

A Better Route Planner Basics

This tutorial gives the basics of trip planning in “A Better Route Planner” (www.abetterrouteplanner.com). It includes the steps for setting up your account along with advice for defaults to use, as well as a hypothetical trip from home (1600 Pennsylvania Ave) to a destination (The liberty Bell) and back, requiring a charge as well as an overnight stay. It therefore incorporates all the recommended techniques that would be used for a much longer trip, as well as suggestions for making trips smoother as well as highlighting a few painful quirks in the application. The screenshots included are from the web application **version 4.1.10**. I recommend using a computer with a monitor resolution of at least 1920x1080 in order to see all of the content; on lower resolution monitors things like the “table view” are not available.

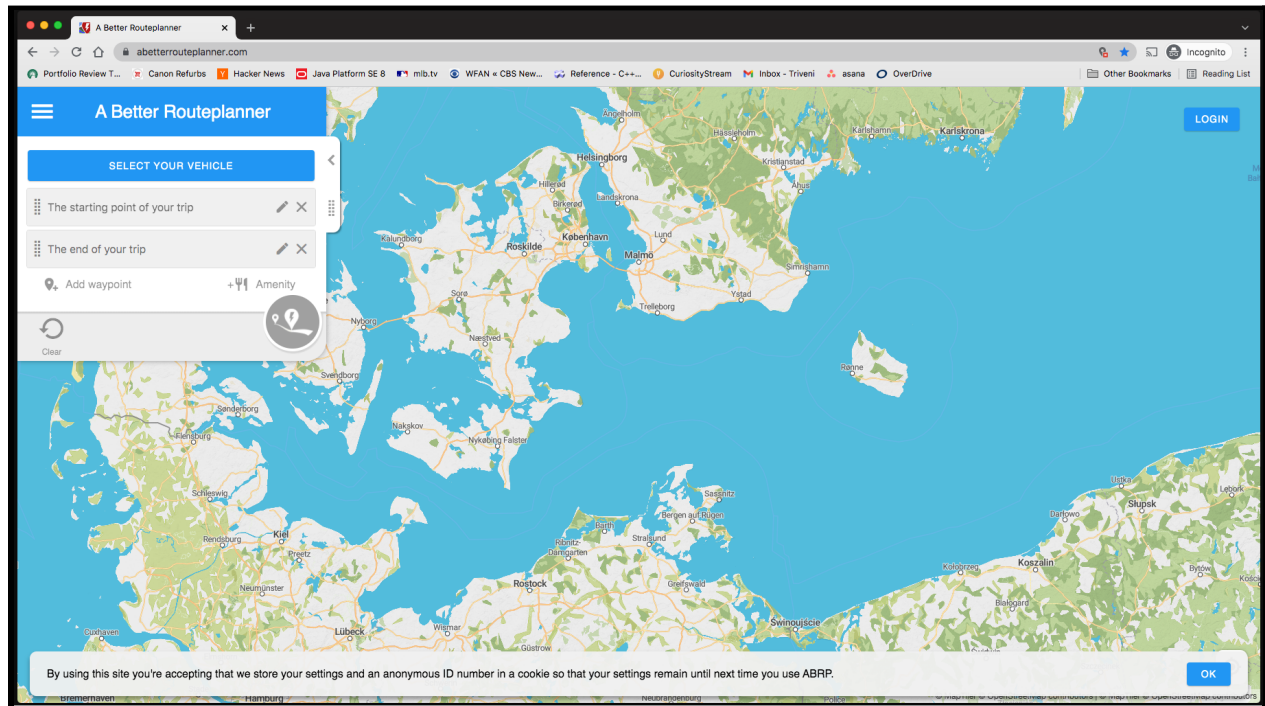
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Last Updated: Dec 19, 2021


Initial Setup

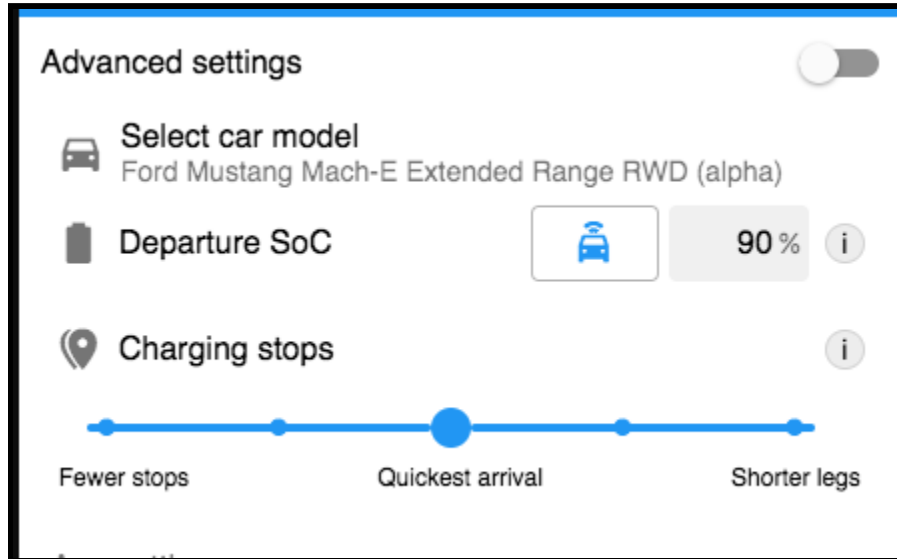
The first time you go to the [ABRP](https://abetterroutepanner.com) website, you get a welcome screen prompting you to login or create an account. I highly recommend at least creating a free account to start so that you may save your plans and edit them as necessary. If you like it then buy a premium subscription.



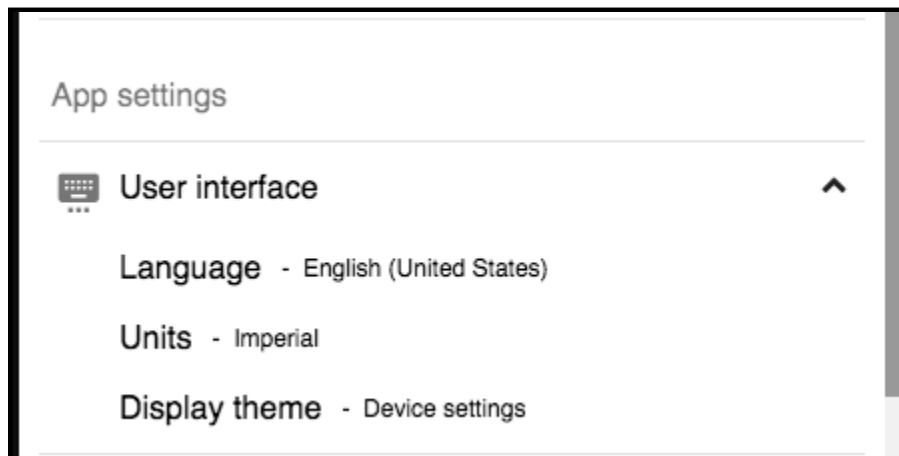
1. Click the “LOGIN” button in the upper right, which gives you the option to create an account or login with an existing one. In the login dialog box click “create an account”:

A screenshot of the ABRP login dialog box. It has a white background with a blue border. At the top, the word 'Login' is centered in a large black font. Below it are two input fields: 'Email' and 'Password'. Under these fields is a large blue button labeled 'LOGIN'. Below that are two smaller buttons: 'LOGIN WITH ABRP APP' (with an app icon) and 'CORPORATE LOGIN' (with a company icon). Further down are two social media login buttons: 'FACEBOOK' (with the Facebook 'f' logo) and 'GOOGLE' (with the Google 'G' logo). At the bottom, there is a button labeled 'CREATE AN ACCOUNT' and a link labeled 'FORGOT YOUR PASSWORD?'.

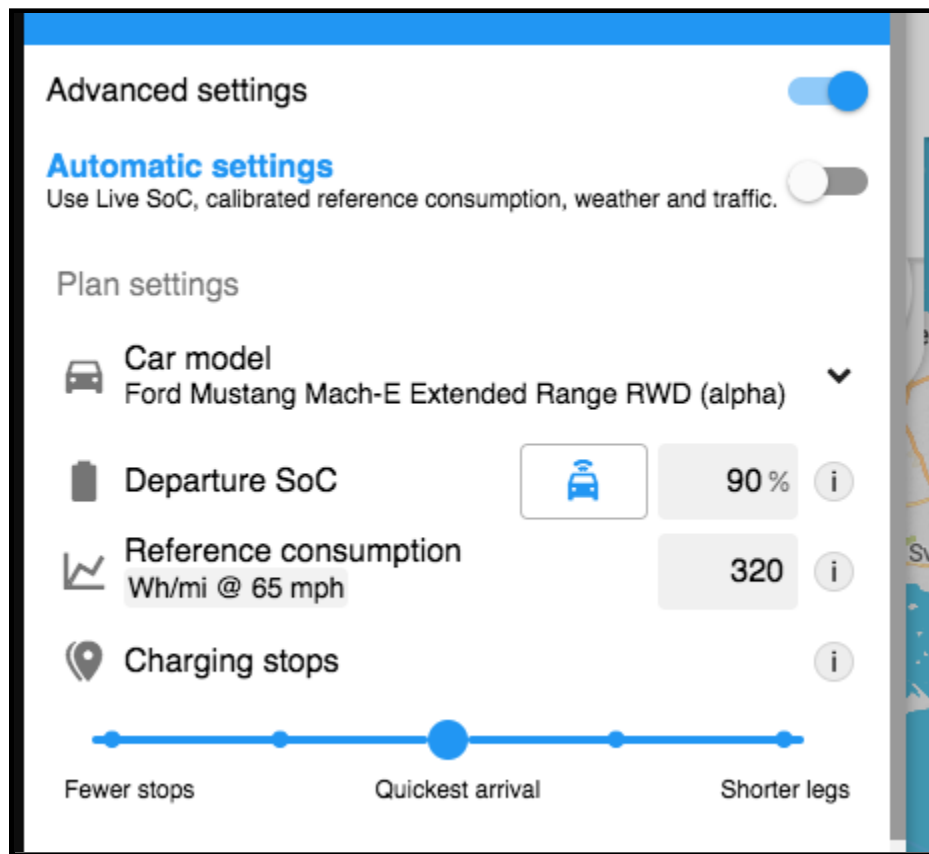
2. After creating your account and logging in, you need to select your vehicle in the upper left. For the purposes of this tutorial, I selected Mach-E Extended Range Rear Wheel Drive. Note that all of the Mach-E's have "alpha" next to them; that is OK as ABRP hasn't gotten a lot of feedback on the car's actual performance. The consequence of that is that ABRP tends to be conservative with efficiency and charging speed.
3. Go into the settings menu by clicking the settings button  in the upper left, which will bring up the basic settings menu by default:



