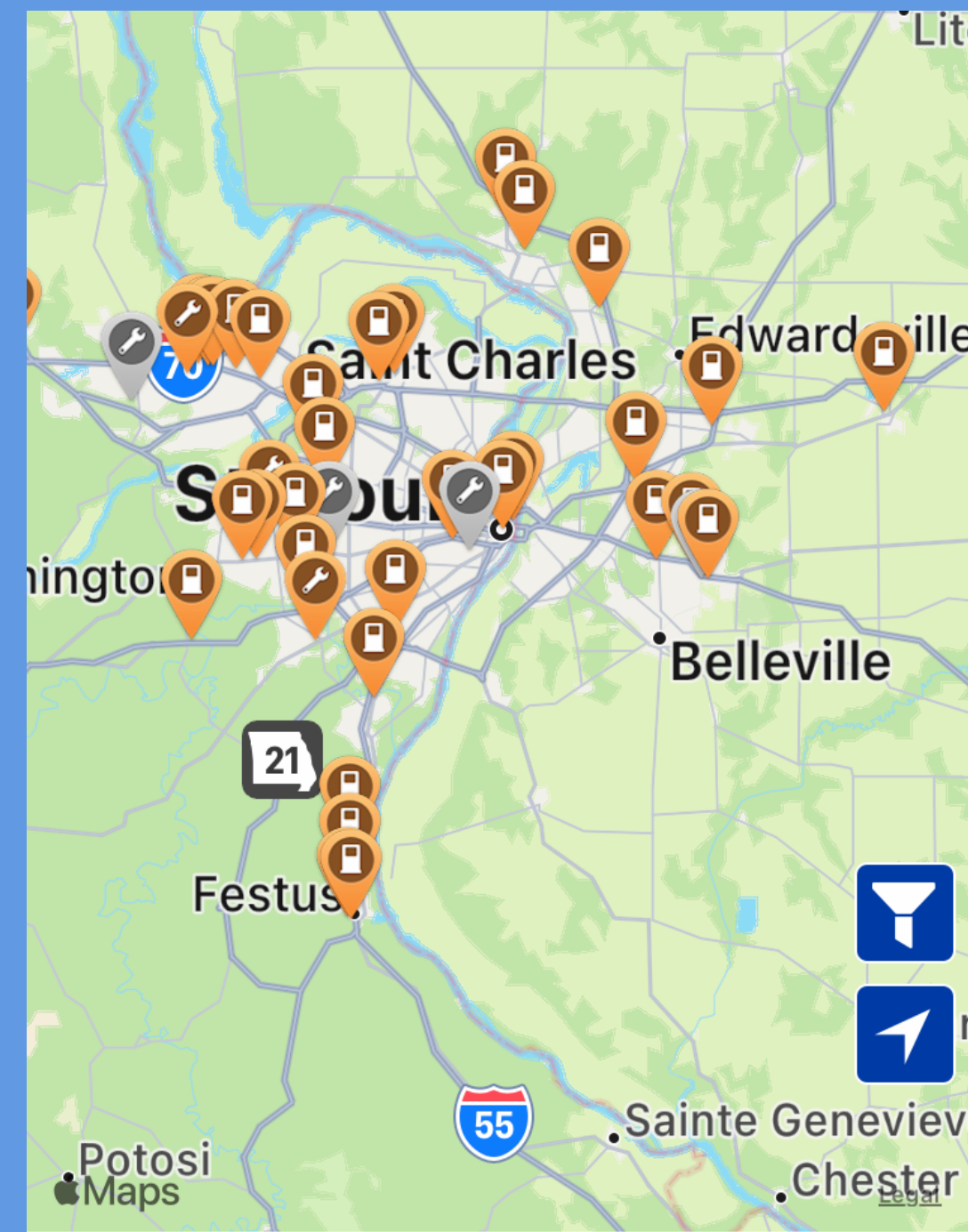
Each map section is the same scale and shows how well each city is served by public charging



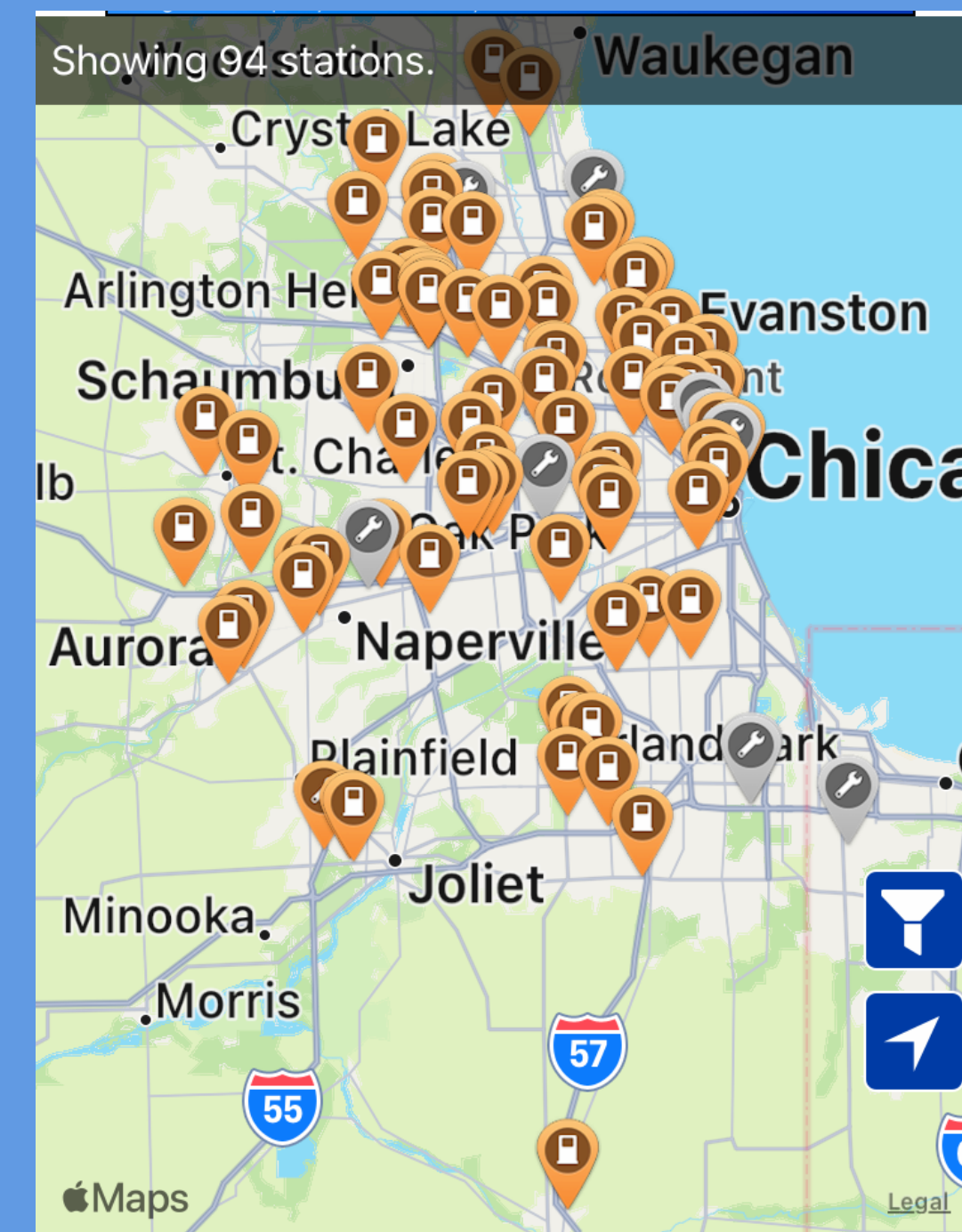
# Session ??: Charger Apps



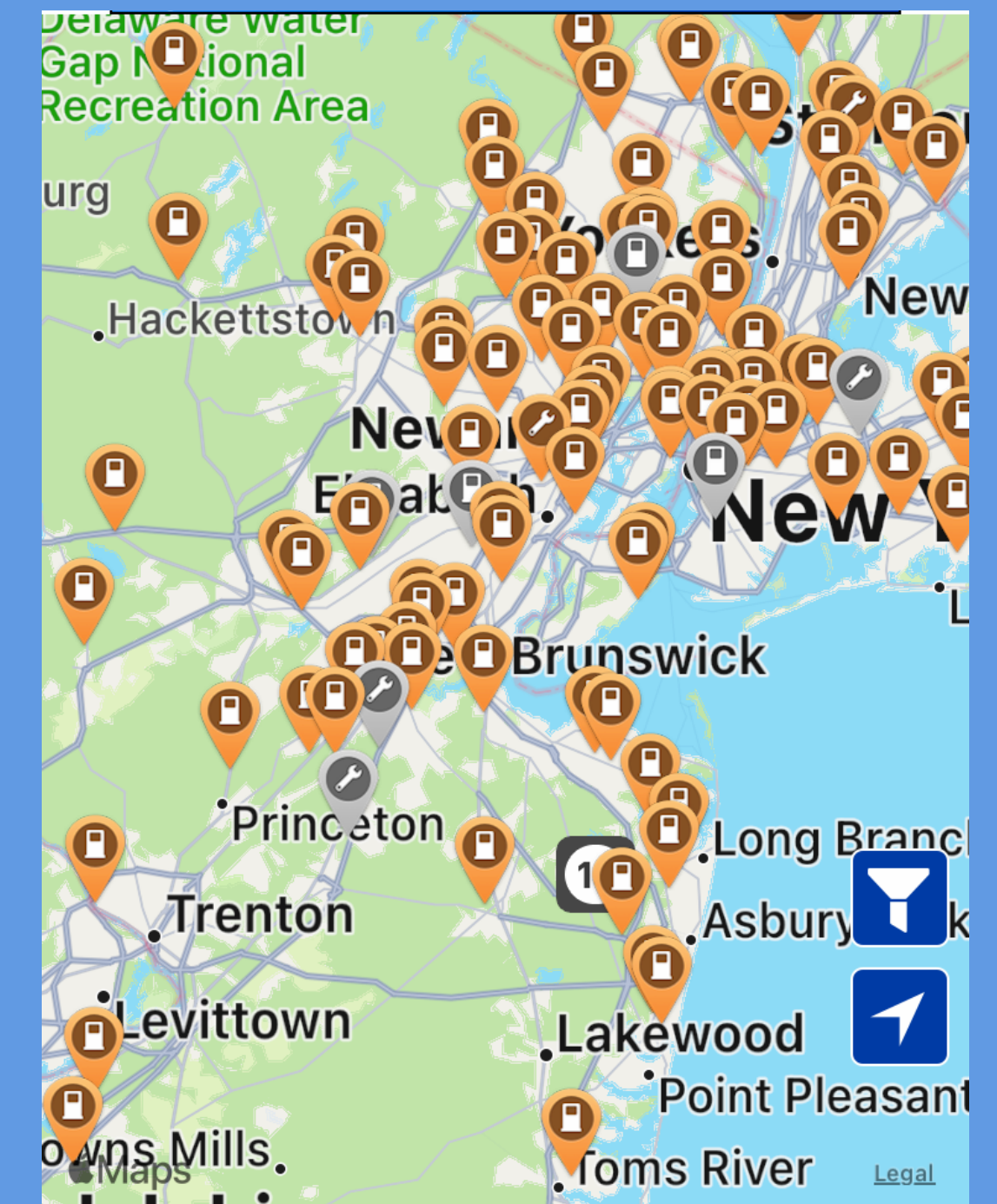
Los Angeles



St Louis



Chicago



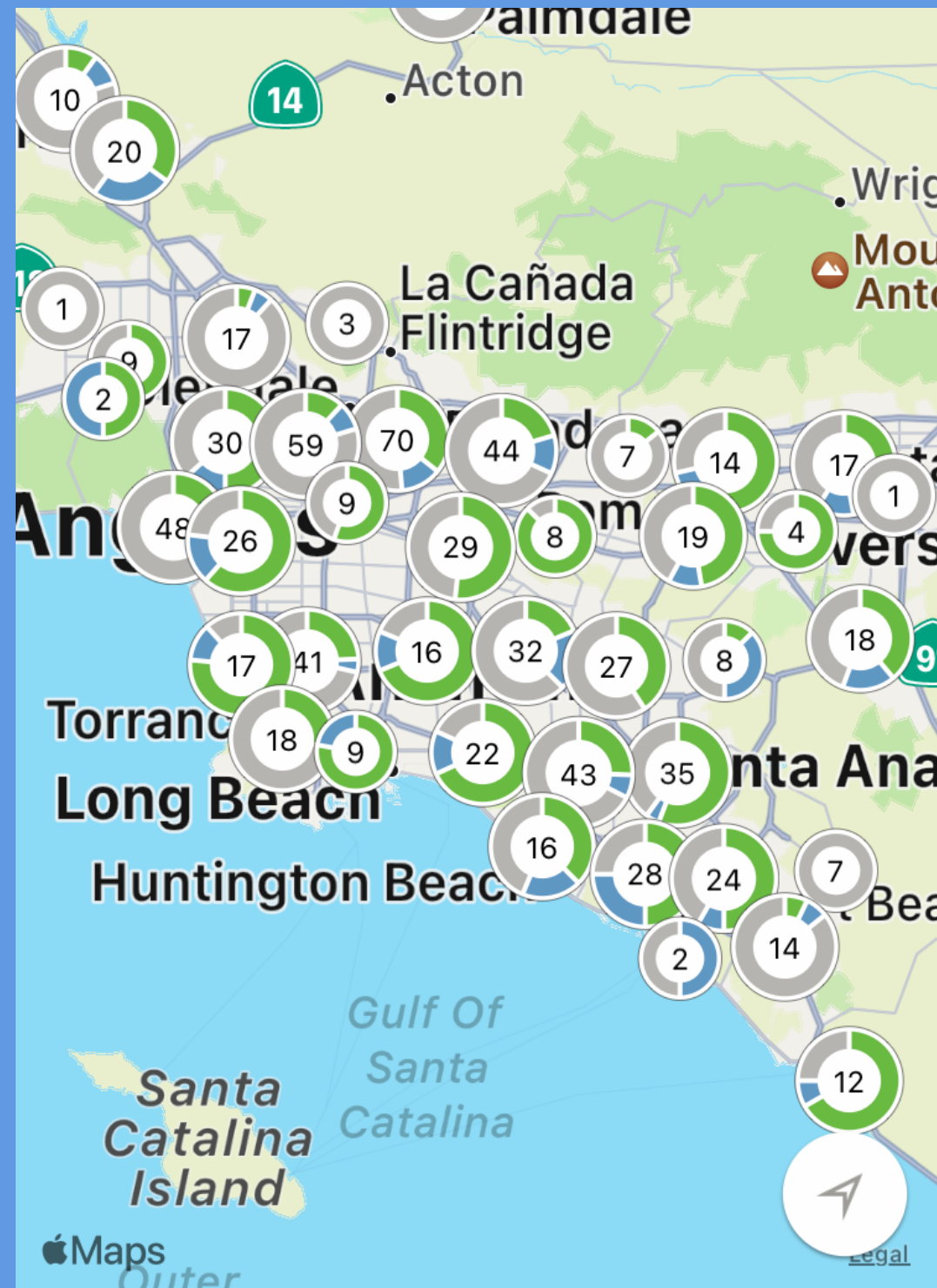
New York

PlugShare  
Individual locations

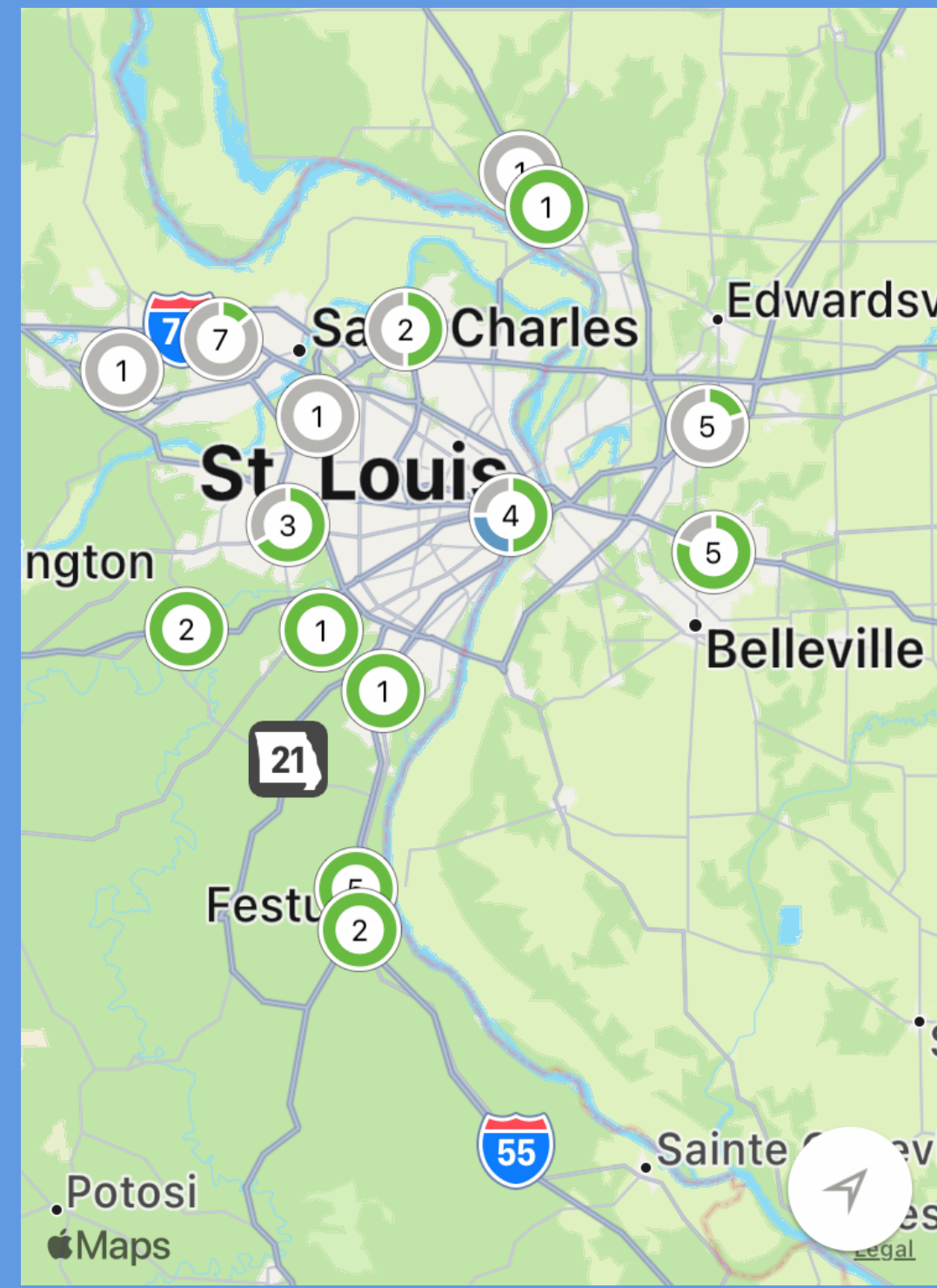
Each map section is the same scale and shows how well each city is served by public charging