4. I recommend first setting the language and units so the rest of the steps are in those familiar units. Scroll down to "User Interface", open it, and set those items for your locale. For the USA:

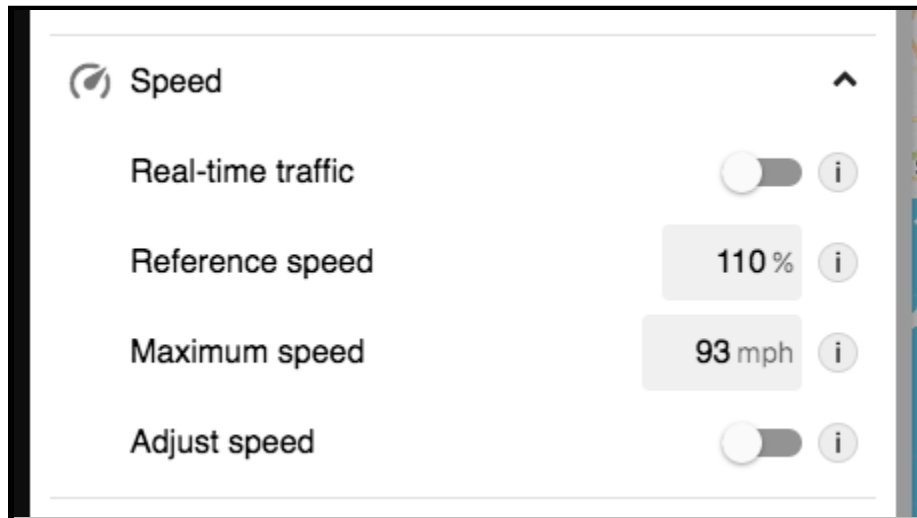


5. To properly configure ABRP, enable the “Advanced Settings” toggle at the top of the settings, which allows you to specify the “reference consumption” and other variables that configure the trip planner:

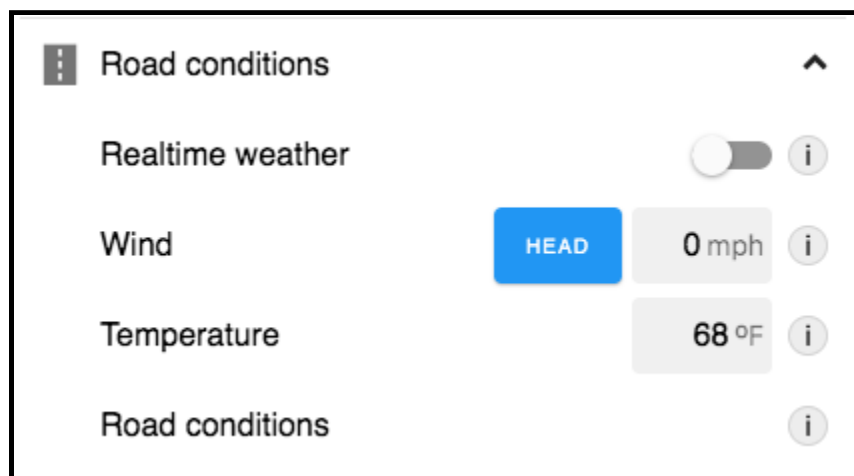


6. By default ABRP displays efficiency in the Tesla-style wh/distance format; to change that to distance/kwh click the “wh/mi” text and it will toggle to the “mi/kwh” format Ford and others use. By default ABRP is conservative with the Mach-E and rates it less efficient than it really is. For my Route 1 which is RWD with 18” wheels my base efficiency at 65mph is 3.5 mi/kwh. For 19” wheels on a Premium RWD I would suggest 3.4, and 3.1 for a premium AWD. For Selects with 18” wheels I would use 3.5 and 3.2 for RWD/AWD respectively.

7. Speed has a large effect on efficiency, and thus ABRP gives several configuration options. Therefore, you can configure how much over or under the speed limit you intend to drive (“reference speed”), and whether you will allow it to adjust your speed below the “reference speed” in order to make the charging destination if there is too much distance between available chargers.



8. If weather conditions are known, set them in the “Road Conditions” drop down. For this reason it is a very good idea to recalculate your plan a few days before going on the trip to ensure that updated conditions are available.



Exit the Settings Menu by clicking



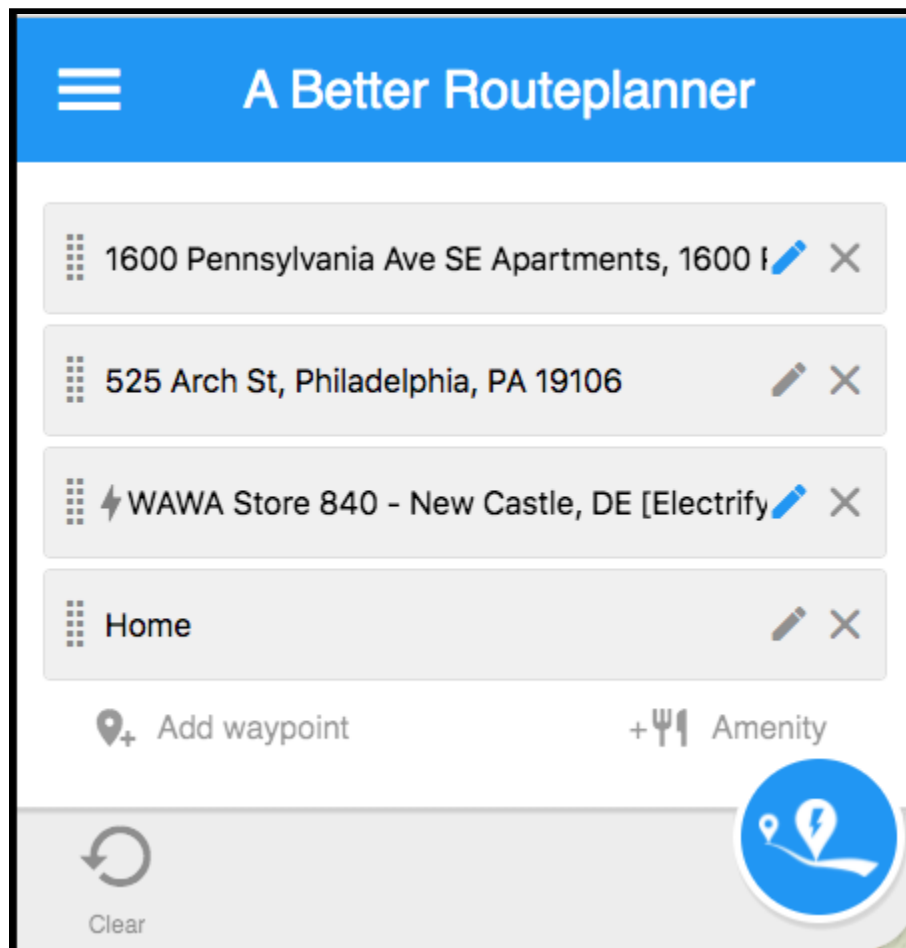
Navigating The UI

The User Interface can be a little confusing at first because the contents and format of the panel in the upper lefthand corner where you add and edit the waypoints changes slightly depending upon what “edit mode” you are in. I don’t know what ABRP calls the 2 different modes/views but for purposes of this tutorial I will call them “waypoint list” and “plan details”.

To exit the plan details view and edit the waypoint list, click the “restart” button in the lower left. Be careful that you are not already on the “waypoint list” view because the same icon is labeled “clear” on the “waypoint list” view and is used to clear the entire plan. Note the 2 different buttons below:



Below are examples of the 2 views with the “waypoint list” first and “plan details” second:



Waypoint List View



A Better Routeplanner

4 h 45 min (275 mi)

🚗 4 h 25 min ⚡ 20 min - One charge



1600 Pennsylvania Ave SE Apartments, 1600

🕒 12:45 PM

🔋 100%

2 h 8 min (137 mi)



525 Arch St, Philadelphia, PA 19106

2 h 8 min (137 mi) from 1600 Pennsylvania Ave SE Apartments

🕒 02:53 PM

🔋 51%

38 min (33 mi)



WAWA Store 840 - New Castle, DE [Electrify]

58 min (33 mi) from 525 Arch St

➤ 🕒 03:31 PM → 03:51 PM (20 min)

🔋 40% → 70%

1 h 39 min (106 mi)