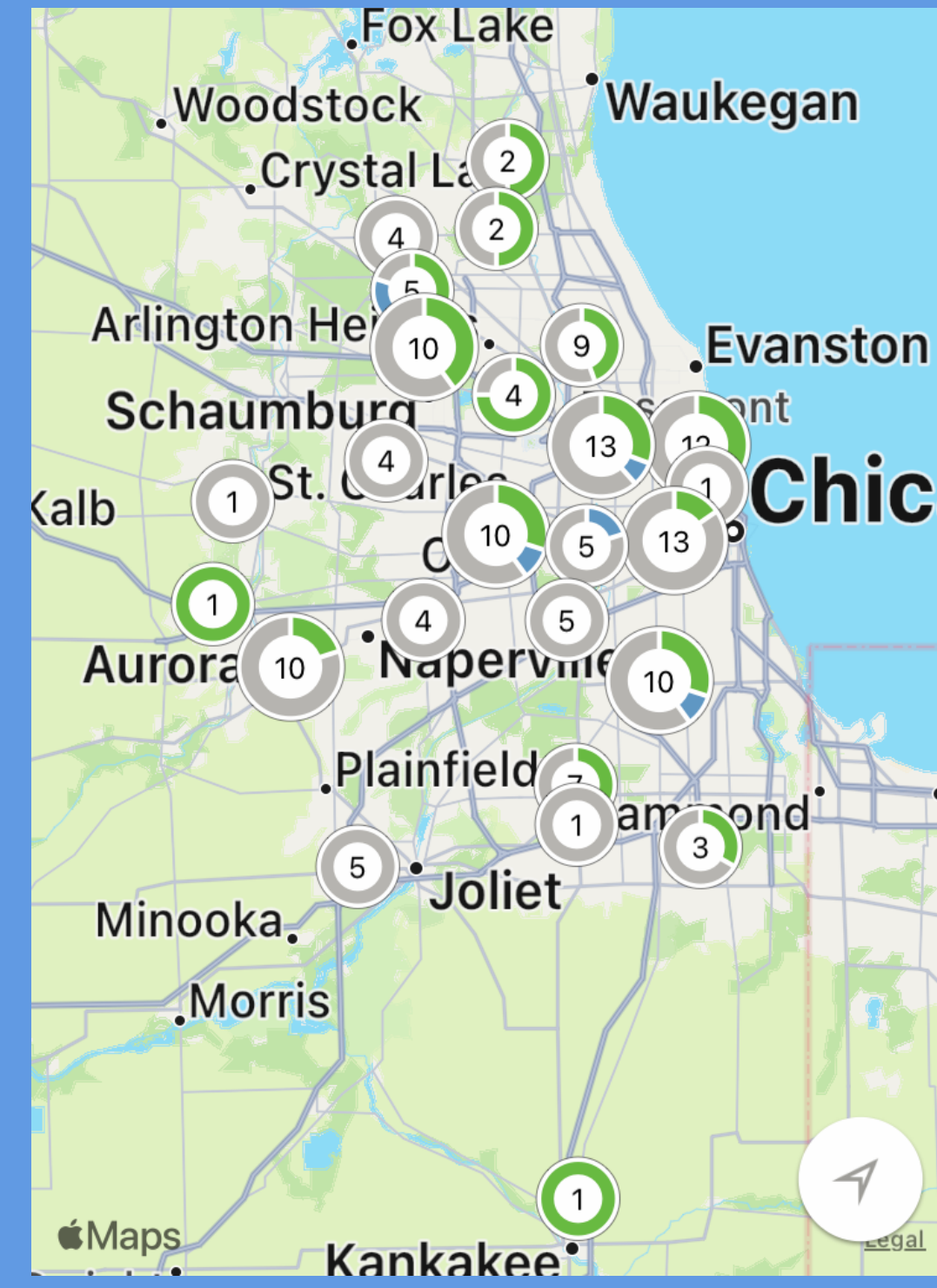
# Session ??: Charger Apps



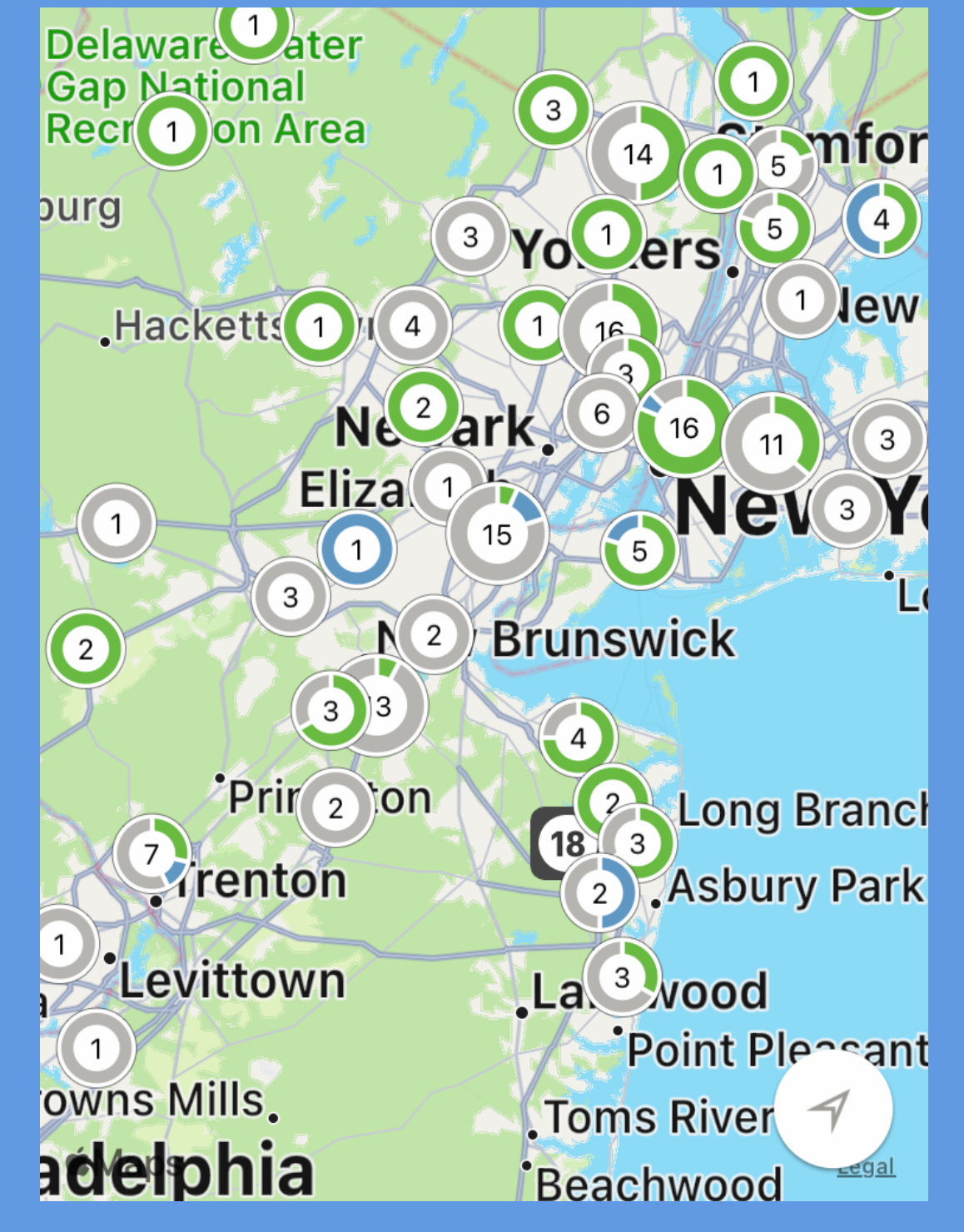
Los Angeles



St Louis



Chicago



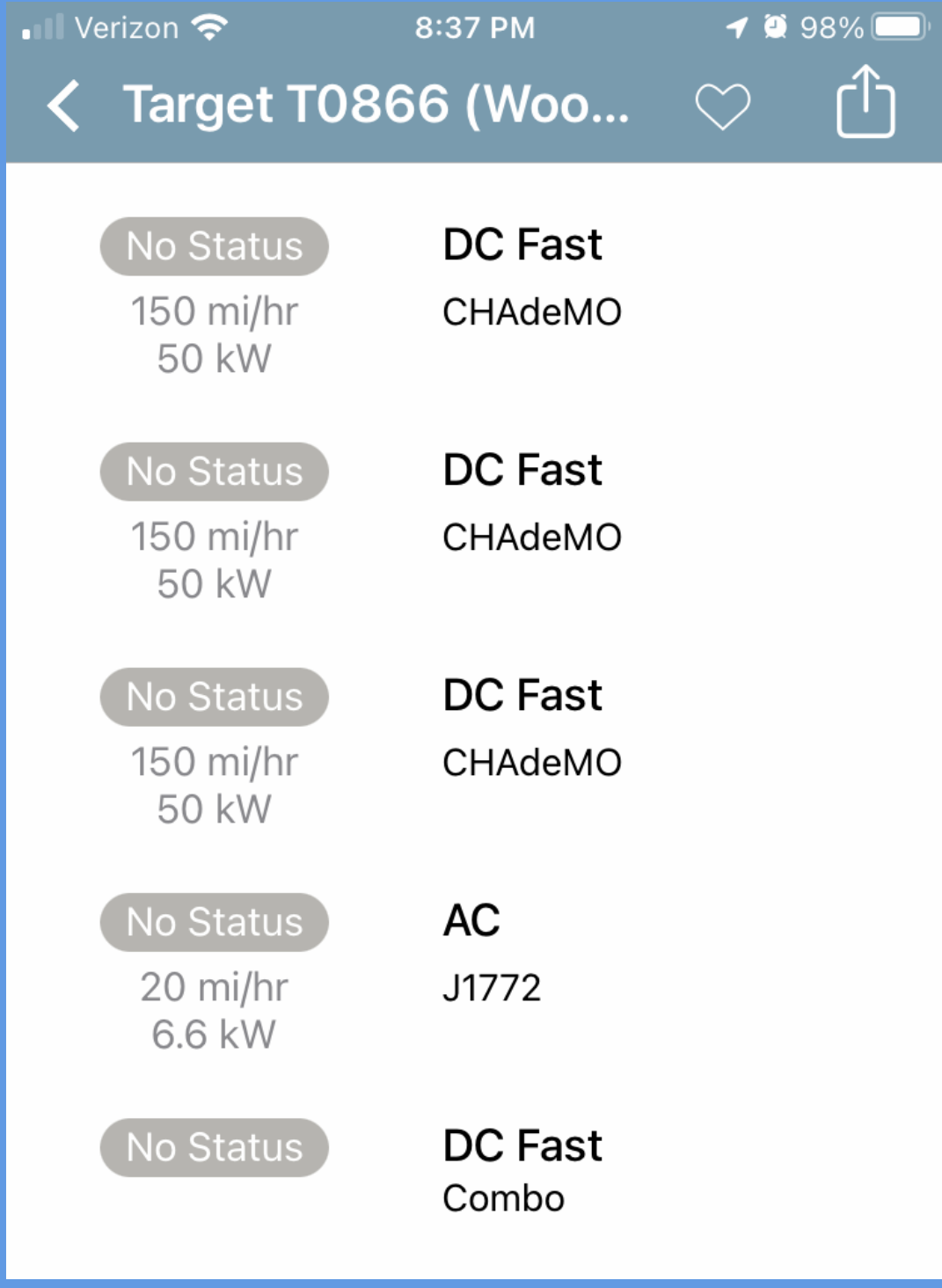
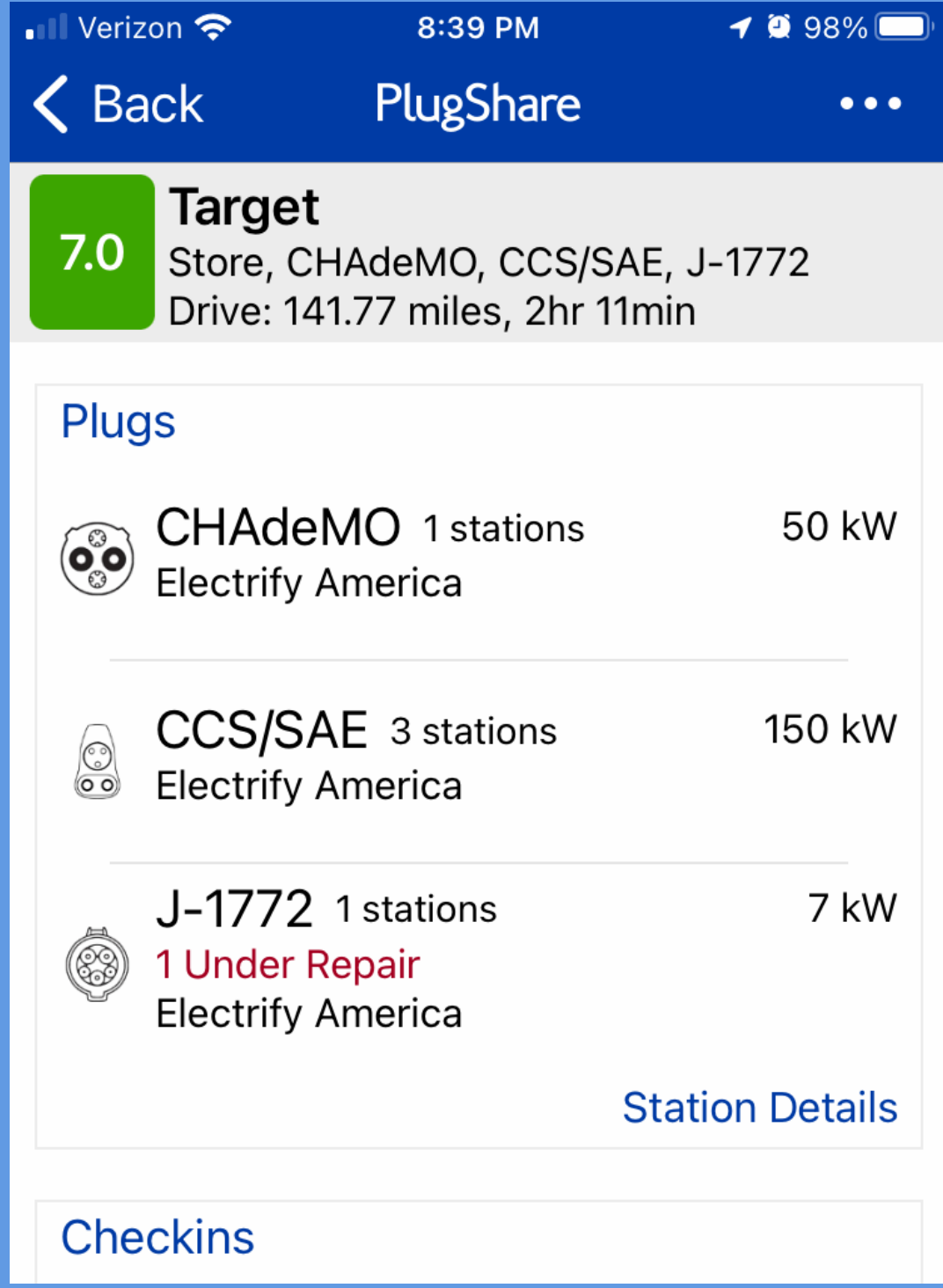
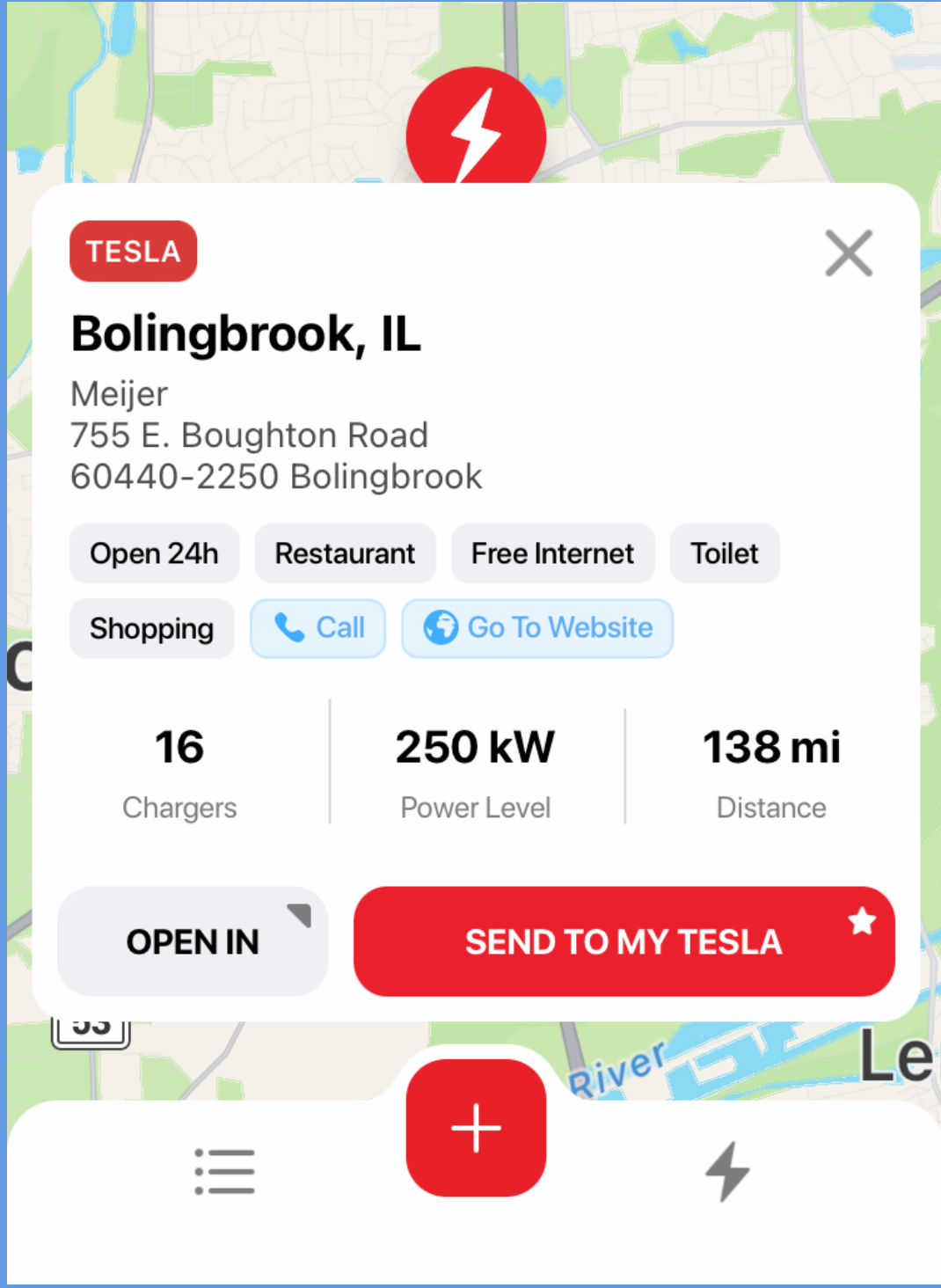
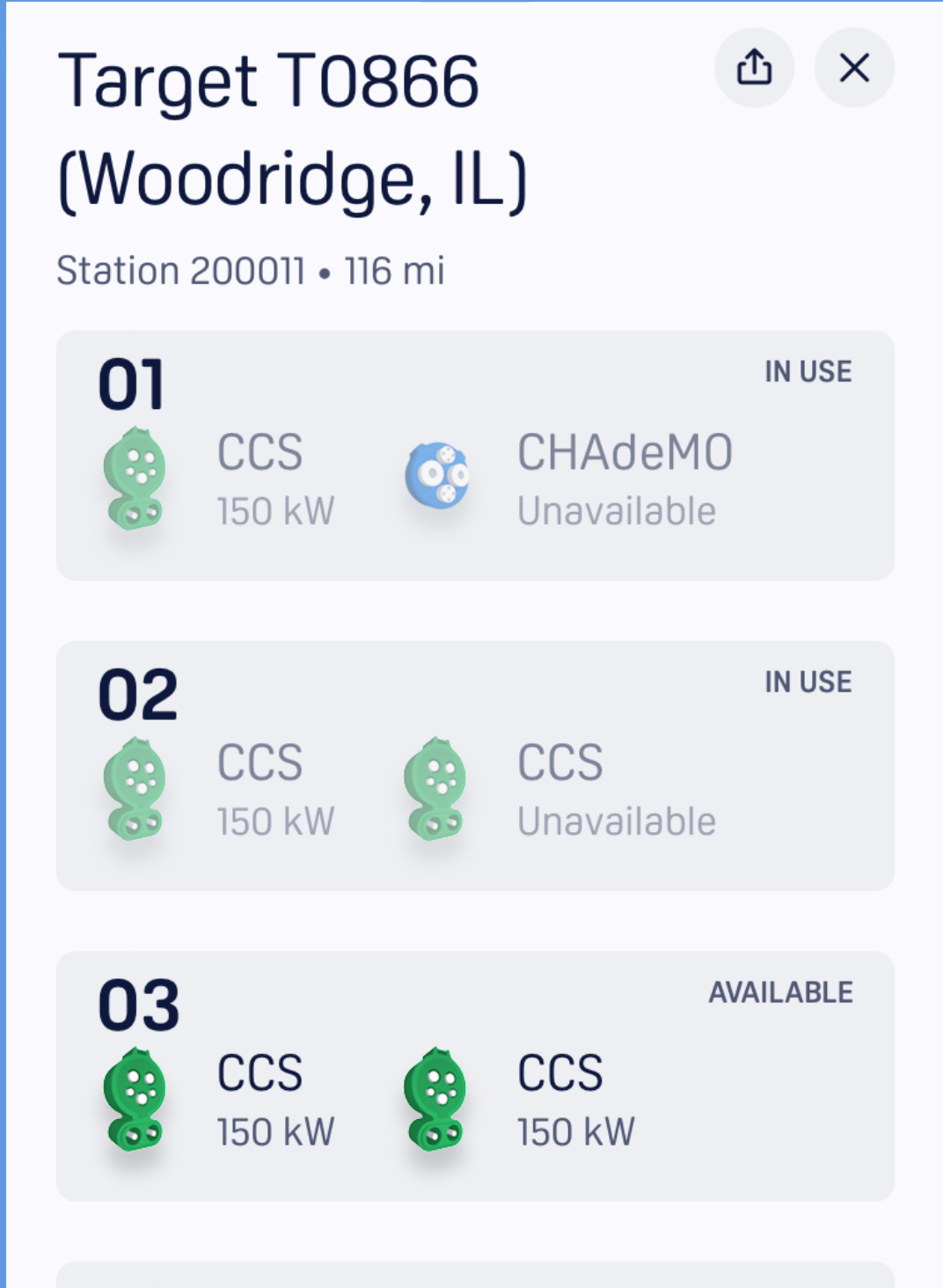
New York

ChargePoint  
Grouped locations and  
current usage.

Each map section is the same scale and shows  
how well each city is served by public charging



# Session ??: Charger Apps



Electrify America

Tesla

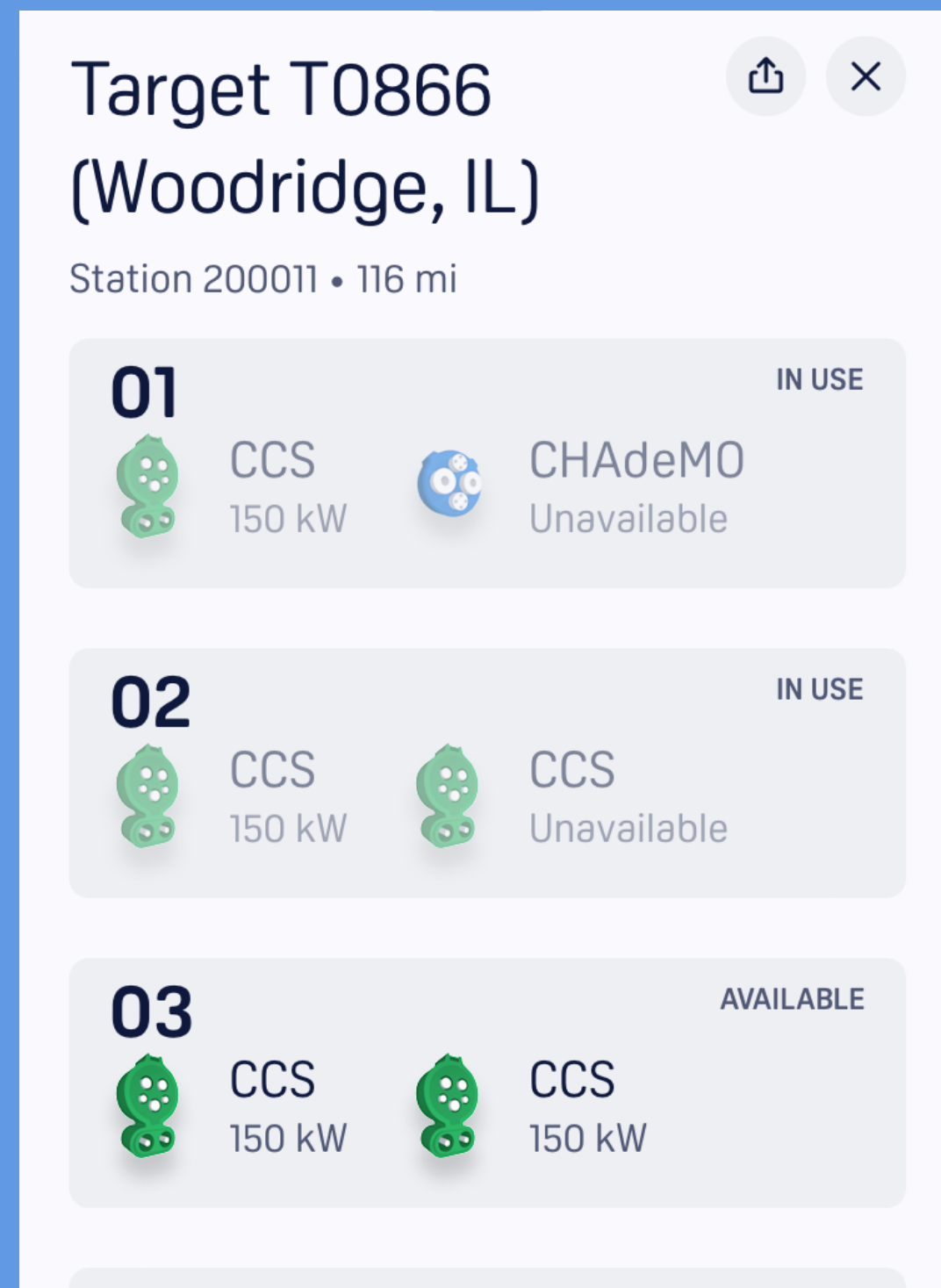
Plugshare

ChargePoint

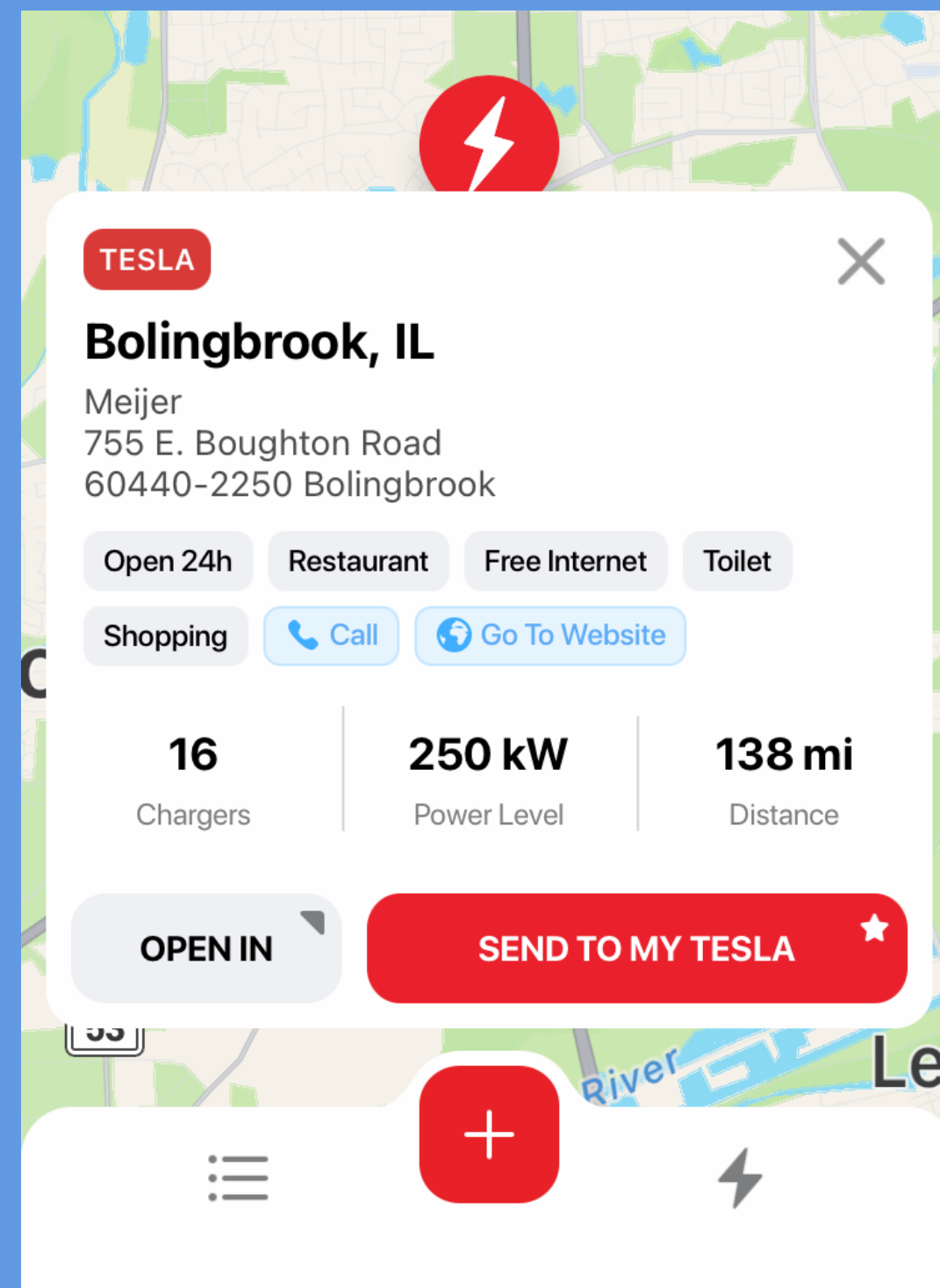
How the four apps display what is available at a location. Electrify America shows charger status and uses a GPS distance (off by 26 miles). Tesla, correct distance and amenities. PlugShare has distance correct, lists correct connectors, shows details with additional tap. (but not status). ChargePoint also does GPS distance, does list the chargers correctly.