Home

1 h 39 min (106 mi) from WAWA Store 840 - New Castle

🕒 05:30 PM

🔋 32%

📍+ Add waypoint

+🍴 Amenities



Restart



Share



Save



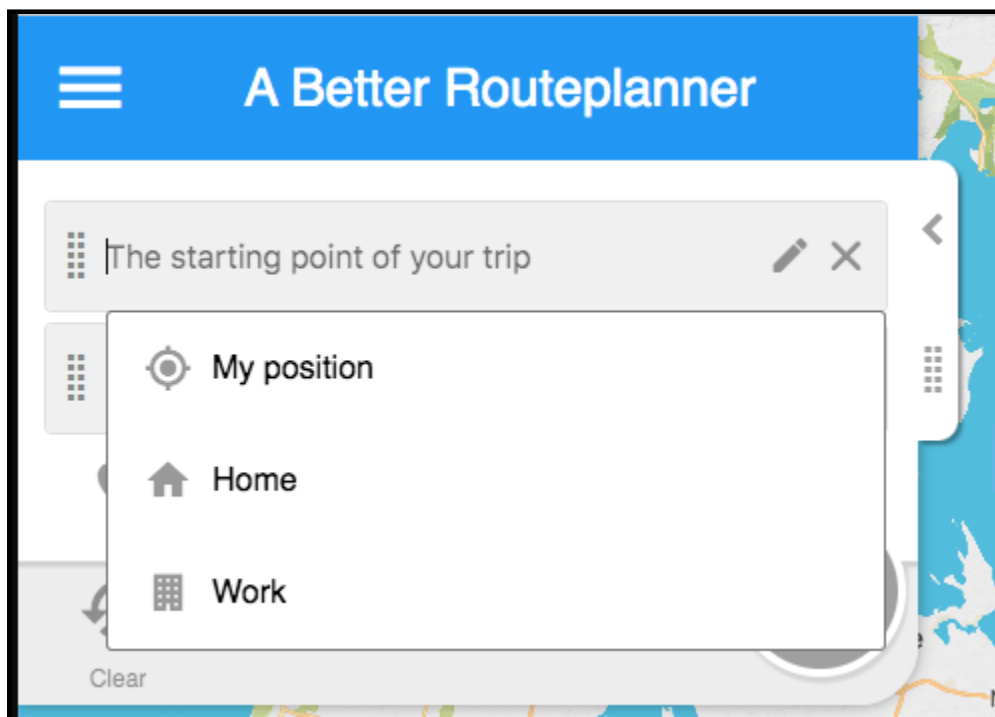
Plan Details View

Beginning A Trip

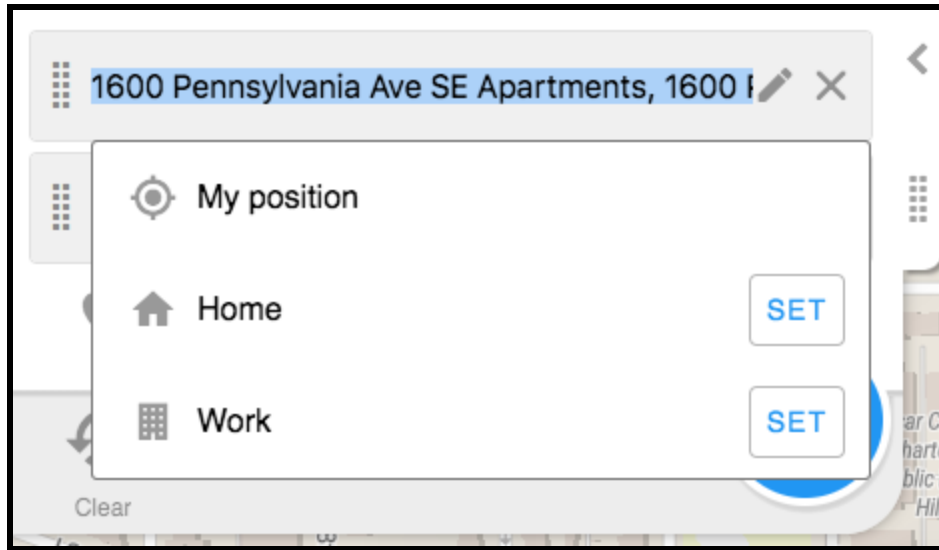
If you haven't planned a trip before, the list of waypoints will be empty. If ABRP is currently showing the previous trip you planned, you can clear the list of waypoints by clicking the "clear" button:



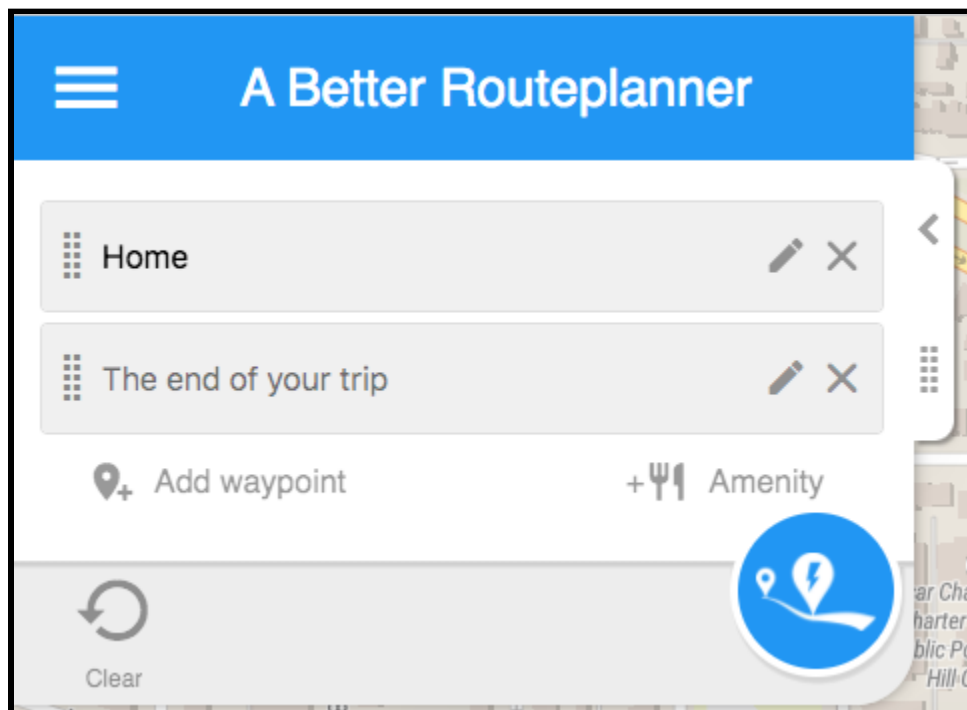
1. To begin entering the waypoints for a trip, click the first waypoint, and it will bring up the list of known waypoints as well as the choice of "my position", "Home", and "Work". Since you have not set the "Home" and "Work" addresses yet they will be blank:



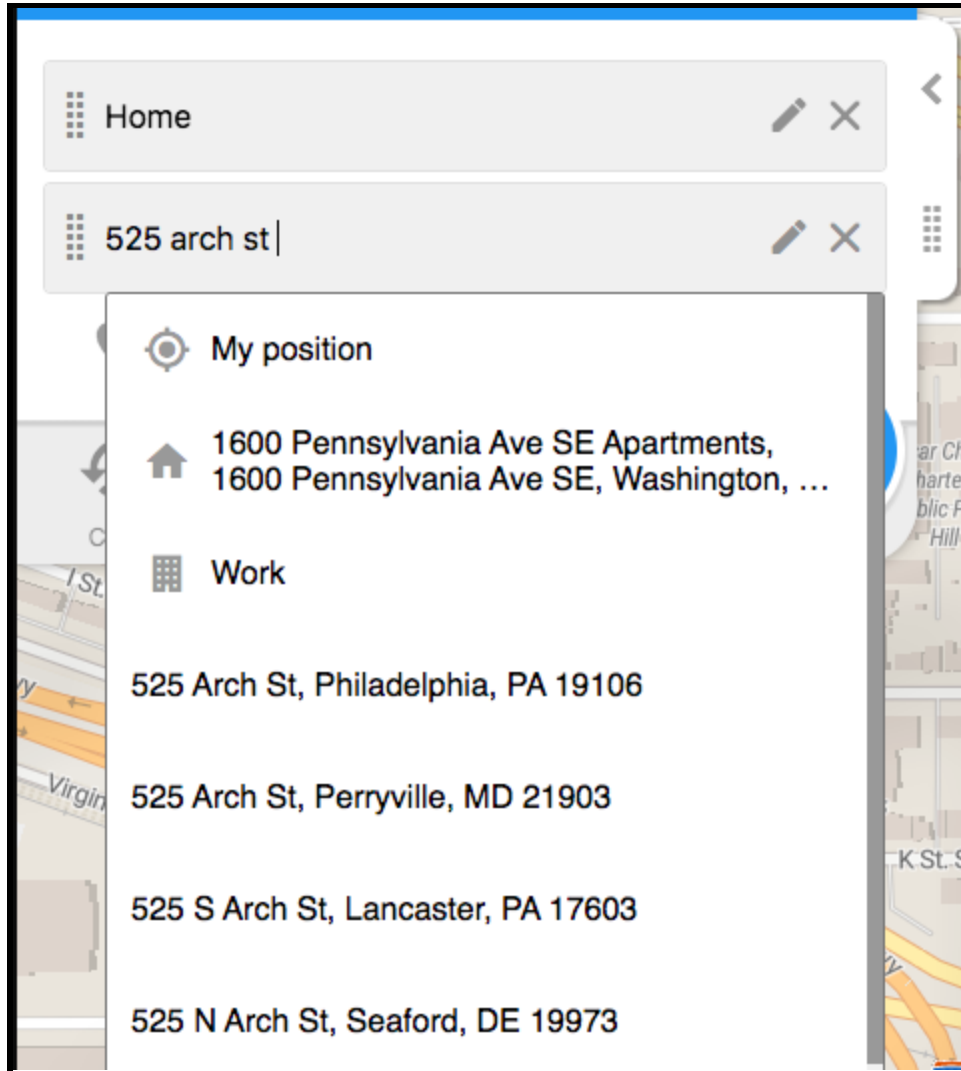
2. Begin typing in "1600 pennsylvania avenue, washington dc", and as you type the list will begin populating with the closest matches. Once it displays that address, select it. To set that address as "Home", click on it and click the "SET" button to the right of "Home":



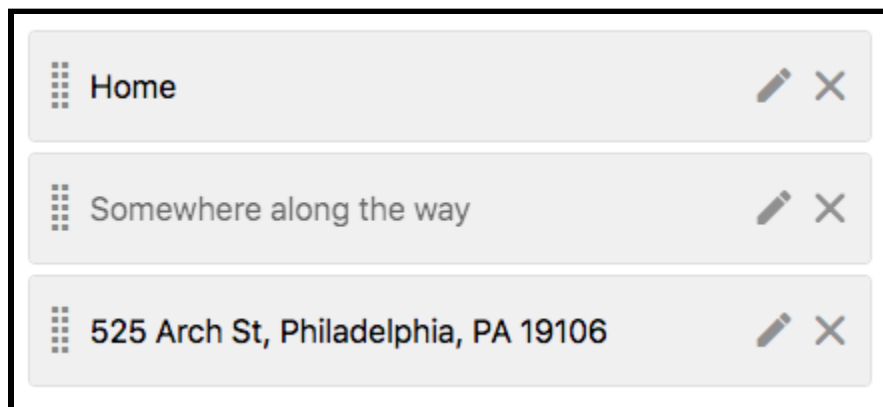
After setting 1600 Pennsylvania Avenue as “HOME”, that is how it will be displayed in the Waypoint list:




3. Now click on the remaining waypoint with “The end of your trip” in it and begin entering “525 Arch st, philadelphia pa”. Note that normally you would correctly fill in “Home” as the end of the trip, but this “error” is just intended to illustrate how to reorder waypoints in the following steps:

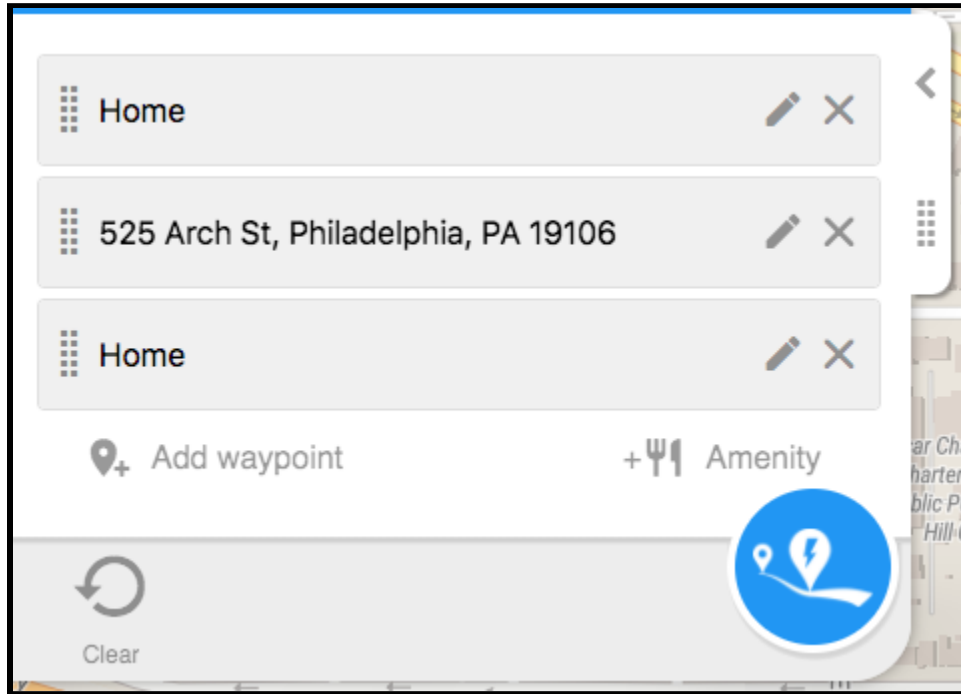



4. Click the “Add Waypoint” button at the bottom of the waypoint list so we can add “Home” as the final destination. Note that the waypoint is inserted in the middle of the list:

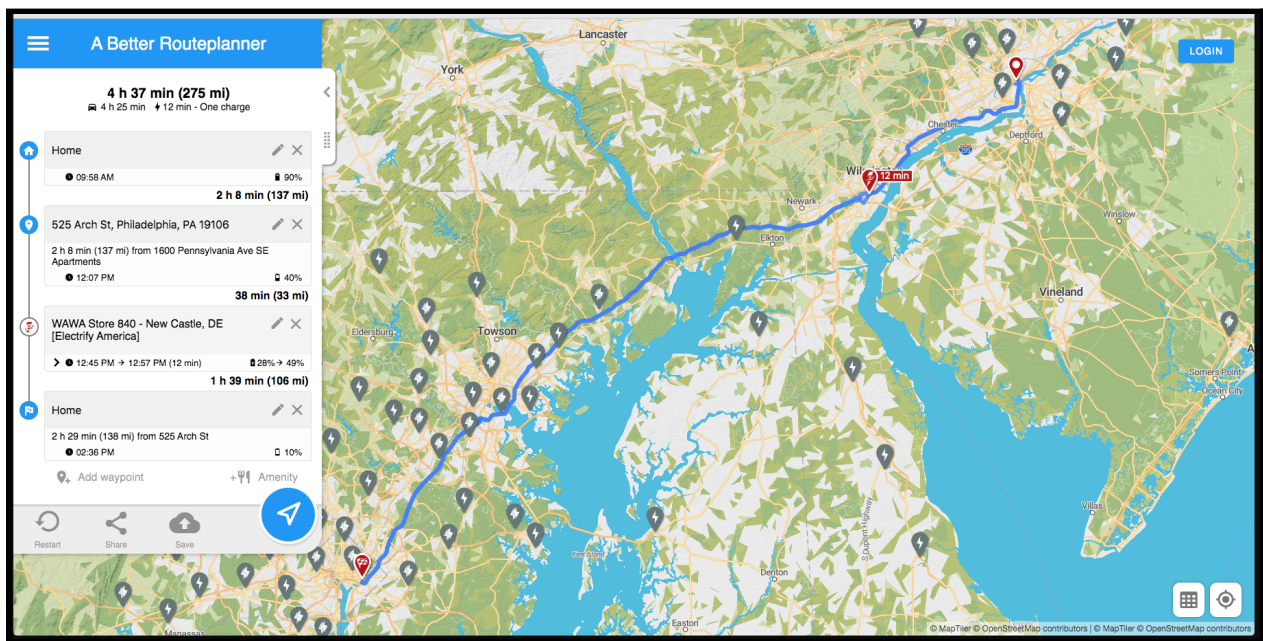


5. Click the text that says “Somewhere along the way”, and select “HOME” as the address

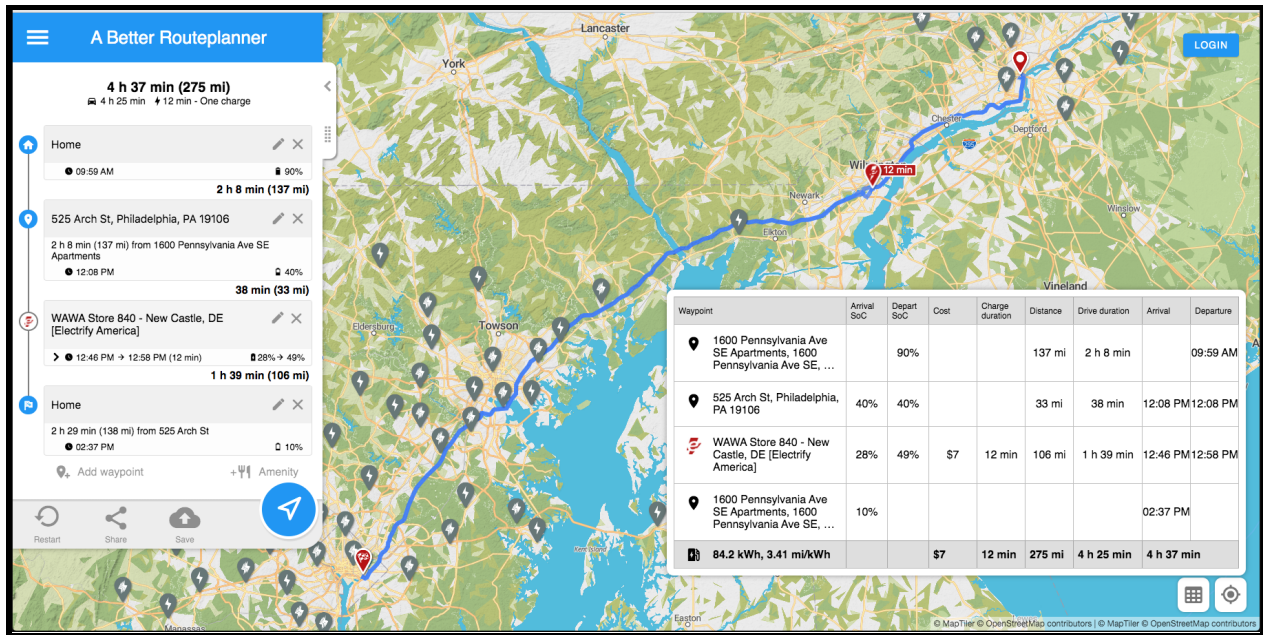
6. Now grab the “525 Arch St” waypoint by the  and move it between the two “HOME” waypoints:



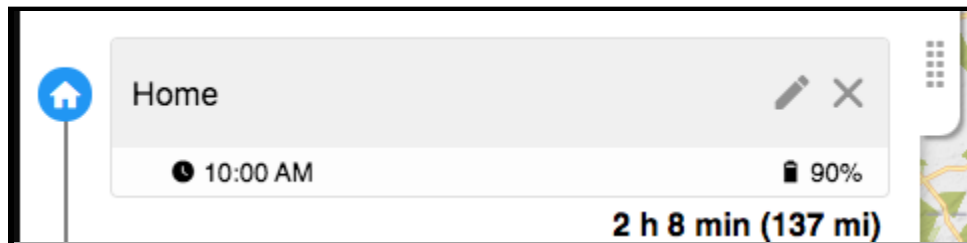
7. Have ABRP compute the trip plan by clicking  which also displays the plan details view along with the route on the map



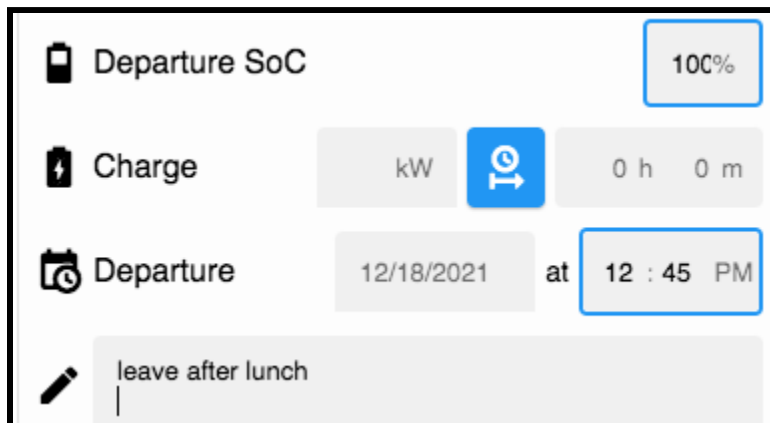
8. To view the list of stops including times in table form, in the lower right click 




9. Now let's set a departure time from home as well as overriding the starting state of charge. To do that, click the pencil icon for the starting waypoint ("HOME"):



10. Enter "100" in the "Departure SoC", and set the departure time to 12:45 PM. To toggle the "AM/PM" value just click on it. Enter "leave after lunch" in the notes section to see how notes are displayed in the waypoint table.