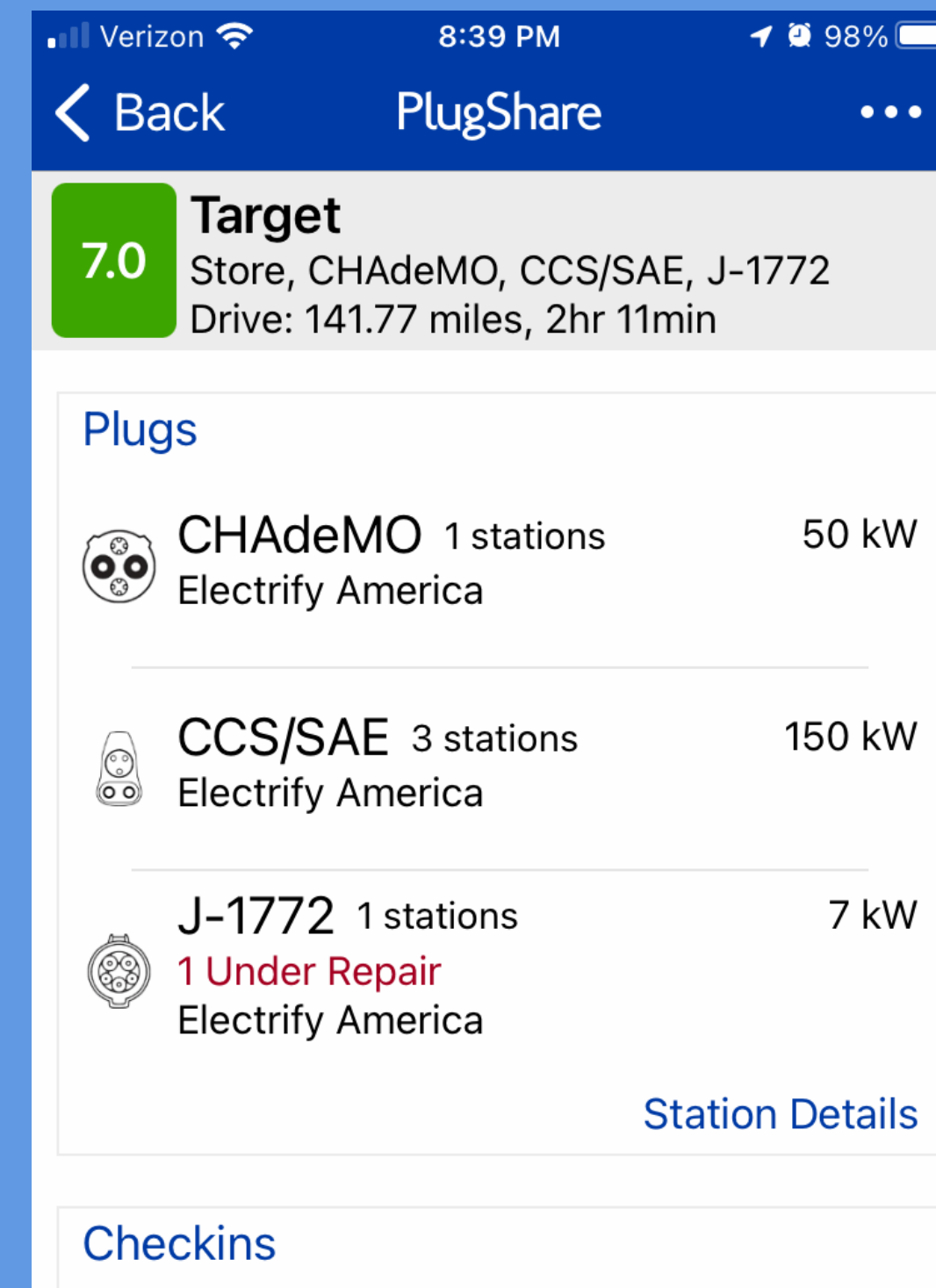
# Session ??: Charger Apps



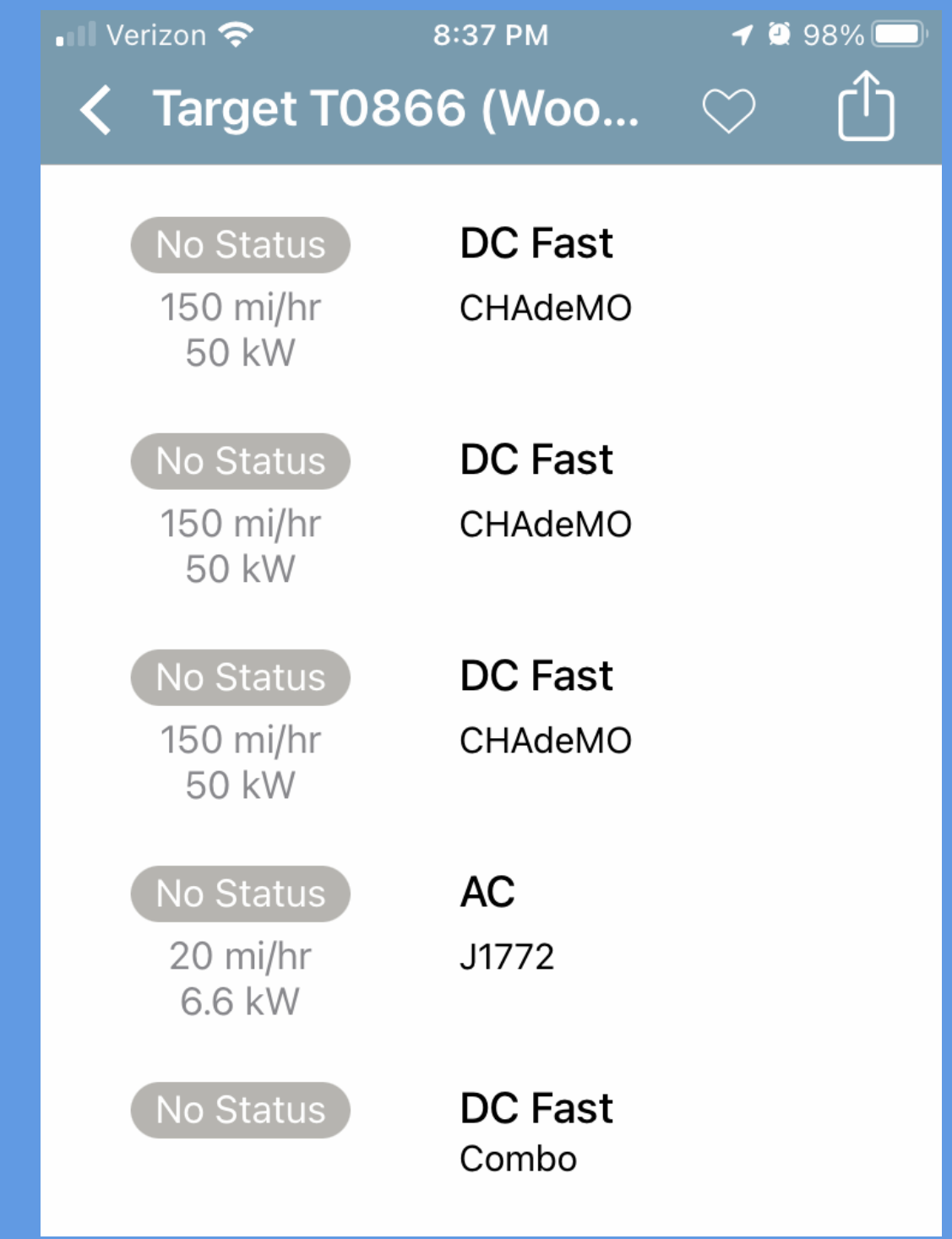
Electrify America



Tesla



Plugshare

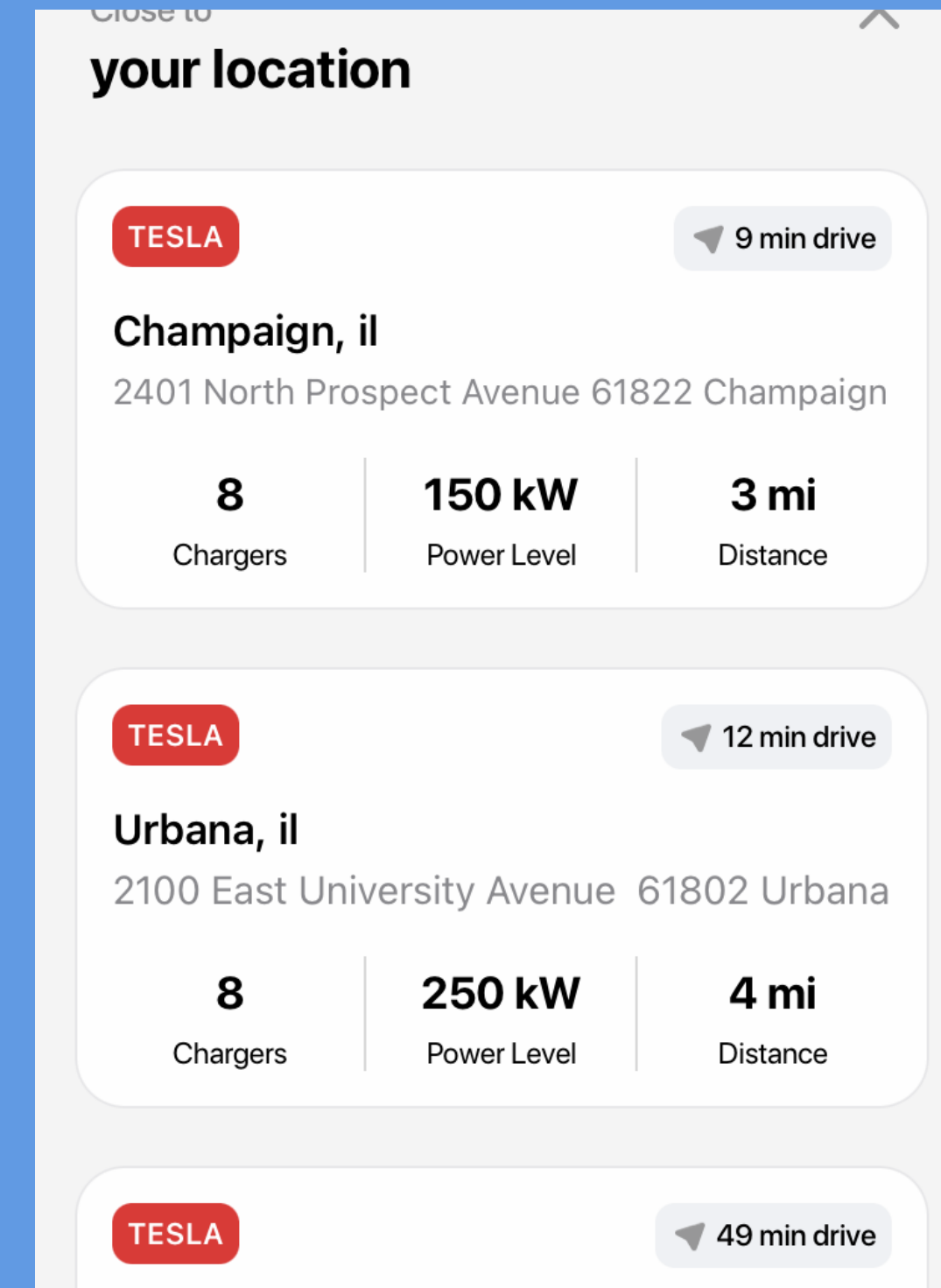
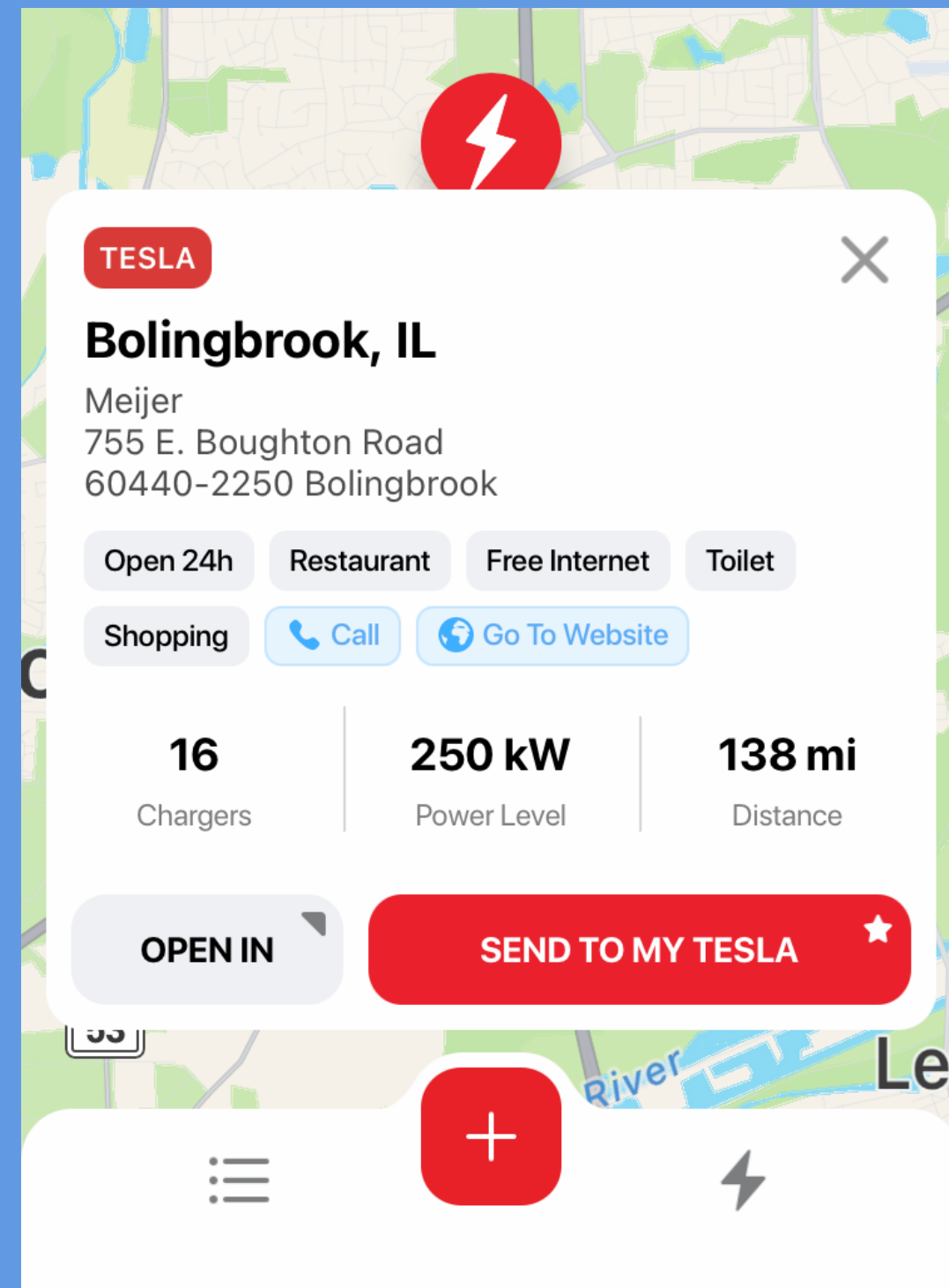
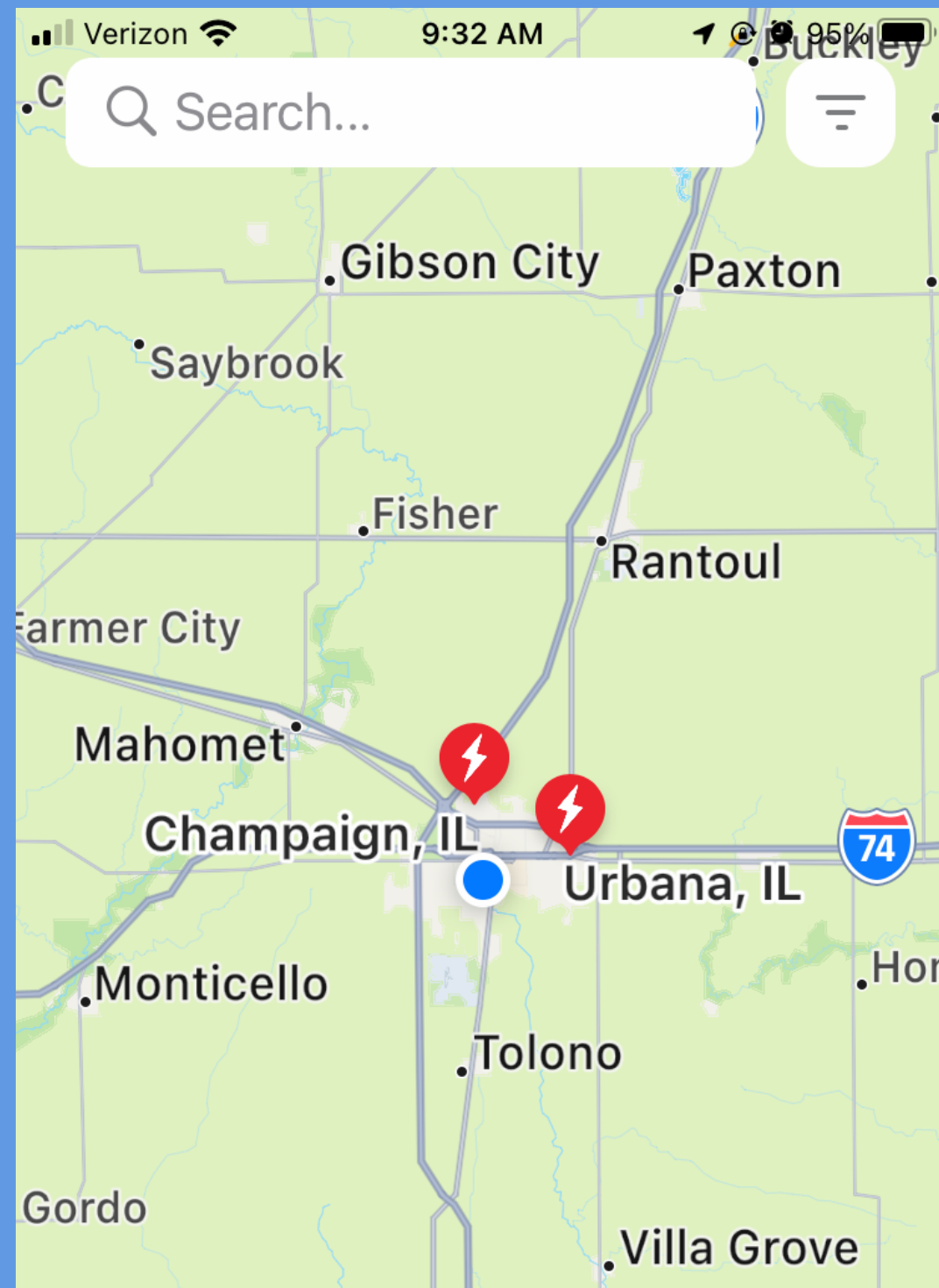


ChargePoint

PlugShare is one of the few apps with comments and reviews. Tesla, Electrify America, ChargePoint and others generally will post if a charger is “unavailable” but will not have comments. PlugShare does not have access to network information and will not have information if a charger is currently in use.



# Session ??: Charger Apps



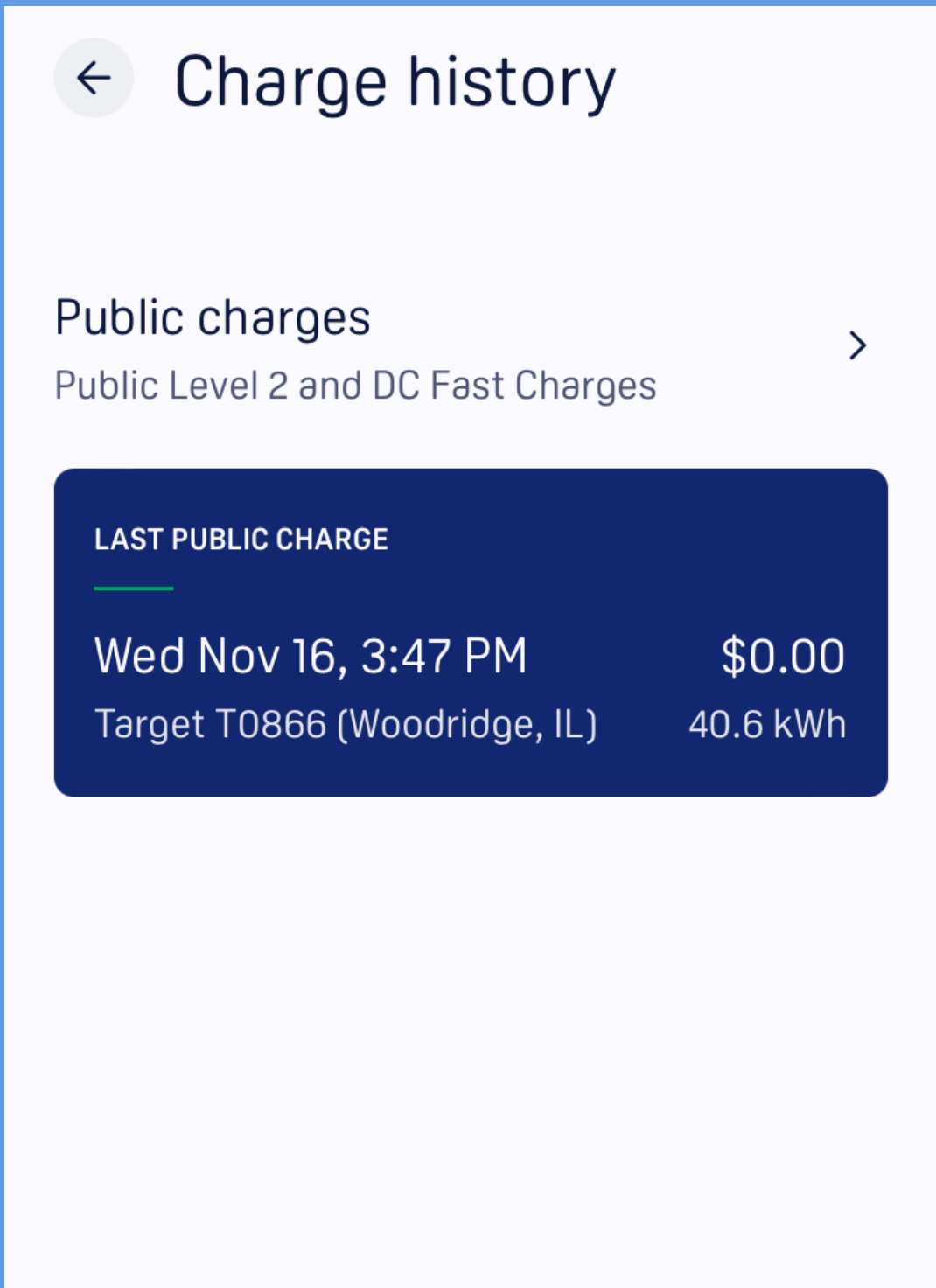
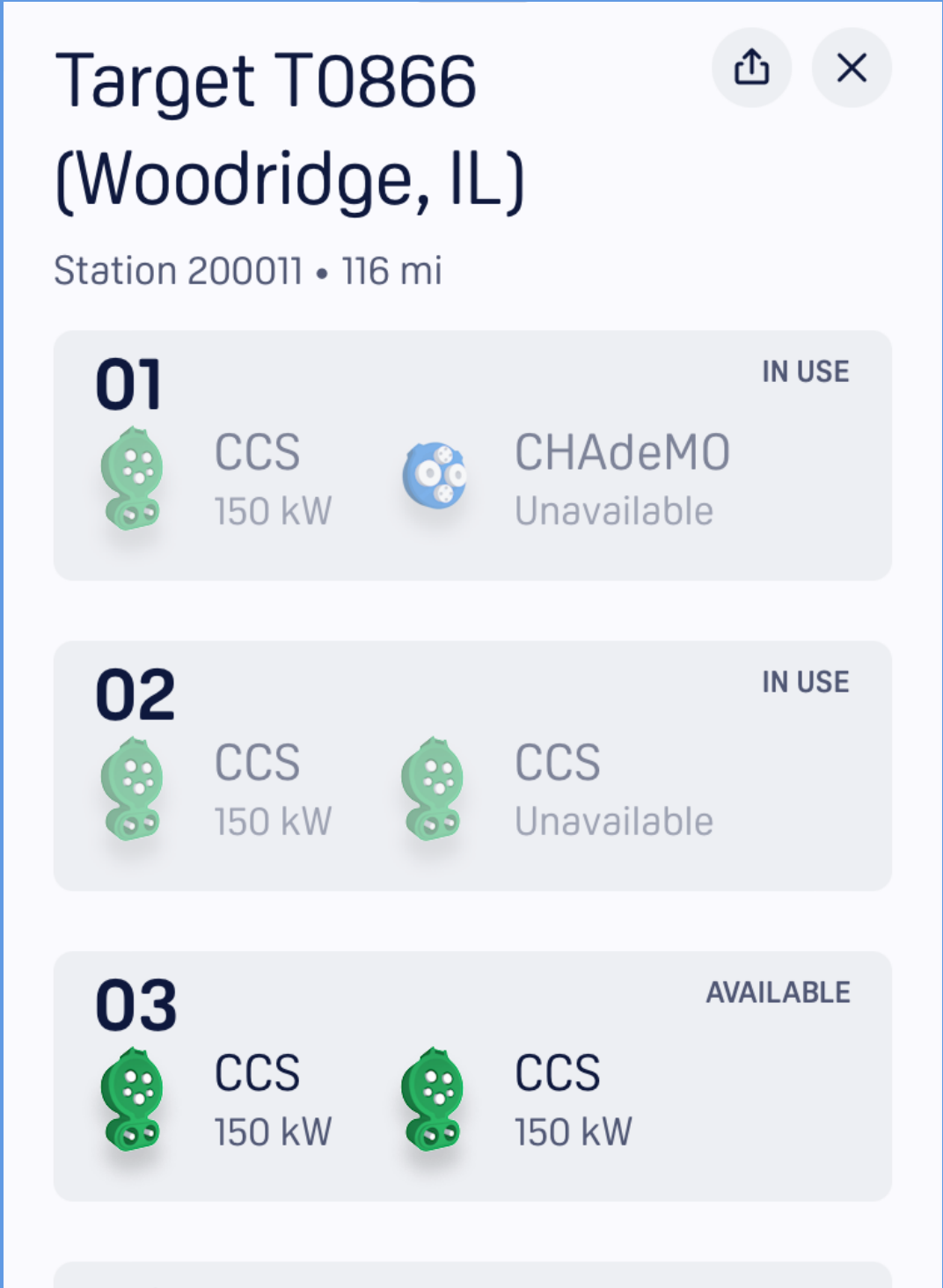
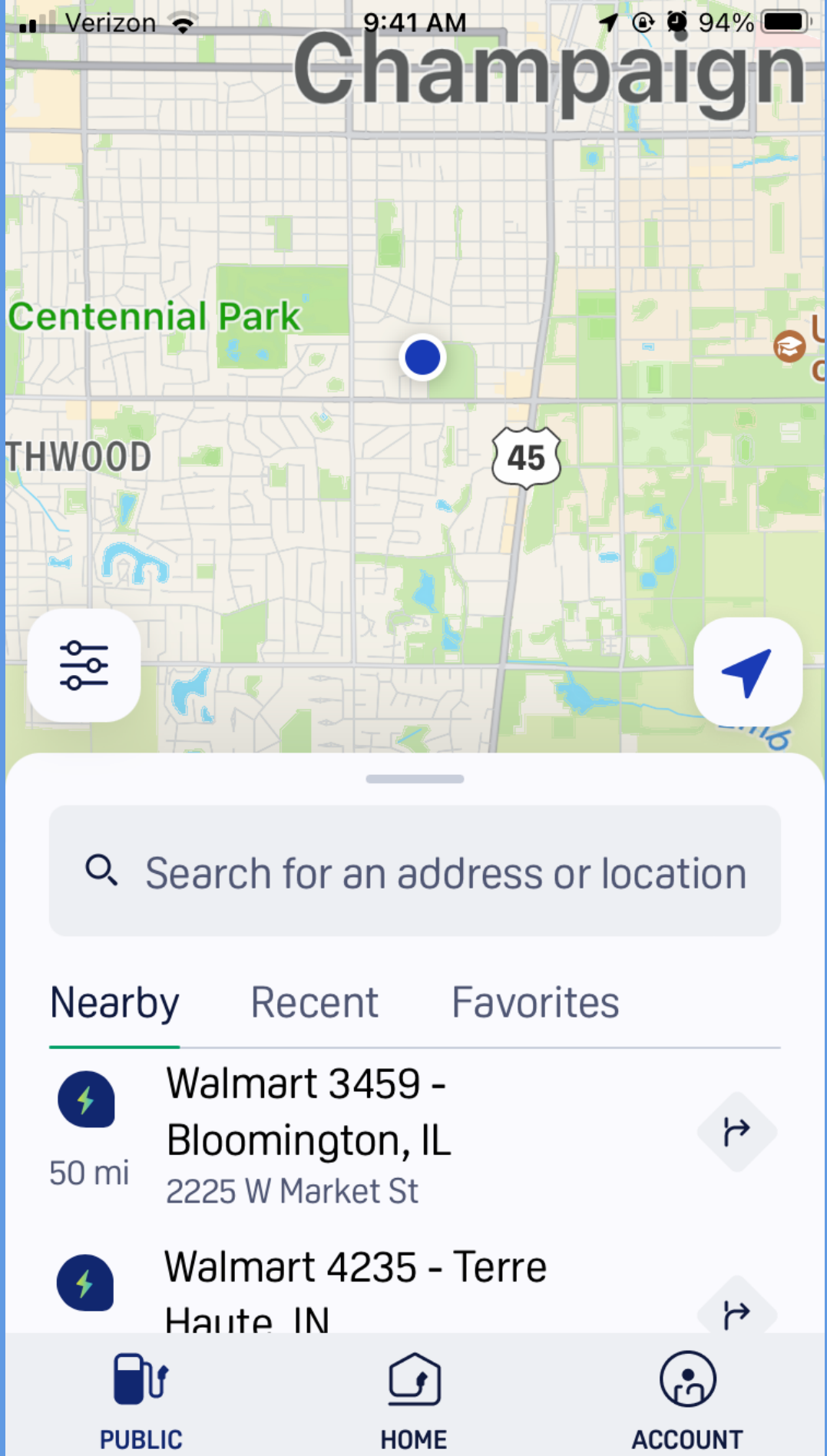
Tesla is its own world - you only need it if you own one.

Left image the start screen if you're in Champaign, center -the location on I355, right - details of current location.

# Tesla



# Session ??: Charger Apps

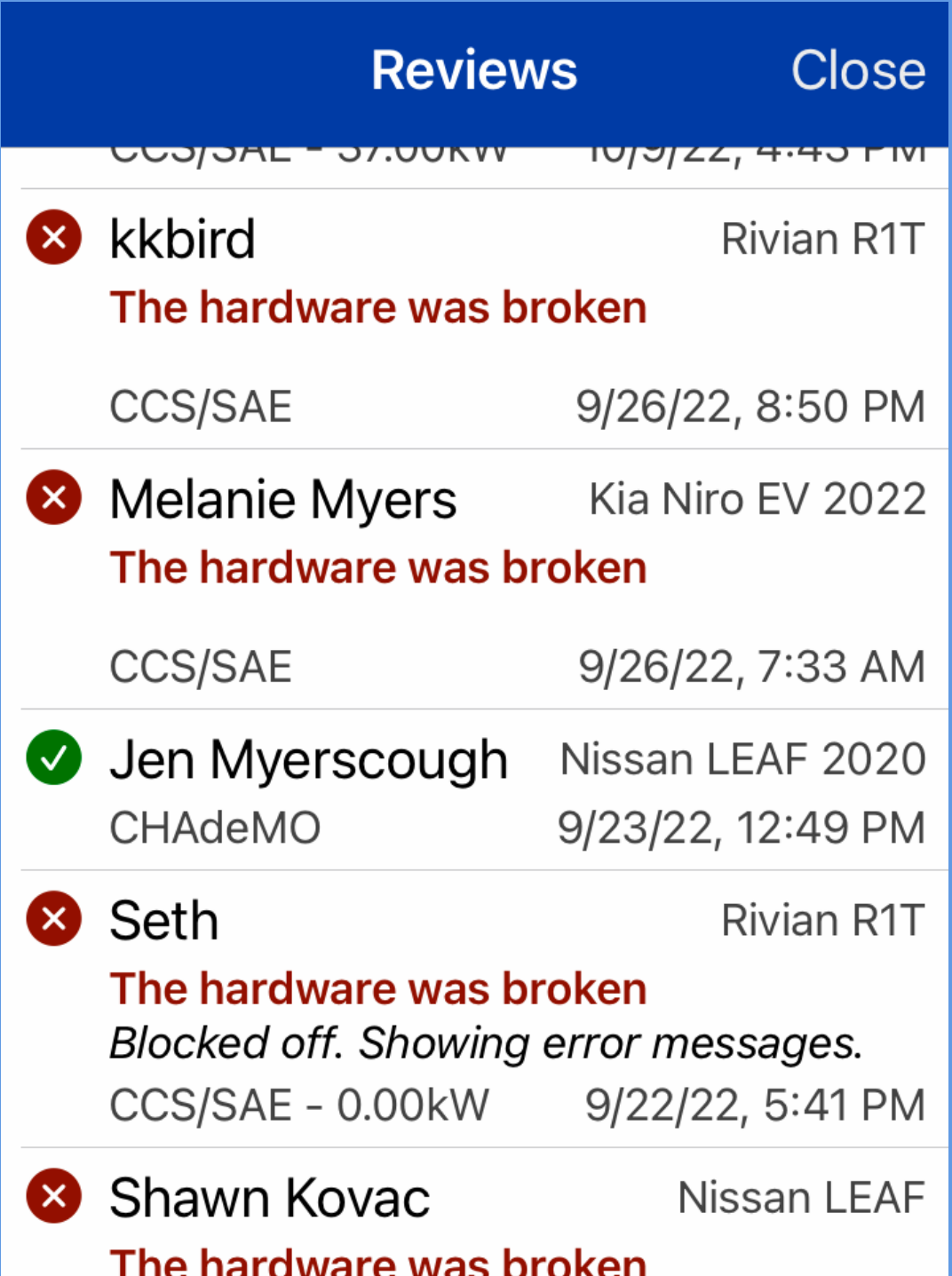
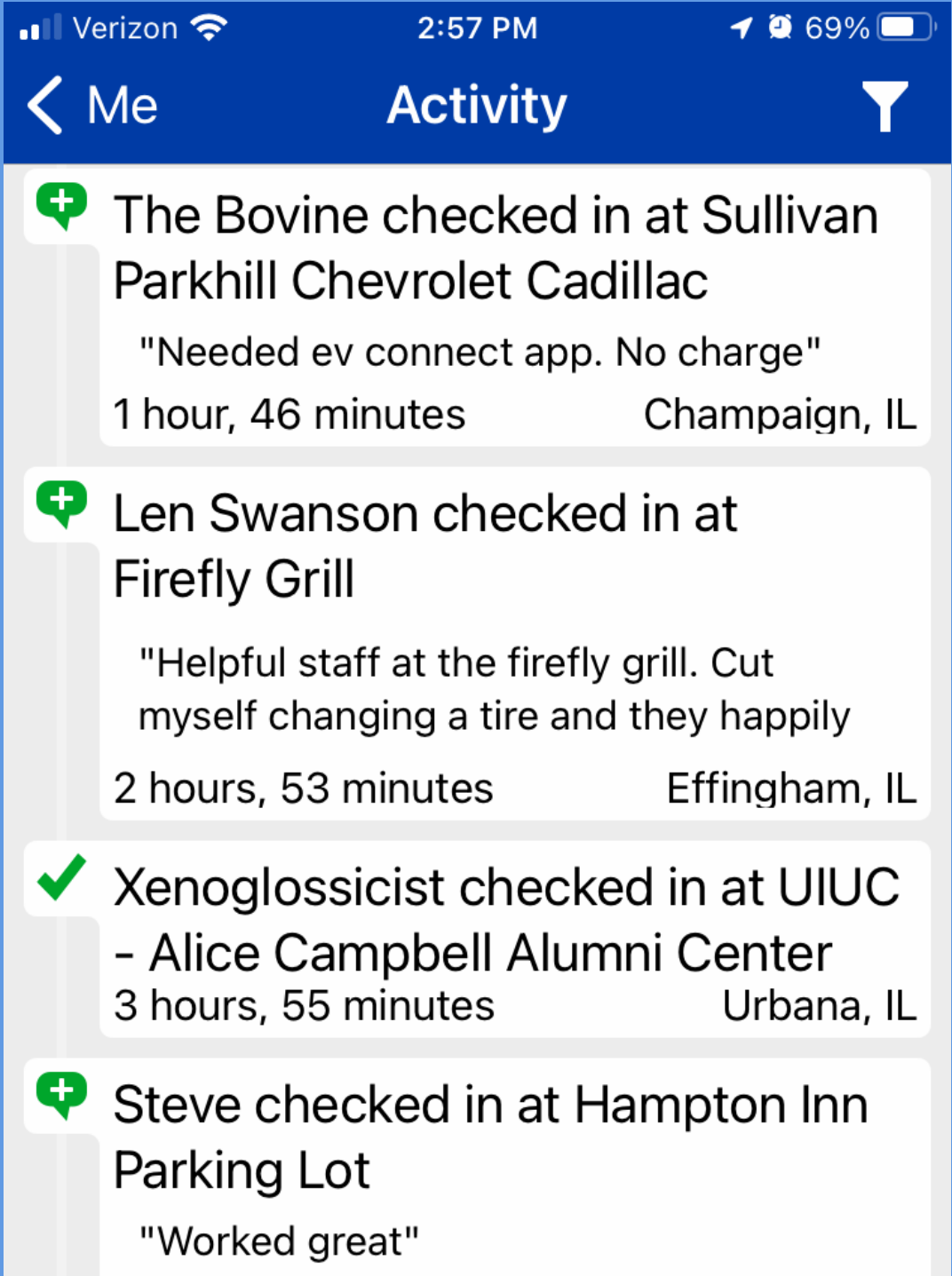
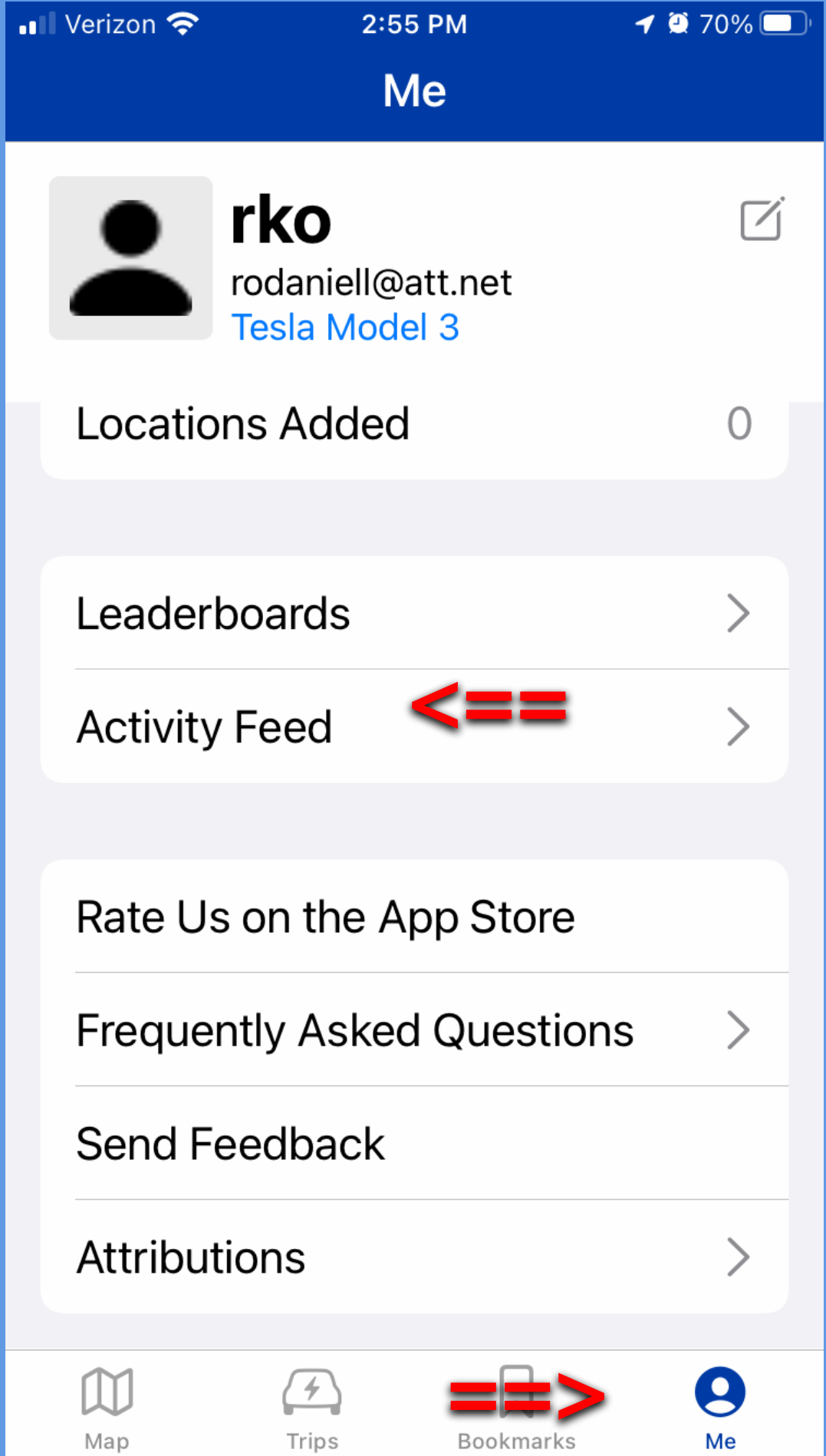


# Electrify America

EA- I find very useful because its the best high speed charging network. Left image the start screen if you're in Champaign, center -My go to location in the Chicago area, right - I like the charging history .



# Session ??: Charger Apps



The "reviews" are checkins posted directly to a specific charger location, in this case the Wally's in Pontiac, still having charger problems.

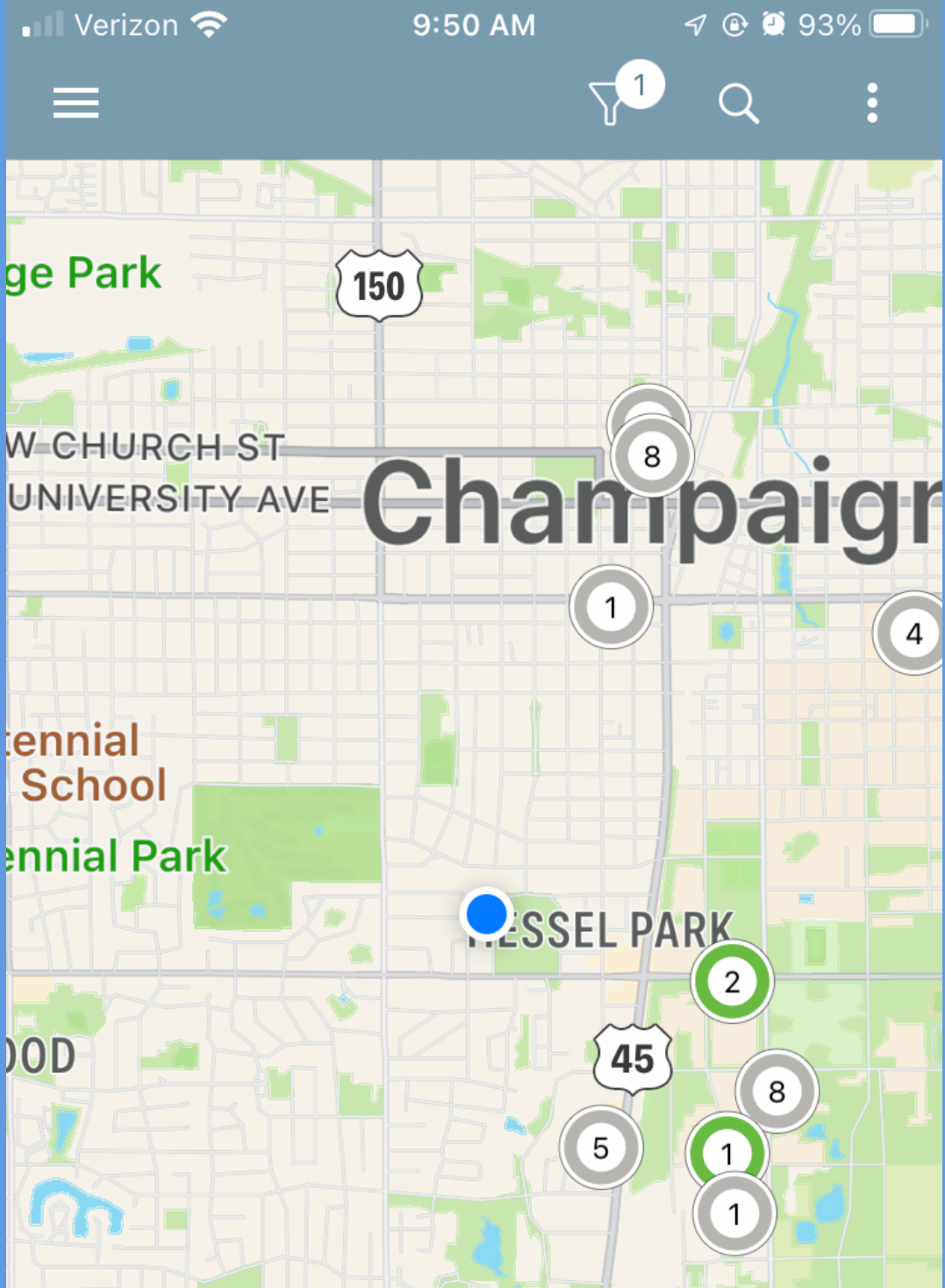
## Plugshare is a crowd source App

EV users locate, comment on, describe, add photos and review public chargers. Click on the "me" at the bottom, then "activity feed" (red arrows) and you will get the most recent checkins from an area within 50 miles or so from your current location.