Departure SoC: 100%

Charge: kW  0 h 0 m

Departure: 12/18/2021 at 12 : 45 PM

Notes: leave after lunch

11. Click on  to regenerate the plan, and look at the table to see the change.

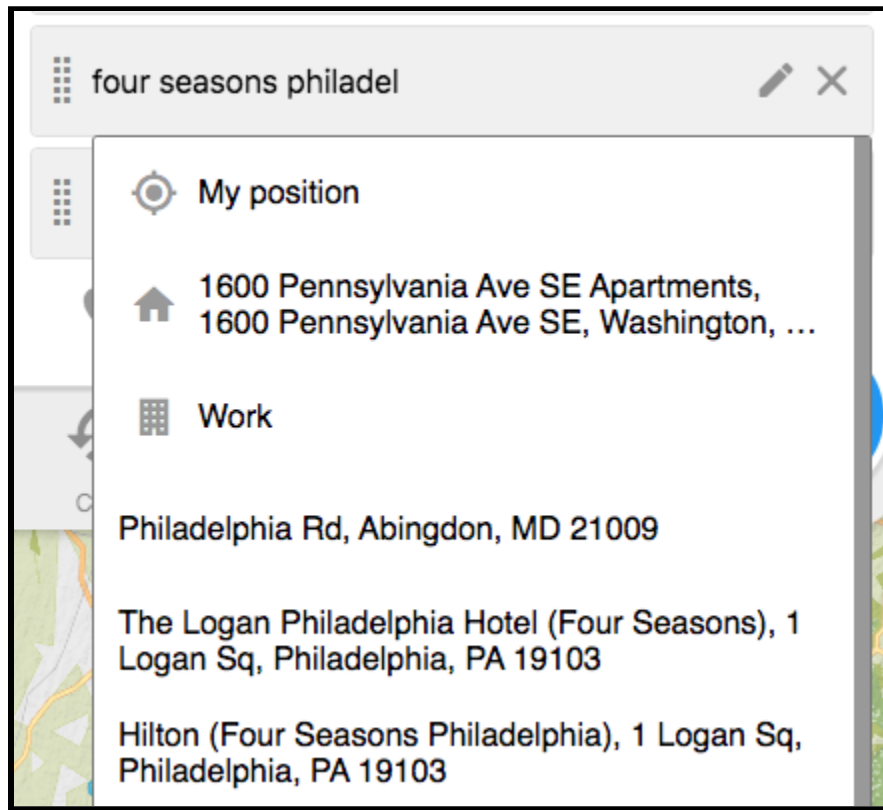
Waypoint	Arrival SoC	Depart SoC	Cost	Charge duration	Distance	Drive duration	Arrival	Departure	Notes
 1600 Pennsylvania Ave SE Apartments, 1600 Pennsylvania Ave SE, ...		100%			137 mi	2 h 8 min		12:45 PM	leave after lunch
 525 Arch St, Philadelphia, PA 19106	50%	50%			33 mi	38 min	02:53 PM	02:53 PM	
 WAWA Store 840 - New Castle, DE [Electrify America]	38%	49%	\$4	7 min	106 mi	1 h 39 min	03:31 PM	03:38 PM	
 1600 Pennsylvania Ave SE Apartments, 1600 Pennsylvania Ave SE, ...	10%						05:17 PM		
 84.2 kWh, 293 Wh/mi			\$4	7 min	275 mi	4 h 25 min	4 h 32 min		

12. Now save the plan by clicking the  button. It will give you an option to replace an existing plan or insert a new one.

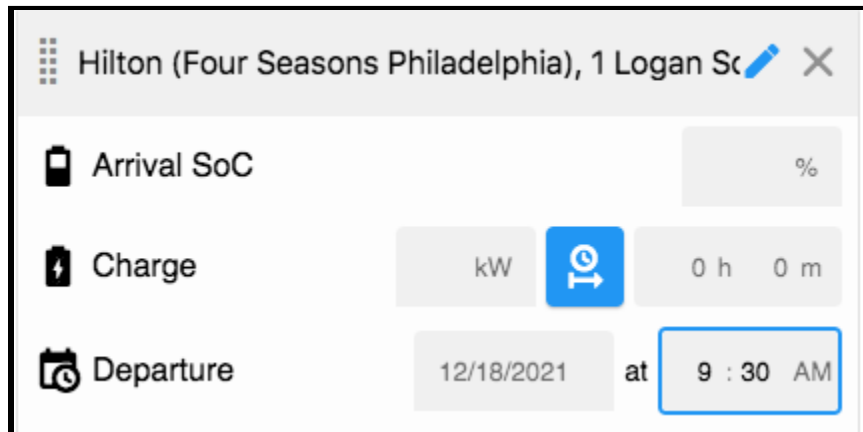
Adding An Overnight Hotel Stop

Now that we've planned a roundtrip to Philadelphia, let's add an overnight stay at the four seasons hotel. The following steps assume you're starting from the "waypoint list" view.

1. Using the steps previously outlined, insert a new waypoint after "525 Arch Street". Enter the address as "four season philadelphia" and allow the tool to fill in the address of the hotel at 1 logan square.








2. Now click on the "pencil" icon for the four seasons hotel and enter the departure time as "9:30 AM".



3. Replan the trip by clicking

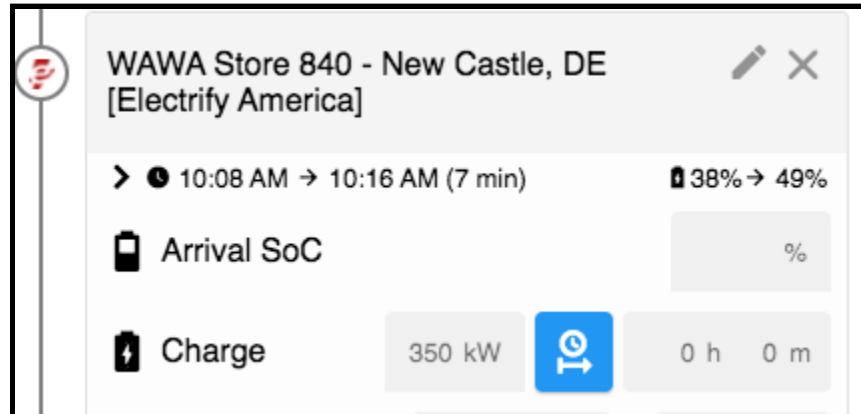


Waypoint	Arrival SoC	Depart SoC	Cost	Charge duration	Distance	Drive duration	Arrival	Departure	Notes
 1600 Pennsylvania Ave SE Apartments, 1600 Pennsylvania Ave SE, ...		100%			137 mi	2 h 8 min		12:45 PM	leave after lunch
 525 Arch St, Philadelphia, PA 19106	50%	50%			1 mi	4 min	02:53 PM	02:53 PM	
 Hilton (Four Seasons Philadelphia), 1 Logan Sq, Philadelphia, PA ...	50%	50%			34 mi	39 min	02:57 PM	09:30 AM (+1)	
 WAWA Store 840 - New Castle, DE [Electrify America]	38%	49%	\$4	7 min	106 mi	1 h 39 min	10:08 AM	10:16 AM	
 1600 Pennsylvania Ave SE Apartments, 1600 Pennsylvania Ave SE, ...	10%						11:55 AM		

Editing Charging Percentage For A Charger

At times it is handy to edit how much of a charge is taken on or the length of time spent at a charging stop. For example, you may want to make sure that you have enough power to get to an alternate charging stop because the planned stop is unavailable.

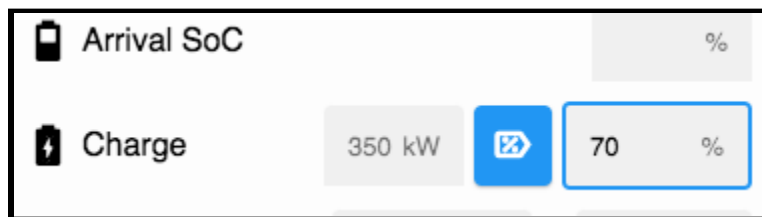
1. In the “Plan Details View” click the “pencil” icon for the Wawa Store in New Castle that was inserted by the trip planner.



2. To specify the target charging percentage instead of charging time, click on




3. Fill in the charging percentage as “70”



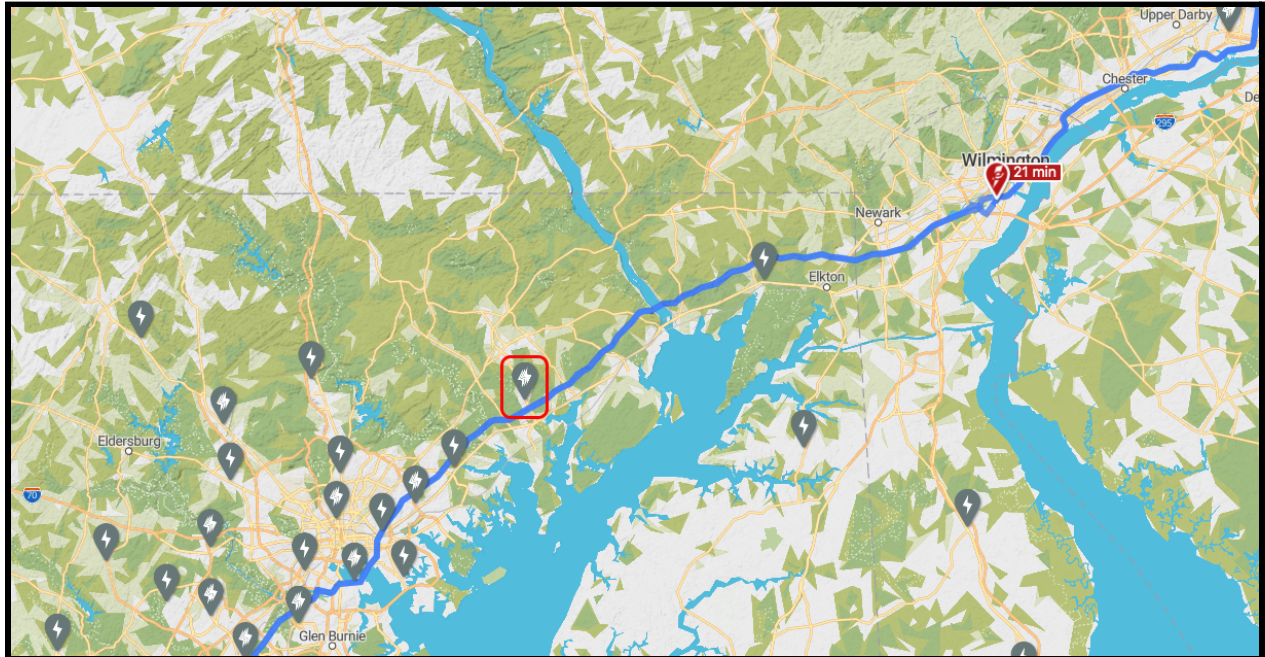
4. Replan the trip by clicking



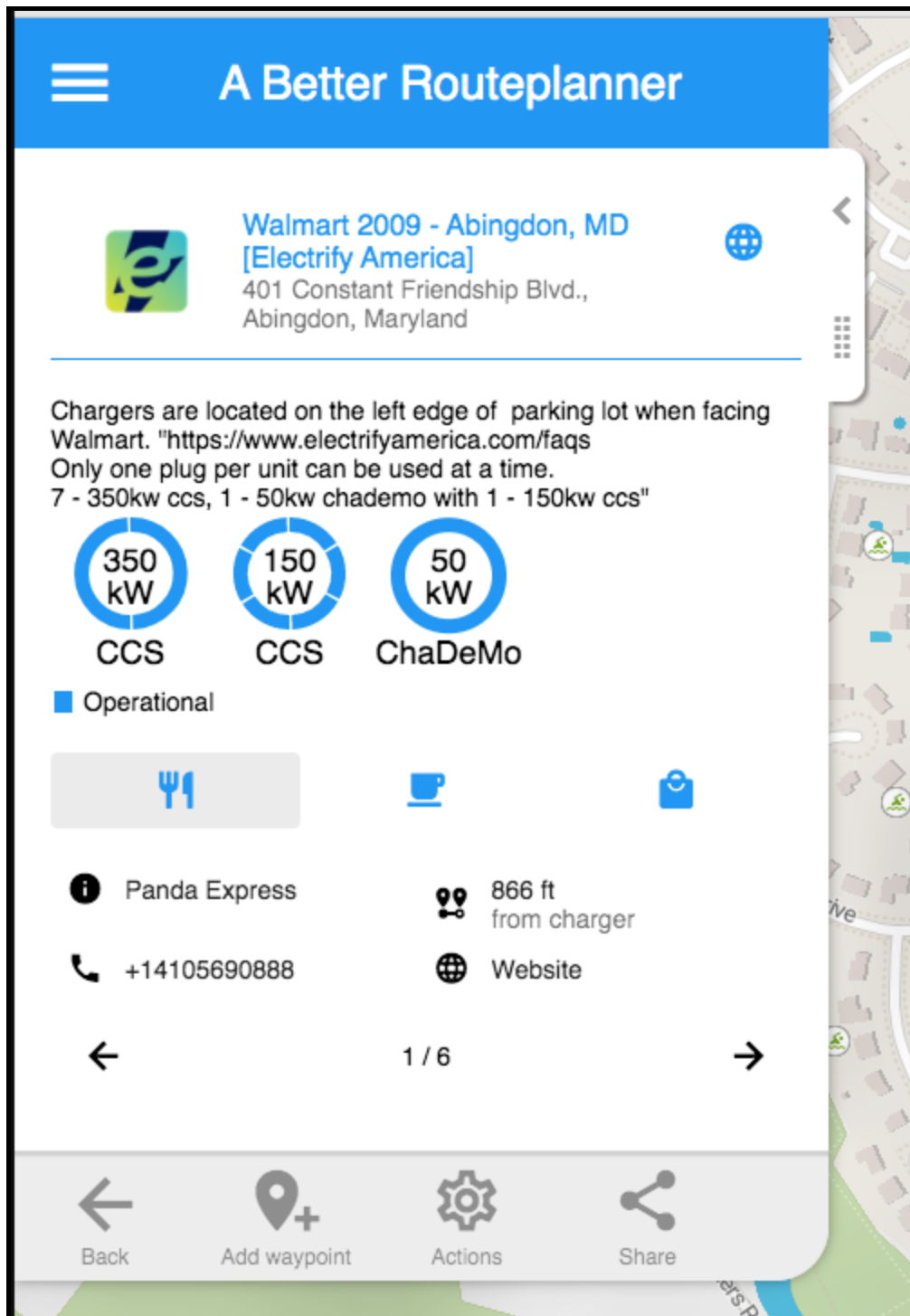
Locate An Alternate Charger

It's a good idea to locate alternate chargers just in case the initially selected charger is unavailable for some reason. After the plan is calculated and the map is updated, locate an ultrafast charger further along the route. Ultrafast chargers are identified by the multiple lightning bolt icon 

1. Click on the Multiple lightning bolt icon along the highlighted path below

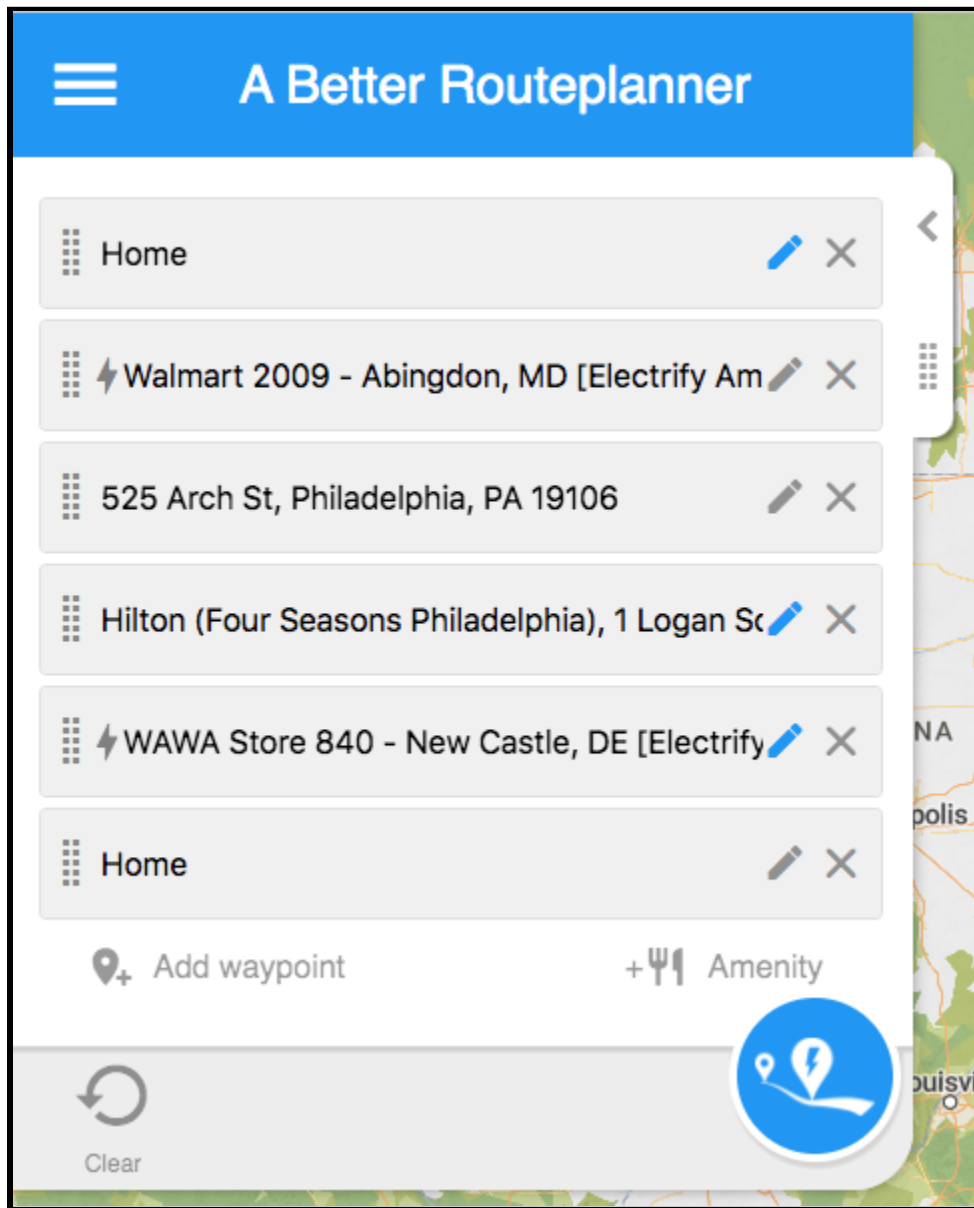




2. Information about the charging location will be displayed in place of the “plan details view”. The types and power levels of the chargers available at the location are surrounded by segmented circles that indicate how many of that type of charger exist - the number of segments correlates to the number of that charger in the location. Blue segments indicate that the charger is operational.