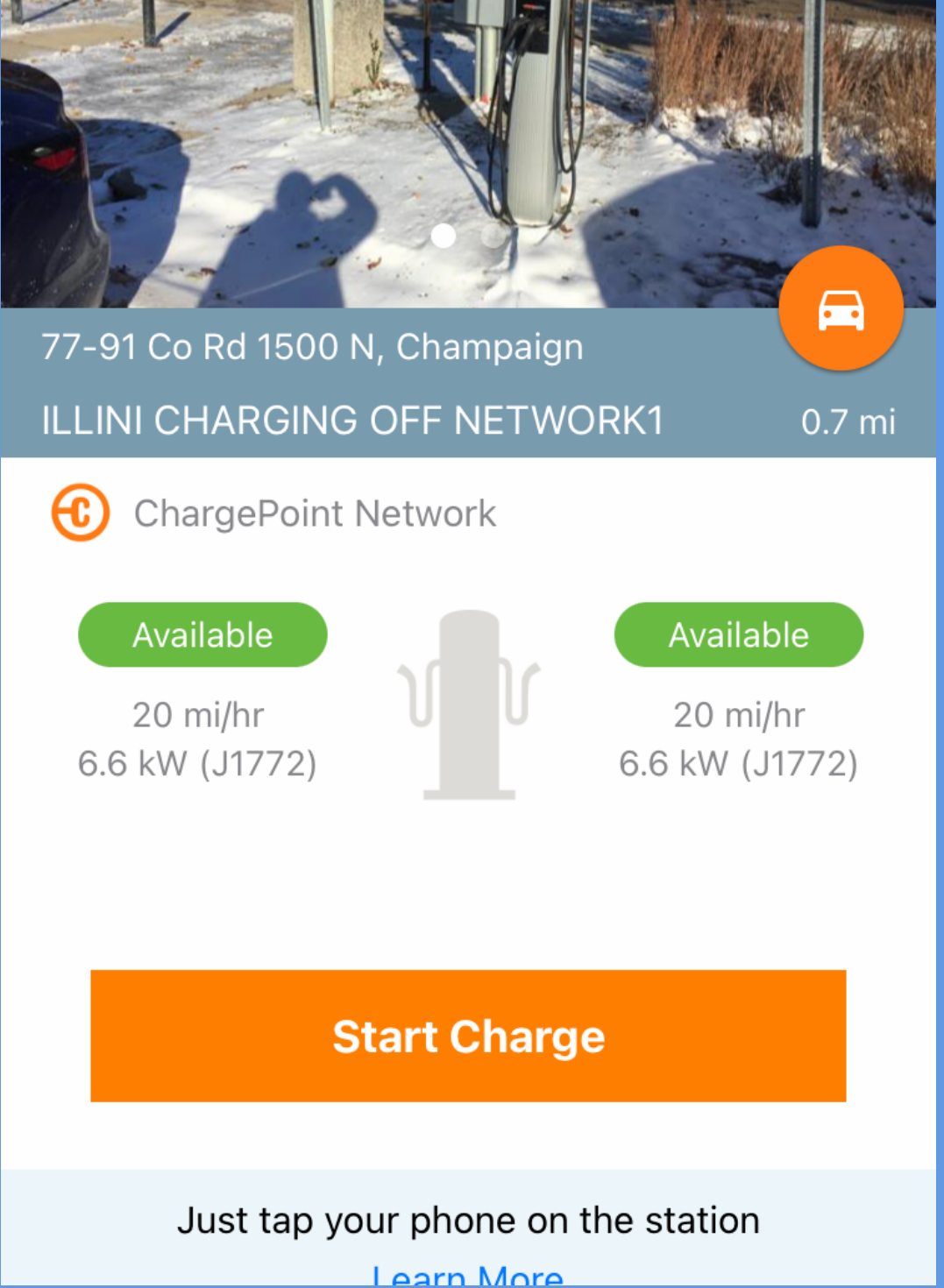
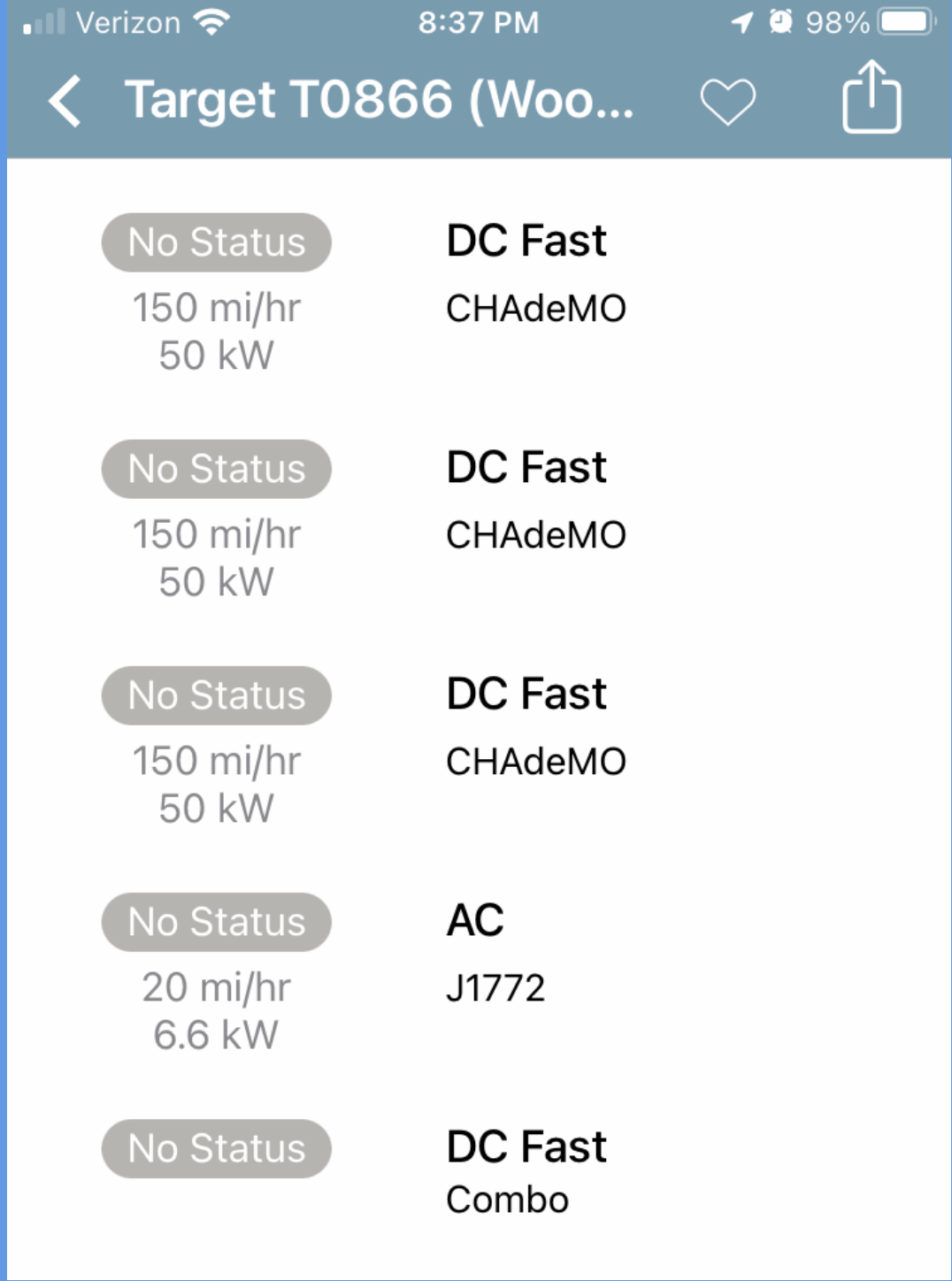
# Plugshare



# Session ??: Charger Apps



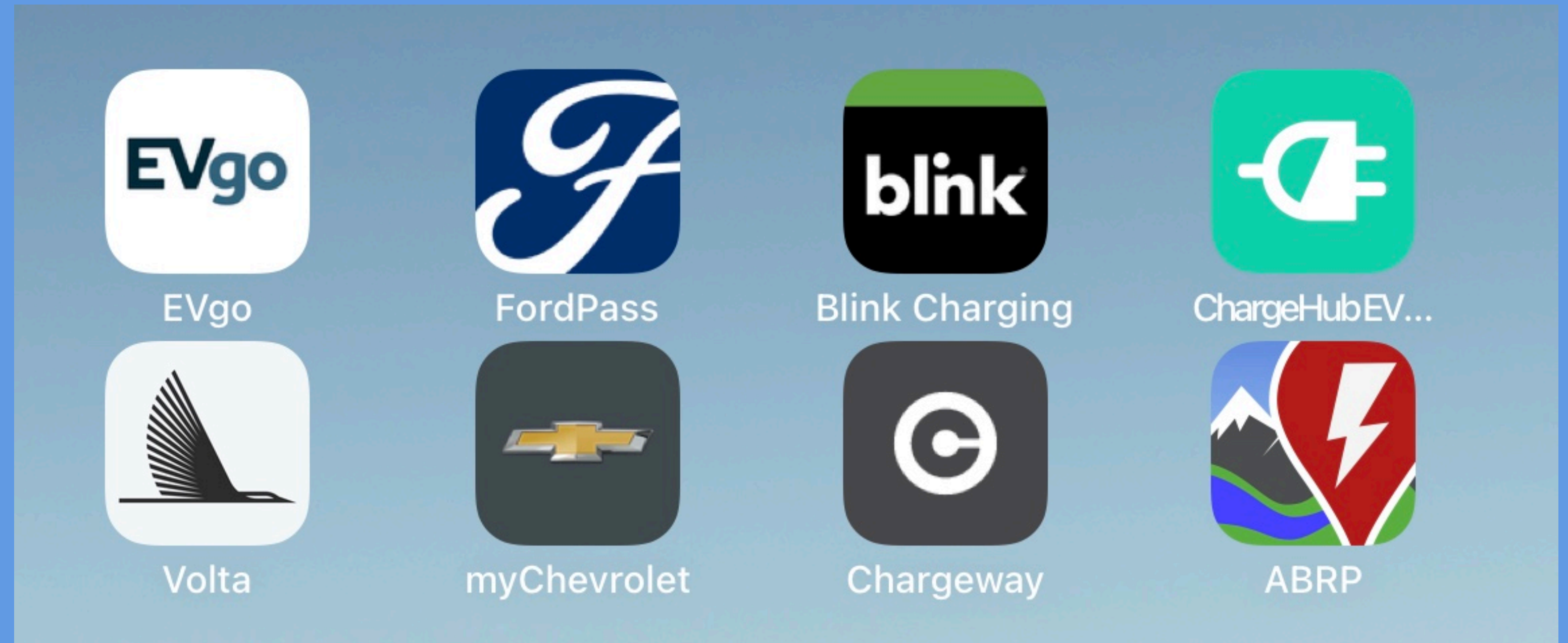
ChargePoint



I don't find very useful except for using the app to when using a charge station (right screen) Left image the "home" screen if you're in Champaign, center - a description of an Electrify America location. I prefer to find Level2 stations with PlugShare , then switch to Chargepoint app if its one of theirs.



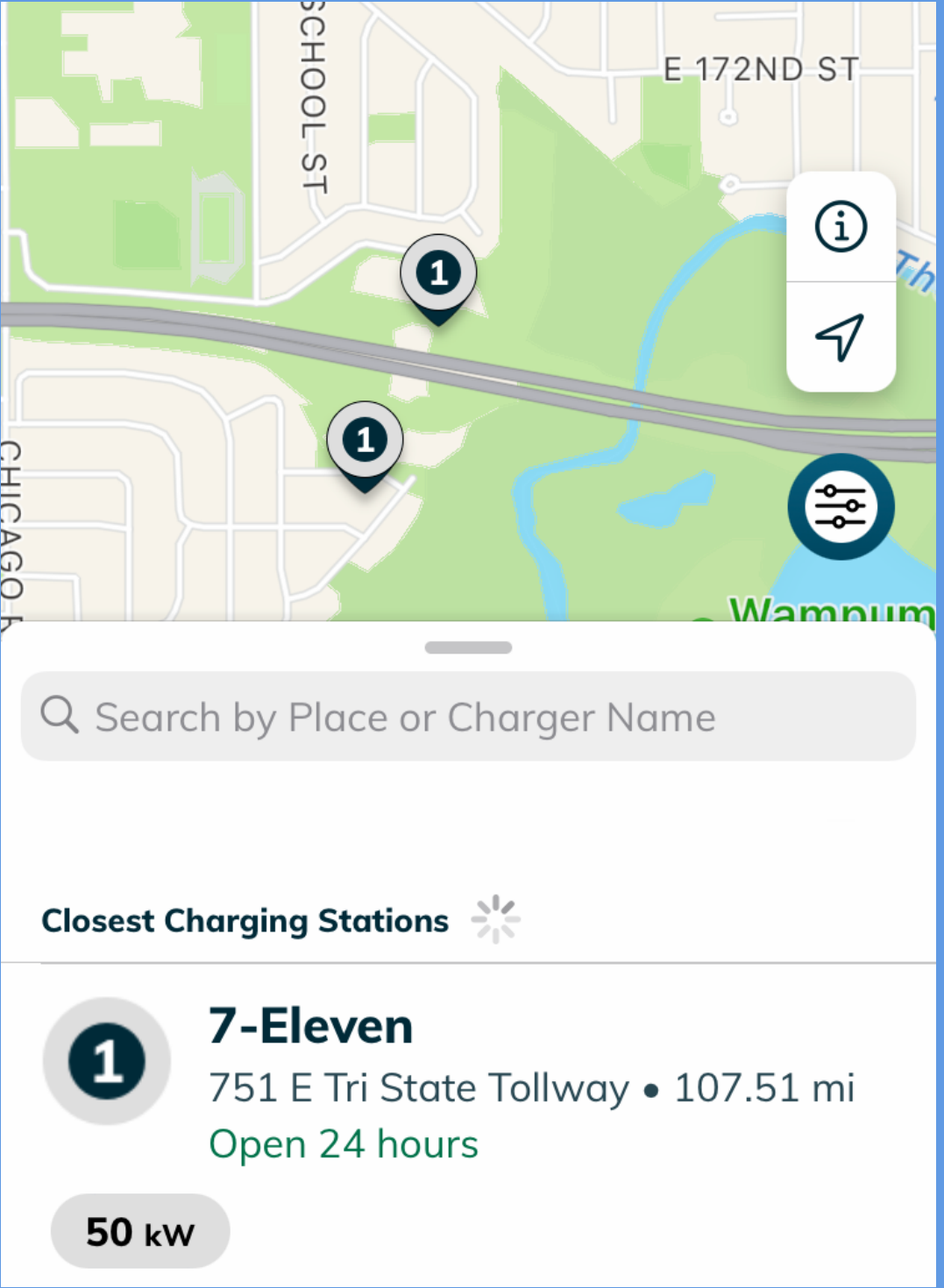
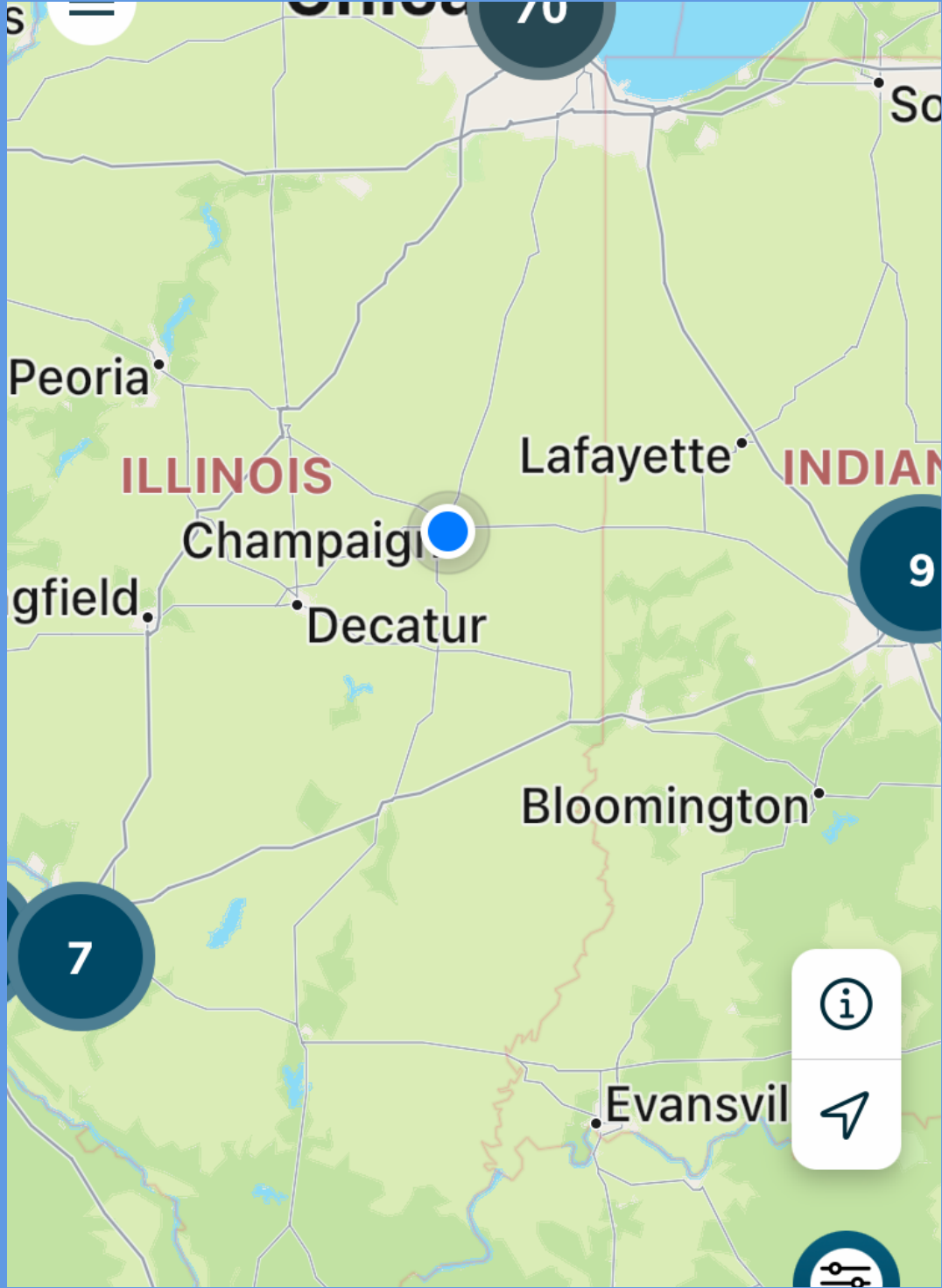
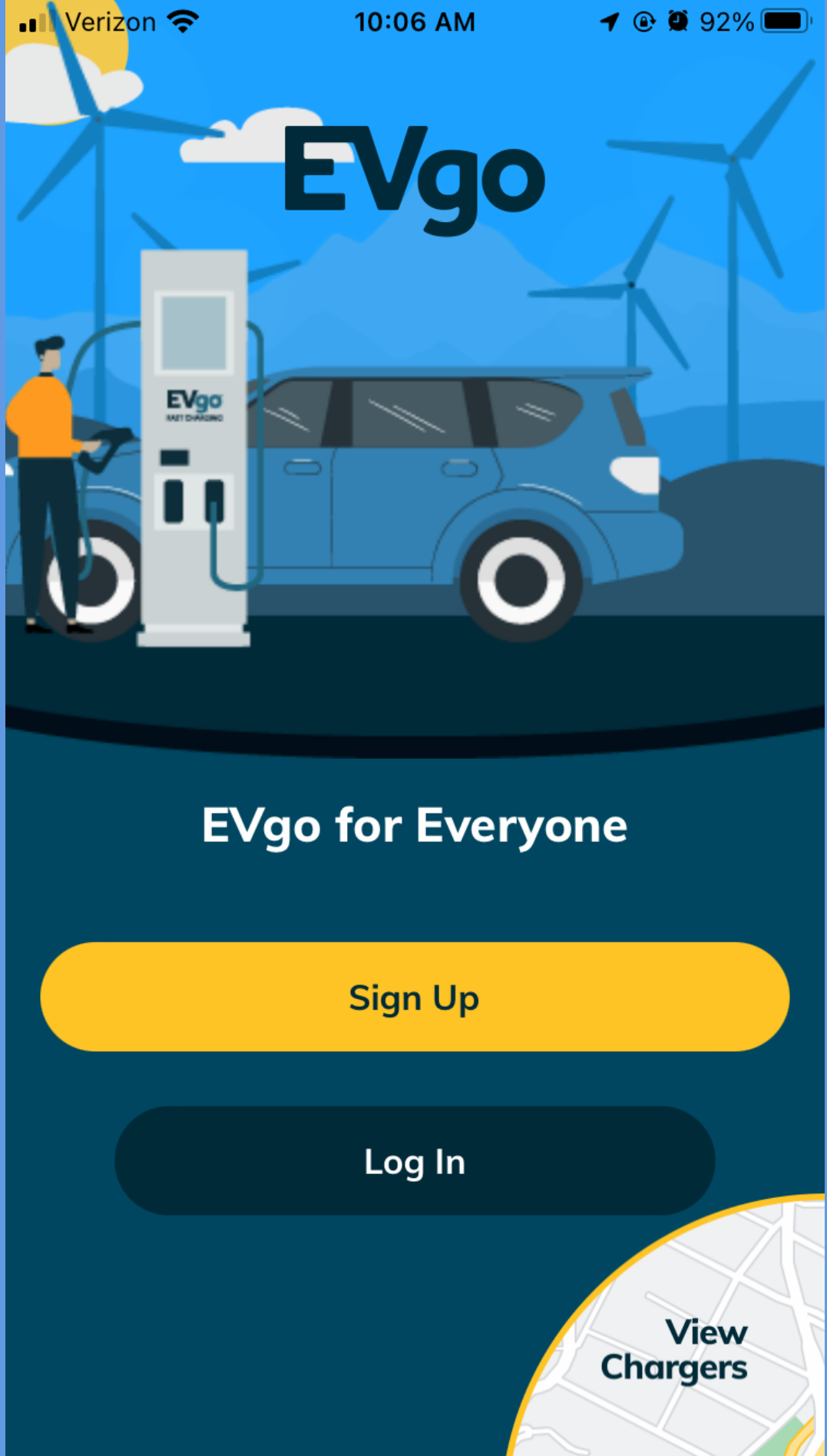
## Session ??: Charger Apps



A quick run-through of the others.