3. To add the location as a waypoint click  Add waypoint

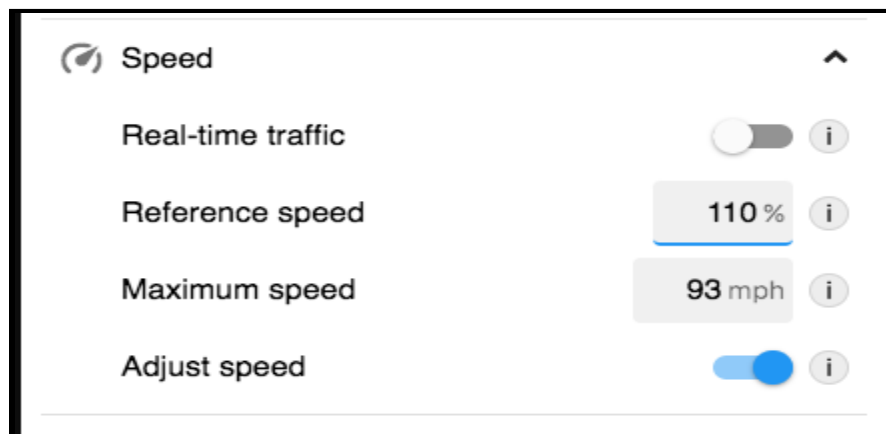
4. After adding the location as a waypoint, the “waypoint list” view is displayed.



5. The waypoint may need to be moved. Drag it by clicking and holding its handle 
6. Now set the charging percentage at the Wawa to 1% to simulate being unable to charge there. To edit the charging percent click the pencil icon for the Wawa waypoint
7. Replan the trip by clicking 
8. The Table View shows that it is possible to make it to Abingdon in the event that the Wawa is unavailable:

Waypoint	Arrival SoC	Depart SoC	Cost	Charge duration	Distance	Drive duration	Arrival	Departure	Notes
1600 Pennsylvania Ave SE Apartments, 1600 Pennsylvania Ave SE, ...		100%			137 mi	2 h 8 min		12:45 PM	leave after lunch
525 Arch St, Philadelphia, PA 19106	50%	50%			1 mi	4 min	02:53 PM	02:53 PM	
Hilton (Four Seasons Philadelphia), 1 Logan Sq, Philadelphia, PA ...	50%	50%			34 mi	39 min	02:57 PM	09:30 AM (+1)	
WAWA Store 840 - New Castle, DE [Electrify America]	38%	38%			48 mi	48 min	10:08 AM	10:08 AM	
Walmart 2009 - Abingdon, MD [Electrify America]	19%	31%	\$4	6 min	60 mi	1 h 1 min	10:56 AM	11:02 AM	
1600 Pennsylvania Ave									

9. Now edit the Wawa charging location to have your initial charging level to 70% again. Alternatively, you can simply hit the “reset” button for that waypoint so that ABRP computes the charging level.
10. You can leave the alternate location in the waypoint list and change its charge level to 1% to prevent ABRP from charging at the alternate location, or you can add the address and departure SoC% of the abingdon charger to the notes for the Wawa waypoint.
11. In the event that an alternate charger beyond the “primary” charger (selected by ABRP) cannot be reached, you will need to: work backwards and manually increase the charge level achieved at the prior stop, add a charger before the one that ABRP selected (making the charger selected by ABRP the alternate/backup), or configure ABRP to try recomputing the trip to your preferred alternate charger at a speed lower than the “reference speed”. To allow ABRP to adjust your speed below the “reference”, go to the settings menu and under the “speed” section enable the “adjust speed” setting:



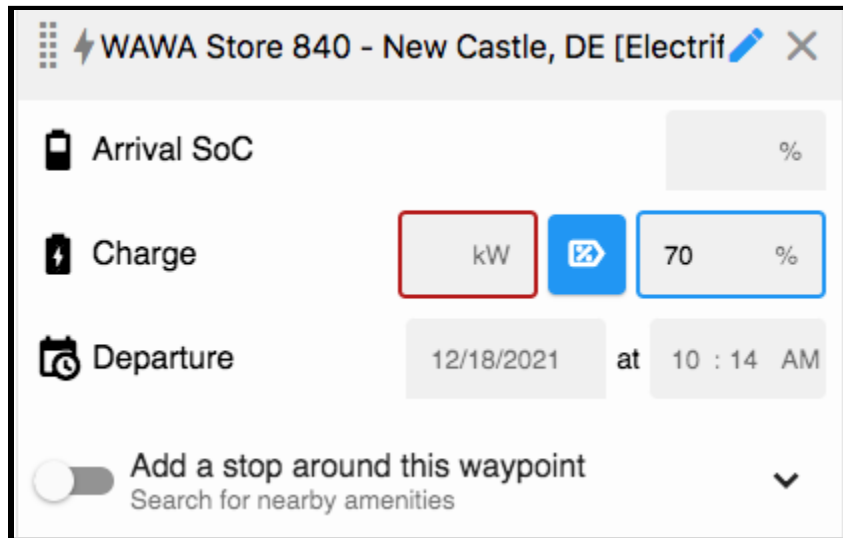
12. Replan the trip by clicking



Adding Amenities To A Charging Stop

To better make use of the time spent charging, it is convenient to work stops into mealtimes. While it is possible to find chargers close to restaurants within walking distance of charging stops, ABRP can help you find them automatically. Continuing with the example trip, we will change the arrival time at the Wawa to coincide with lunchtime and search for nearby restaurants.

1. In either the “waypoint list” view or the “plan details” view click the “pencil” icon to edit the waypoint



WAWA Store 840 - New Castle, DE [Electrify] ✕

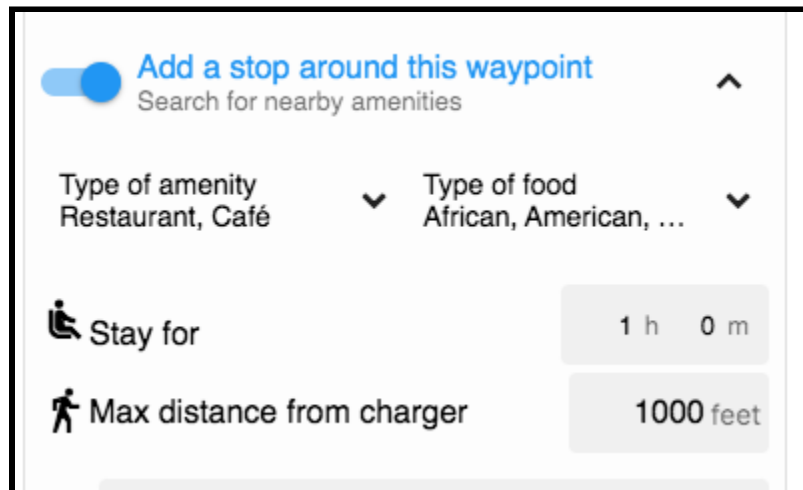
Arrival SoC %

Charge kW kWh 70 %

Departure 12/18/2021 at 10 : 14 AM

☐ Add a stop around this waypoint
Search for nearby amenities

2. Enable the “add a stop around this waypoint” and select “restaurant” as the amenities type



☒ Add a stop around this waypoint
Search for nearby amenities

Type of amenity Restaurant, Café Type of food African, American, ...

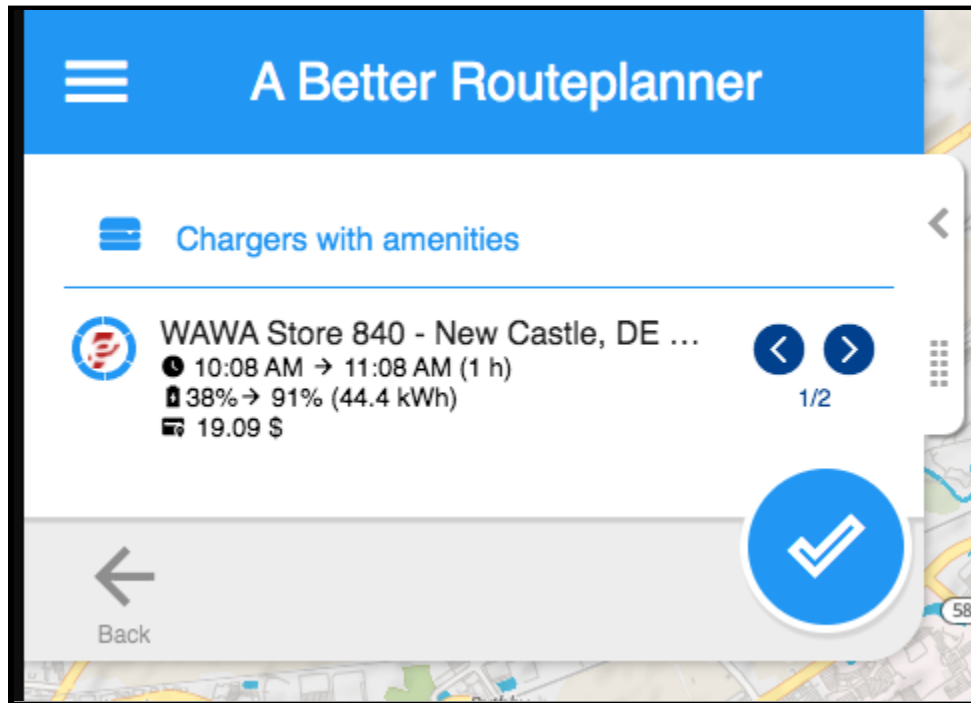
Stay for 1 h 0 m

Max distance from charger 1000 feet

3. Replan the trip by clicking



- As part of the replanning, ABRP will present a list of alternate chargers nearby the Wawa waypoint that may have more interesting restaurant options.