# Session ??: Charger Apps



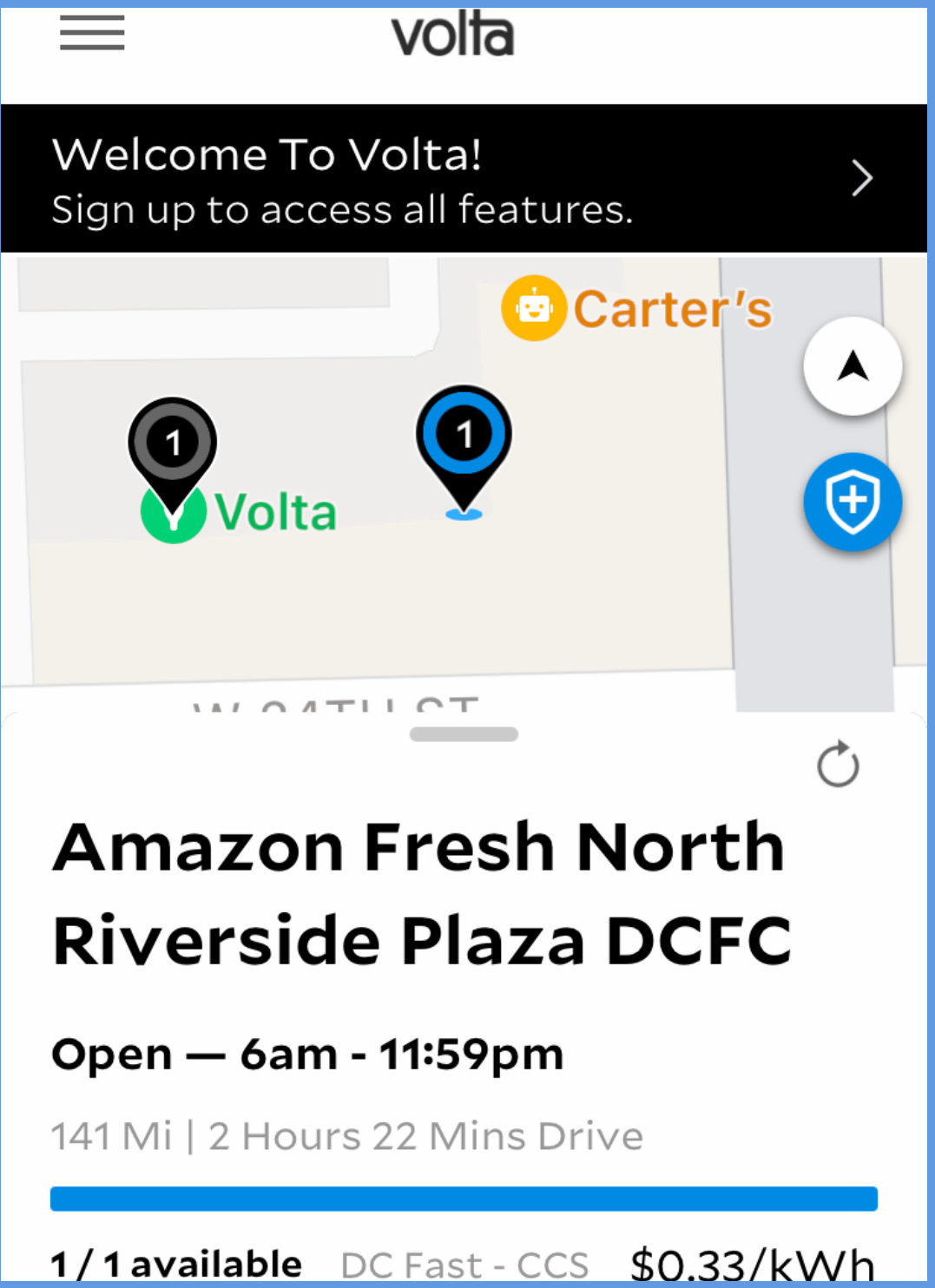
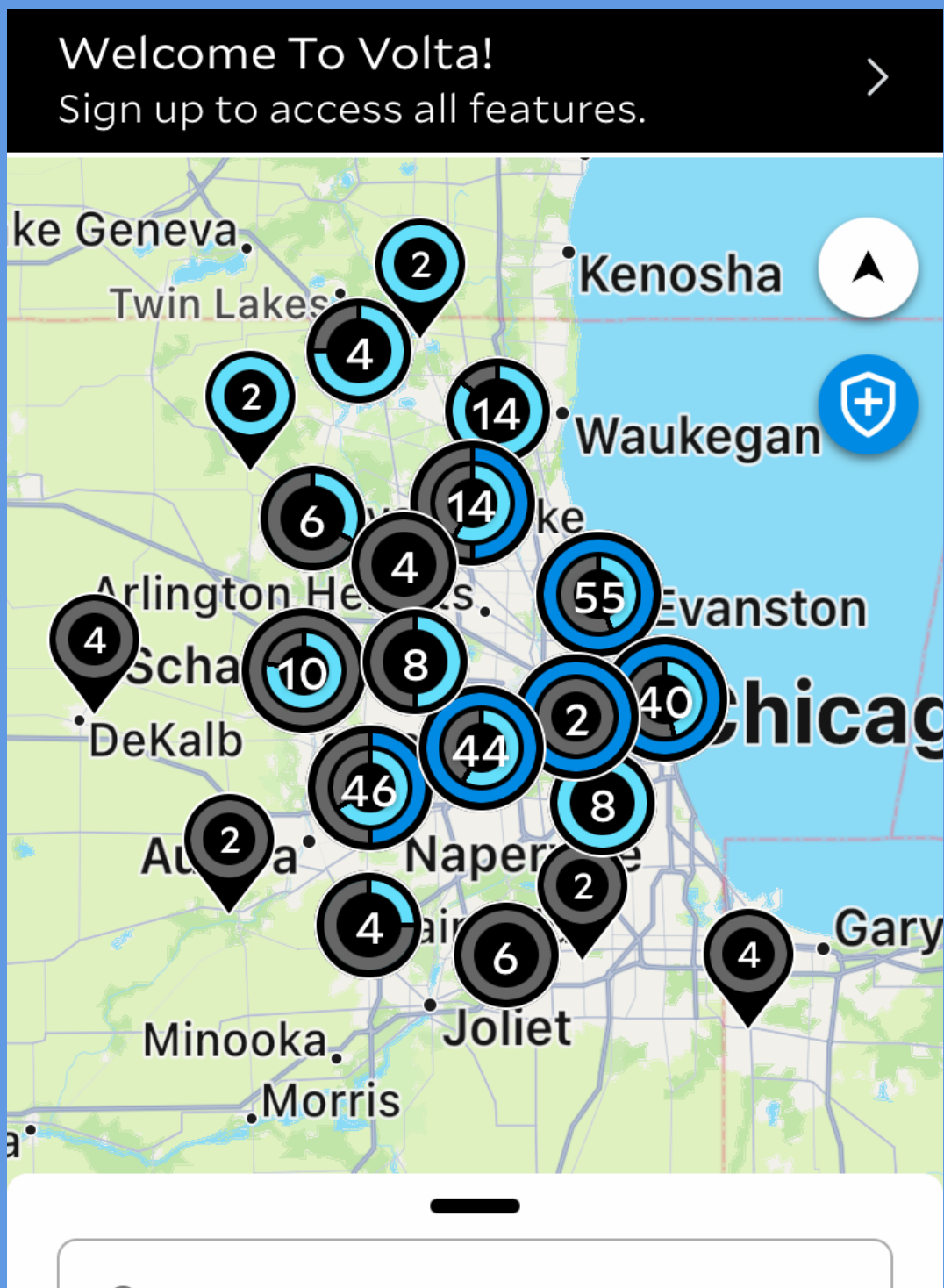
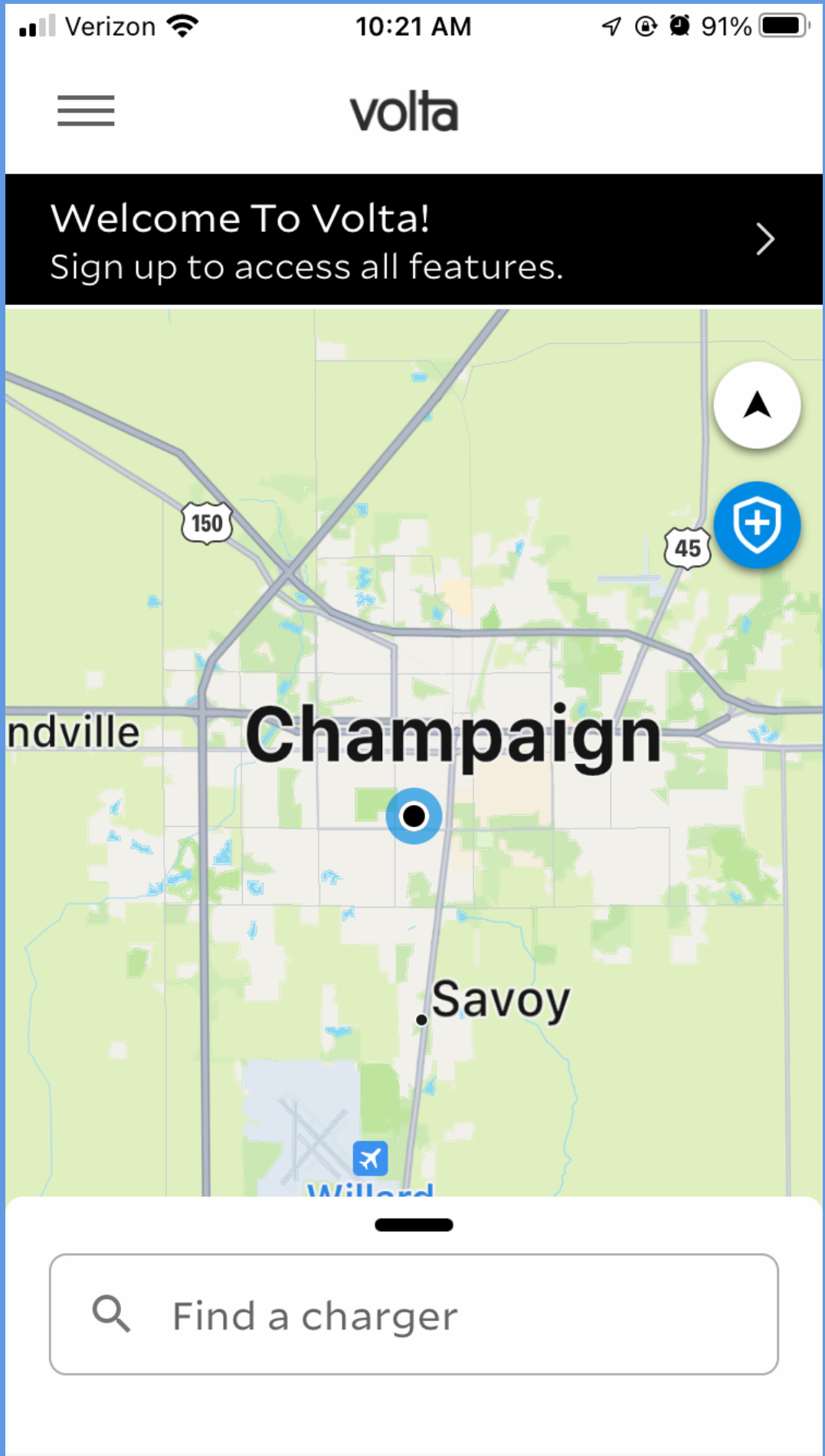
Left image the start screen, center -very few locations in Illinois, right - details of a typical location with only one 50 kw charger.

# EVgo

EVgo used to be somebody - until 2020. Their growth stalled and Electrify America was started with \$2 billion dollars of VW "Dieselgate money". EA rapidly outpaced them with locations with a minimum of 4 150kw chargers. EVgo is just beginning to grow again, adding locations with multiple chargers of 150 and 350 kw.



# Session ??: Charger Apps

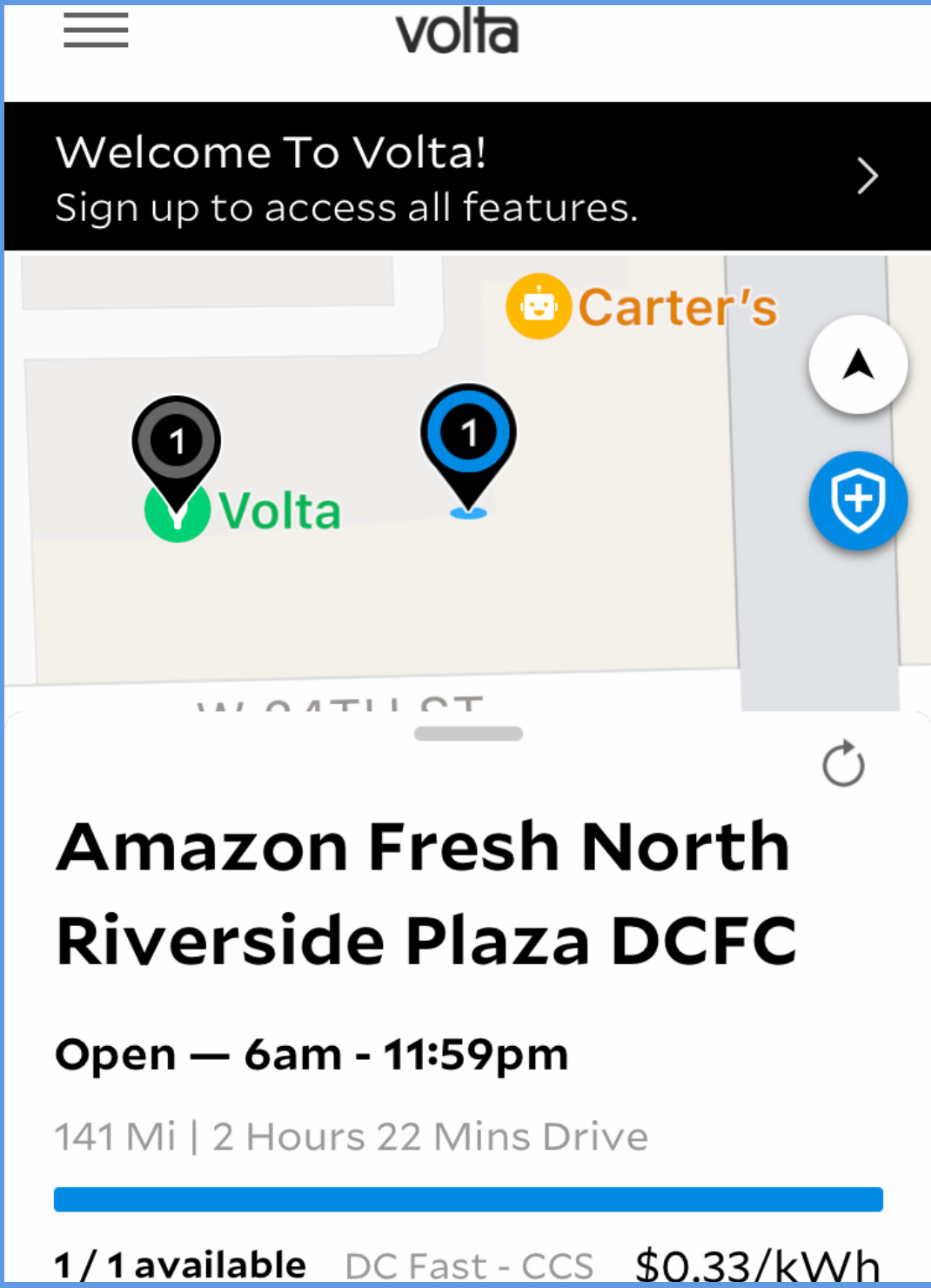
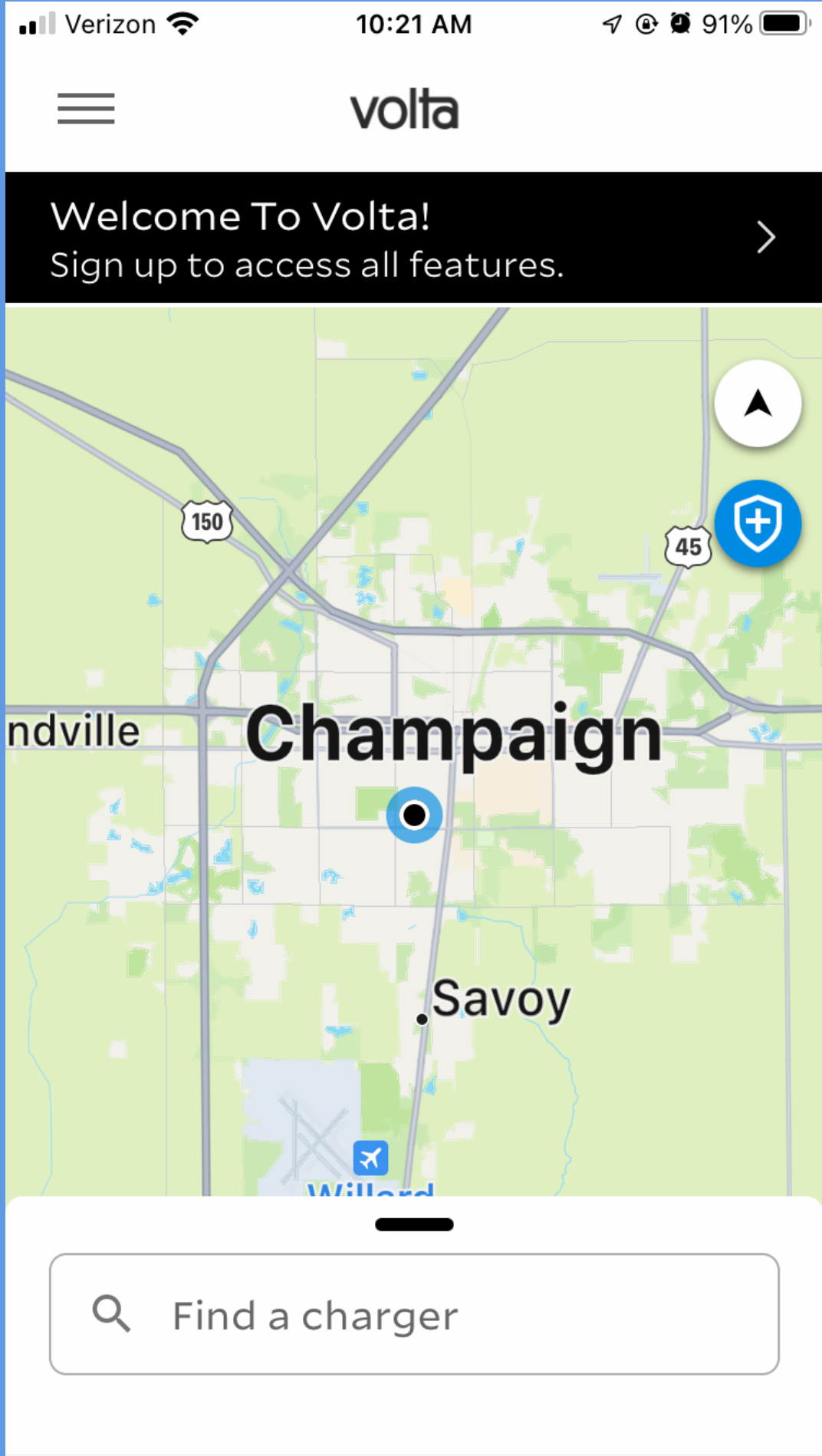


Mostly level 2 chargers that are FREE. They approach shopping sites, install chargers free to the stores, let EV drivers charge for free and make all of their money advertising on the Charger cabinet. Branching into DCFC, but those have a fee.