- To cycle through the list of chargers click the left or right arrow icons. In this case the Christiana Mall has a several “sit down” restaurants, so select that charger and click



- After seeing the arrival time, edit the departure time from the Four Seasons hotel to 11:15 AM to arrive at the christiana mall at a more appropriate time for lunch

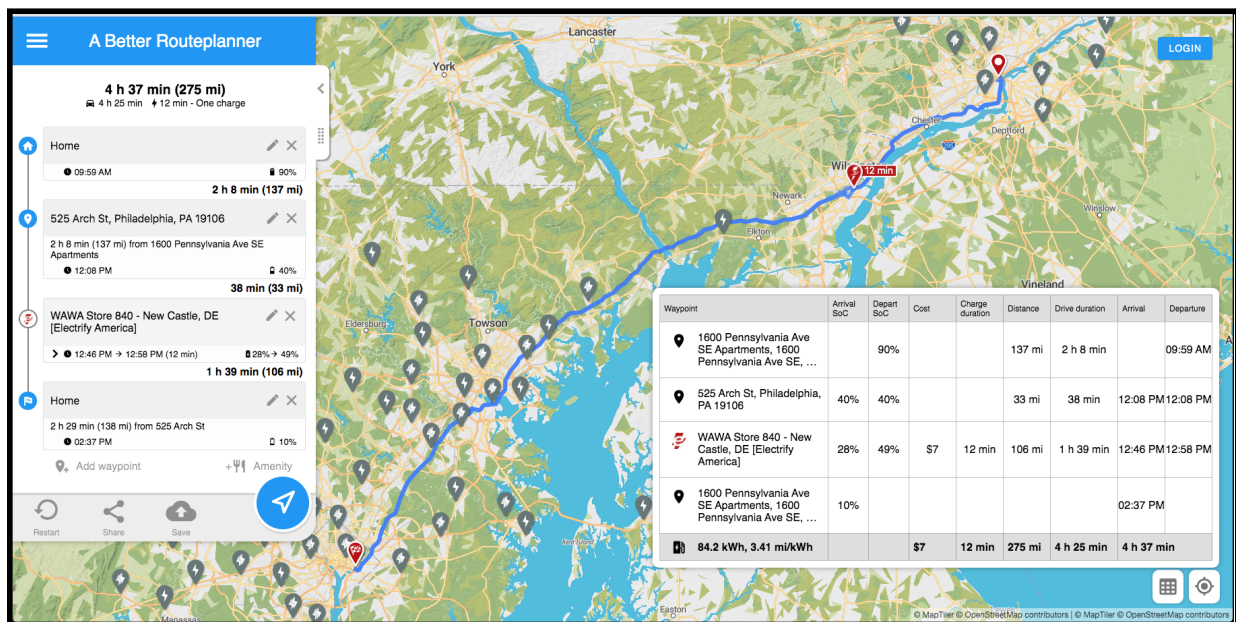
- Replan the trip by clicking  and the table view will look like this:

Waypoint	Arrival SoC	Depart SoC	Charge duration	Distance	Drive duration	Arrival	Departure	Notes
 1600 Pennsylvania Ave SE Apartments, 1600 Pennsylvania Ave SE, ...		100%		137 mi	2 h 8 min		12:45 PM	leave after lunch
 525 Arch St, Philadelphia, PA 19106	50%	50%		1 mi	4 min	02:53 PM	02:53 PM	
 Hilton (Four Seasons Philadelphia), 1 Logan Sq, Philadelphia, PA ...	50%	50%		45 mi	49 min	02:57 PM	11:15 AM (+1)	
 Christiana Mall - Cheesecake Factory [Volta]	33%	85%	1 h 8 min	101 mi	1 h 37 min	12:04 PM	01:12 PM	

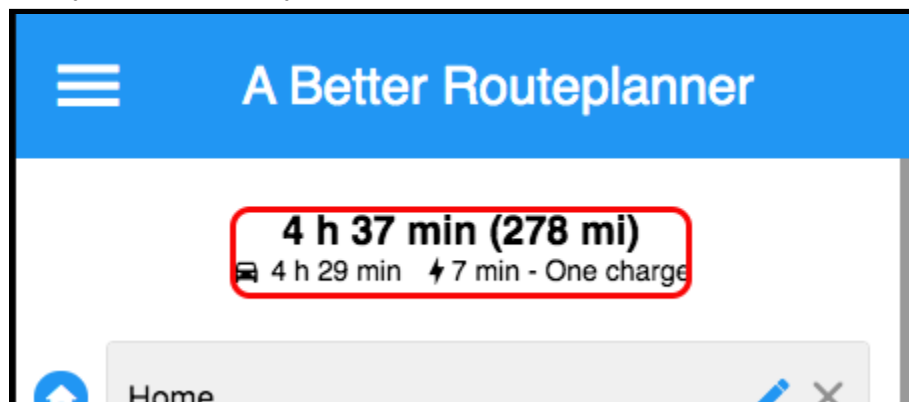
Adjusting For Cold Weather

BEV's are affected by colder temperatures, and ABRP does have controls in the settings menu to enter prevailing weather conditions. However, I have not yet had an opportunity to test its accuracy in temperatures colder than 40 degrees Fahrenheit. The formulas may not properly compensate for colder situations, particularly since there are no settings for the 2 things that can impact cold weather efficiency the most: preconditioning and cabin heater settings. The best recommendation would be to try to do a half hour or more highway test tracking the mi/kwh efficiency of the car and comparing that to the efficiency computed by ABRP.

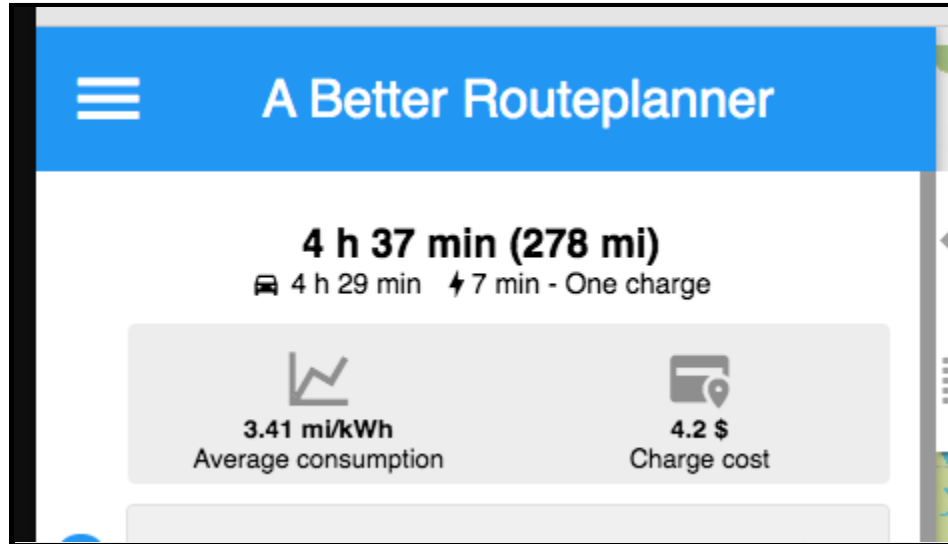
1. The "waypoint table" that is visible in the "plan details" view displays the computed efficiency at the bottom:



2. To see the computed efficiency in the summary at the top of the "plan details" view click anywhere on the trip summary at the top (click anywhere inside the red border to toggle the visibility of the efficiency):



3. The summary will now also include the estimated efficiency. Note that it also includes an estimate of the charging cost; this estimate may or may not be accurate as some chargers don't report their pricing structure to ABRP. To determine if a charger's cost is known or not, be sure to look through the waypoint table to see if a cost is computed for each charger in the plan:



Warnings And Recommendations

- **There is no “undo” action:** Care must be taken when editing a trip. It is highly recommended to save the plan after making several significant changes so that you may go back to that last saved point in the event of a significant error
- **Be careful clicking on the address of a waypoint:** In either the “waypoint list” or “plan details” view clicking on an address will bring up the address selection list. Make sure you click on the same address in the list; clicking outside of the list or selecting a different address in the list will replace it. If you fail to notice this and correct it, then the next time you regenerate the plan it will do so with that unintended change
- **Exporting plans:** Plans may be exported to excel or google maps through the “Share” button. I recommend exporting to an excel spreadsheet on your phone to be able to retrieve the best level of detail while driving
- **Validate charger reliability with plugshare.com:** Once you’ve mapped out a plan, I highly recommend checking the reviews of your selected charger locations. Some locations have notoriously poor reliability and/or issues with chargers being blocked by parked cars not charging due to their close locations to entrances. For example at the time of this writing the Electrify America location in Gainesville Florida 3 of the 4 chargers were out of service. In that case it is best to manually select a different location on the route to use as the “primary” charger location.
- **Replan just before going on the trip:** If you plan a trip well ahead of time it is best to have ABRP recalculate the plan a few days before the trip is set to begin. This will give you the opportunity to set the true weather conditions in the settings menu as well as finding potential last minute issues with charging locations being out of service. At that time it is also recommended that you check the latest reviews through plugshare.com as well as the state of the chargers (i.e. are any of them out of service).
- **Find Hotels with L2 chargers:** Plugshare is also an excellent way to locate hotels along your route that have L2 charging available. The same suggestions apply for reading reviews about the L2 chargers being broken and/or constantly blocked by cars not charging. Unfortunately many hotels put their L2 chargers in prime parking spaces and don’t bother to enforce the “for charging only” rule. For that reason it is recommended not to rely on sites with only 1 or 2 chargers as the chances of them being blocked, broken, or in use by someone else is so great.
- **Get a TeslaTap for L2:** Many hotels only have Tesla “destination chargers” which are compatible with the Mach-E by use of an adapter. Many of these adapters are available on EBAY and elsewhere, but beware there are a large number that are not certified and tested, and may not be rated for the minimum 60 Amps required. There is a company called “TeslaTap” that is highly recommended, UL listed, and certifies their adapters for the necessary 60A current.
- **Overriding default charge levels:** ABRP will allow the charge to drop down to 10% and go up to 100%, neither of which is necessarily a good idea. Charging above 80% tends to slow down significantly, and charging down to 10% doesn’t leave much margin for error. I do however like to charge to 100% at home just before leaving:



Settings



Plan settings



Car model

Ford Mustang Mach-E Extended Range RWD (alpha)



Departure SoC



100 %



Reference consumption

mi/kWh @ 65 mph

3.4



Charging stops



Fewer stops

Quickest arrival

Shorter legs



Chargers & Networks



Battery



Destination arrival SoC

15 %



Charger arrival SoC

20 %



Charger max SoC

80 %