# Volta



# Session ??: Charger Apps



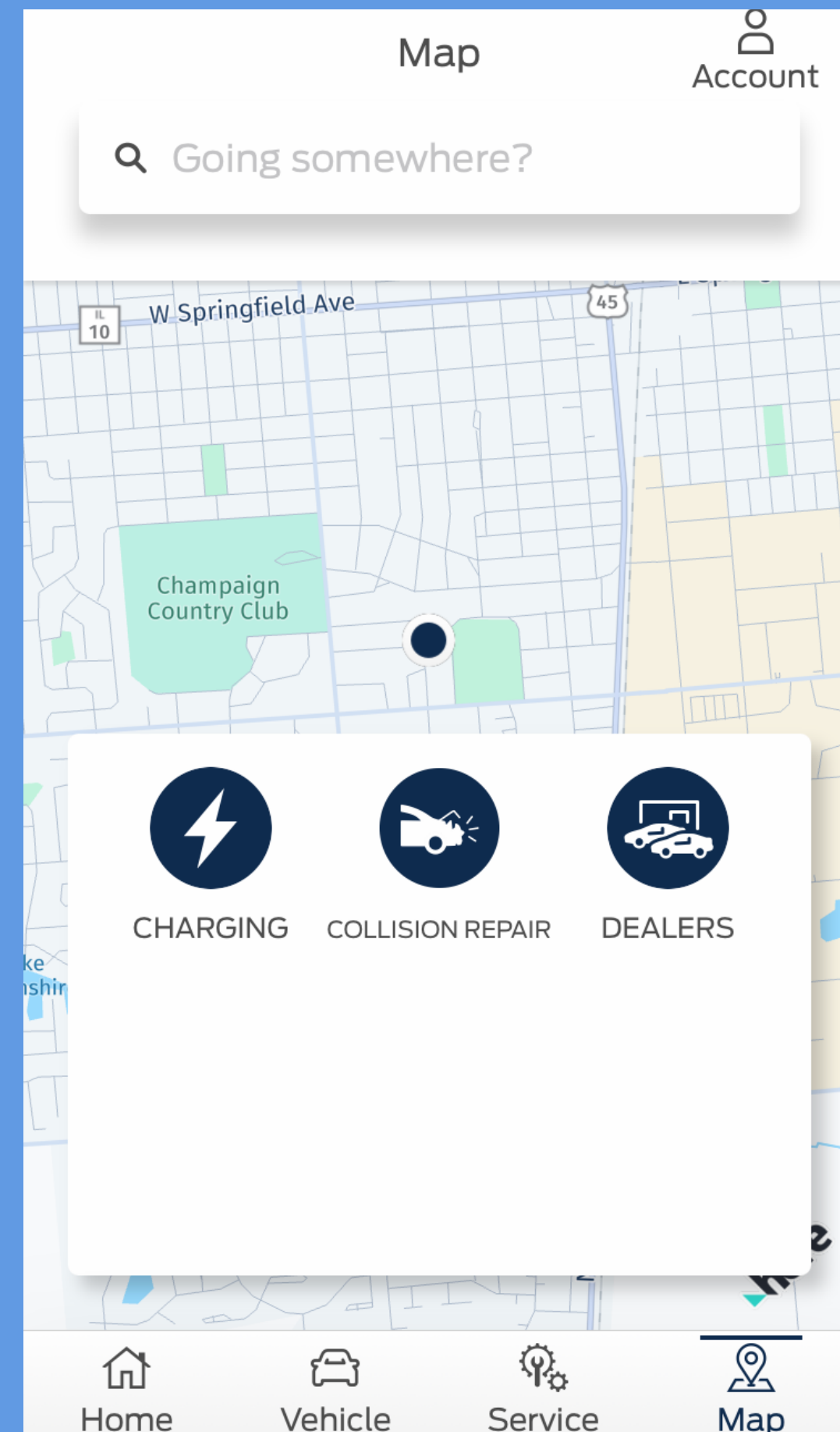
Left image the start screen, , center -Chicago locations, right - details of a location with DCFC charger. Volta DCFC are usually between 50-100 kw.

# Volta

I LOVE Volta - I bought some stock, lost 90% of my money. Excellent charging experience, excellent business plan. Made every prudent long term move and the stock market hammered them. They deliberately slowed growth to wait for Jan 1st federal money.



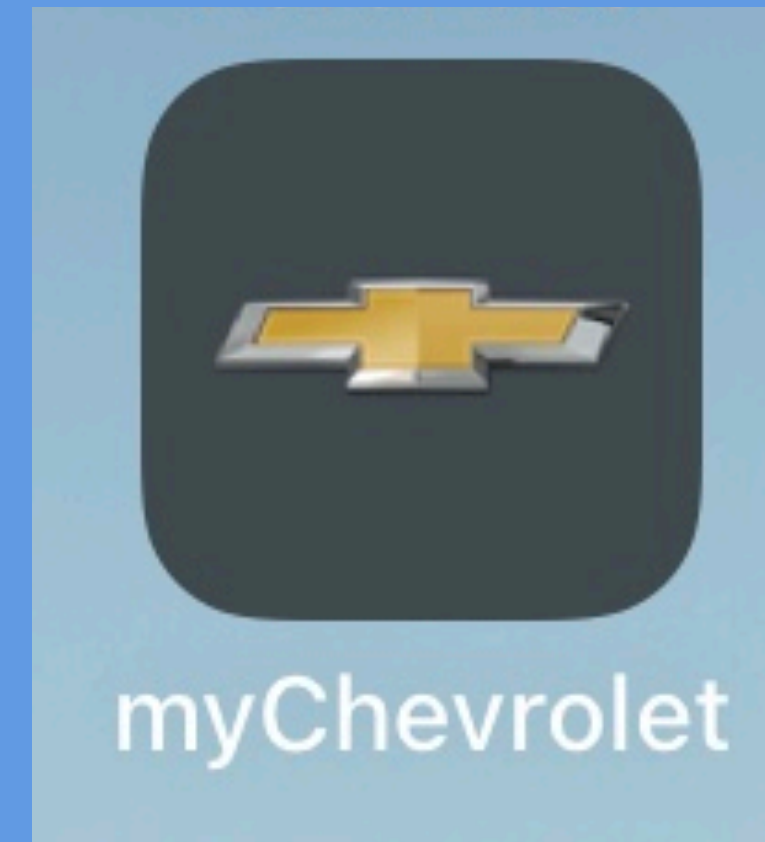
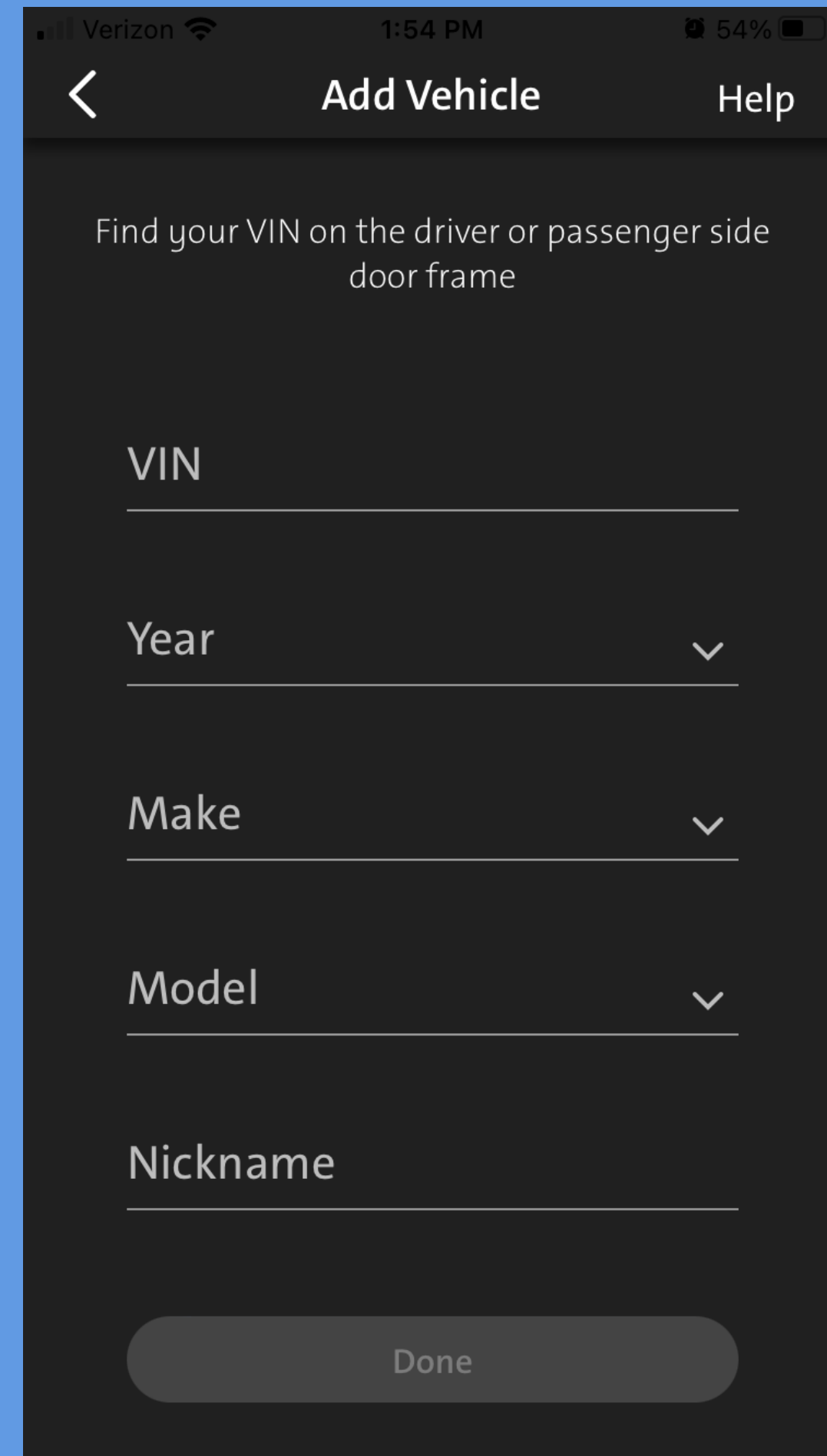
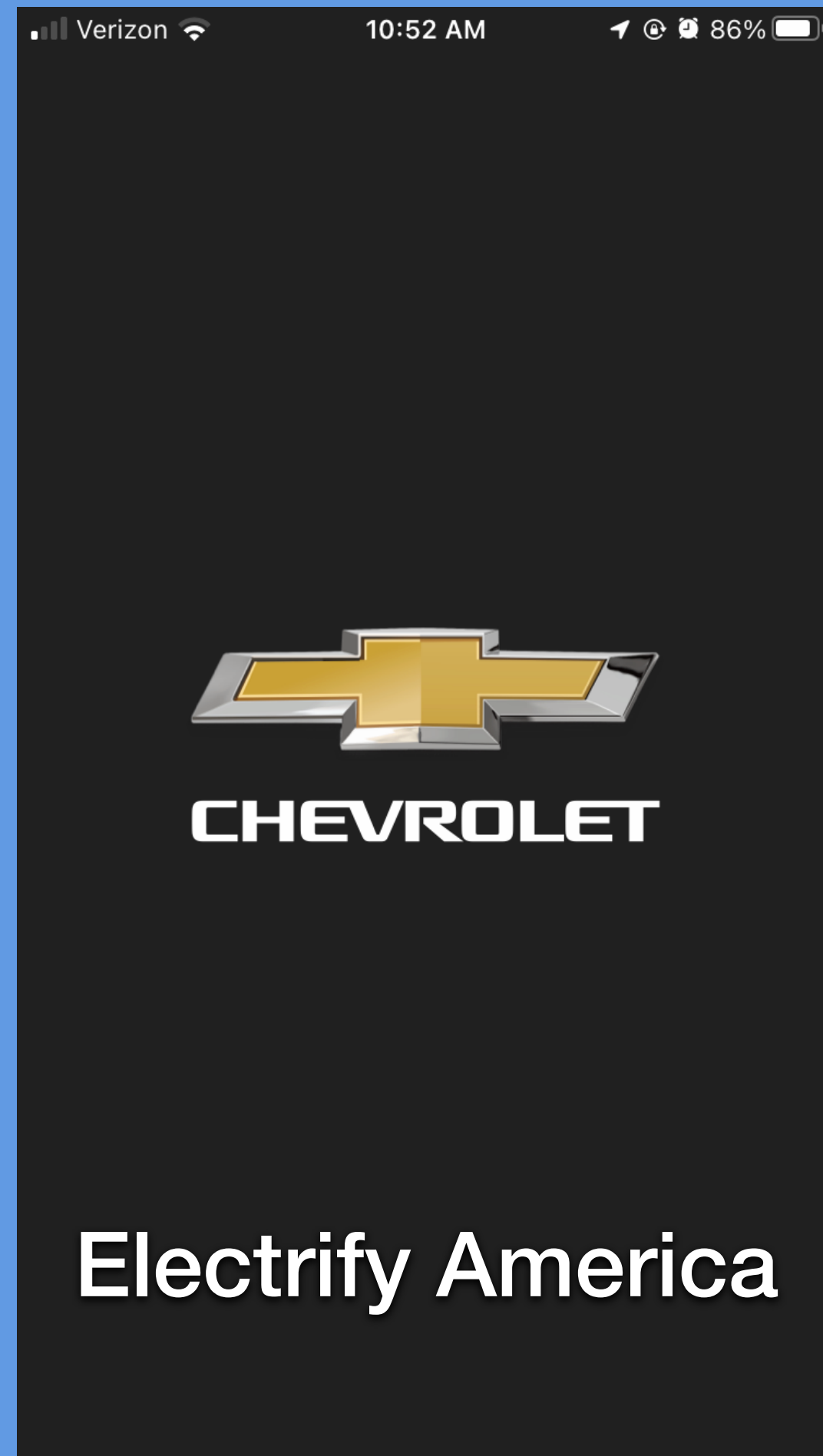
# Session ??: Charger Apps



Its an app aimed at Ford owners. It has links to services other than charging. Ford does not have a network. When companies like them claim and name a network, almost always it is a partnership with actual charging networks.



# Session ??: Charger Apps



Chevy an app is so aimed at Chevy owners you need a VIN to sign up.

Ford and Chevy apps are likely mediocre at finding chargers. Dedicated apps do a better job of giving information about the chargers and allow better decisions to be made.



## Session ??: Charger Apps

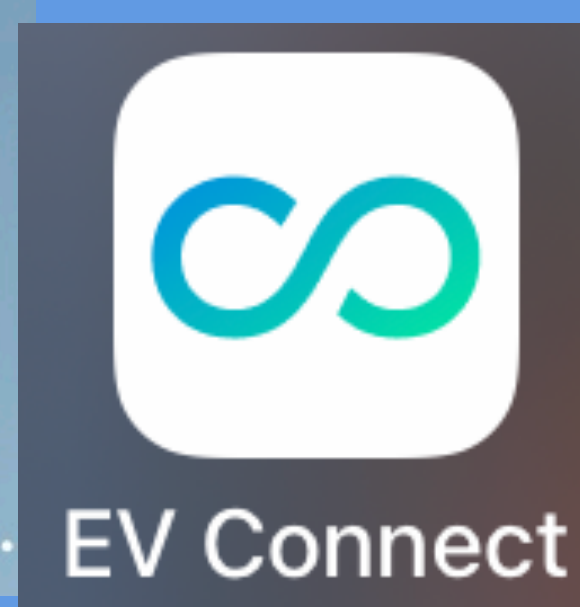
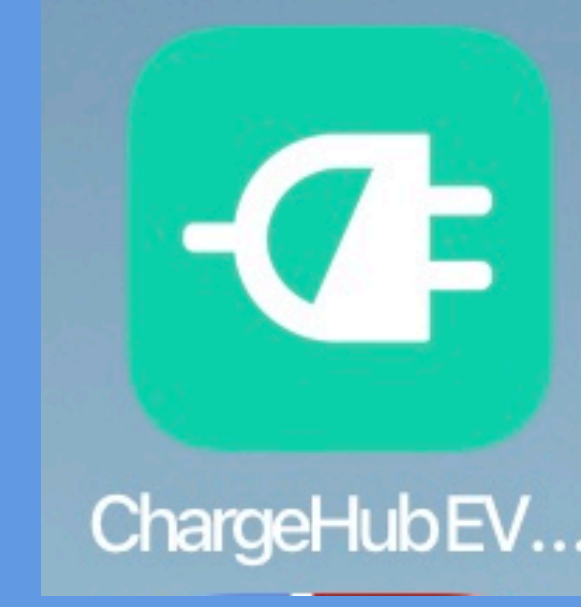
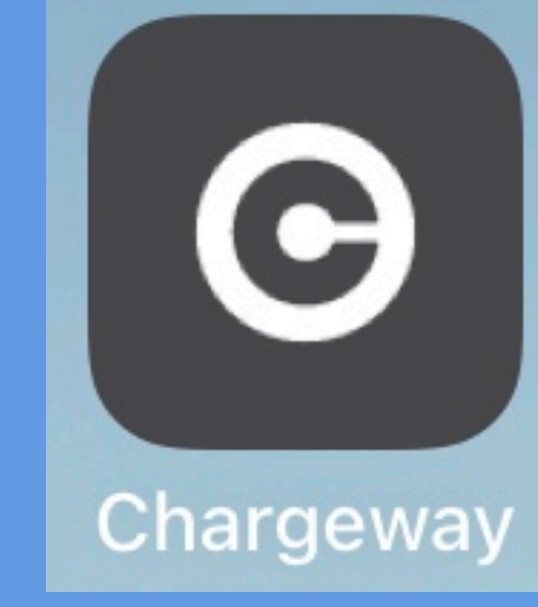


I mentioned before that Blink charger fees are high. Blink would be my last choice for a charger.

But sometime it might be the only charger. If so consider signing up on the app to get discounted fees.



Shell is starting a program to install DCFC at gas stations. App call ShellReCharge. Charging network is Greenlots renamed. Planning installation of 500,000 chargers by 2025. Currently this app has little use (IMO)



ABRP ( a better route planner) ; Chargeway; EVConnect; and ChargeHubEV. Primarily early attempt to make route planning easier. Interesting concept - try them. I personally will do most of my planning with Electrify America and use PlugShare to fill in the gaps. Both work quite well on the dining room table with a cup of coffee. (Or at a coffee shop)