Tutorial on how to use
DJIFlightPlanner (for planning)
# with Litchi (for flying)

INITIAL STEPS:

- Install **DJIFlightPlanner** (DJIFP) on your Windows PC. A 30-day fully-functioning demonstration version is available, and full single-PC licenses cost US$99.

- Contact info@djiflightplanner.com for help with the purchasing of and/or technical support for the DJIFlightPlanner software.

- Purchase **Litchi** from either the Google Play Store for your Android device, or the Apple App Store for your iOS device.

- Contact vctech@flylitchi.com for help with the purchasing of and/or technical support for Litchi. Also visit their help page here: https://flylitchi.com/help

- Install **DJIFlightPlanner** (DJIFP) on your Windows PC and follow the licensing instructions, or email info@djiflightplanner.com for help.

- On your Android device or iOS device, purchase & install the **Litchi** app. You should also install the latest DJI Go app for your drone if you haven't already.


- There is an easy way to sync Litchi missions to your device over the web, for both Android and iOS devices. In either case you will need a Litchi account, which is free to set up through the Litchi Mission Hub here: https://flylitchi.com/hub

- Your initial objective should be to create & export a small test flight plan from DJIFlightPlanner, transfer it to Litchi, and then fly the plan. We would recommend choosing an open area with no trees or obstacles so that on the first flight you can concentrate on the workflow itself.

- Let's go through these processes now, with illustrations on how to accomplish the tasks required. The final page of this document shows the best order for starting everything up.

- Launch DJIFP on your PC. Press the "SEARCH" button and enter the approx. street address, or press "LAT/LONG" and enter approx. coordinates for the area you wish to fly.

- Use the mouse wheel to zoom in to your area of interest.
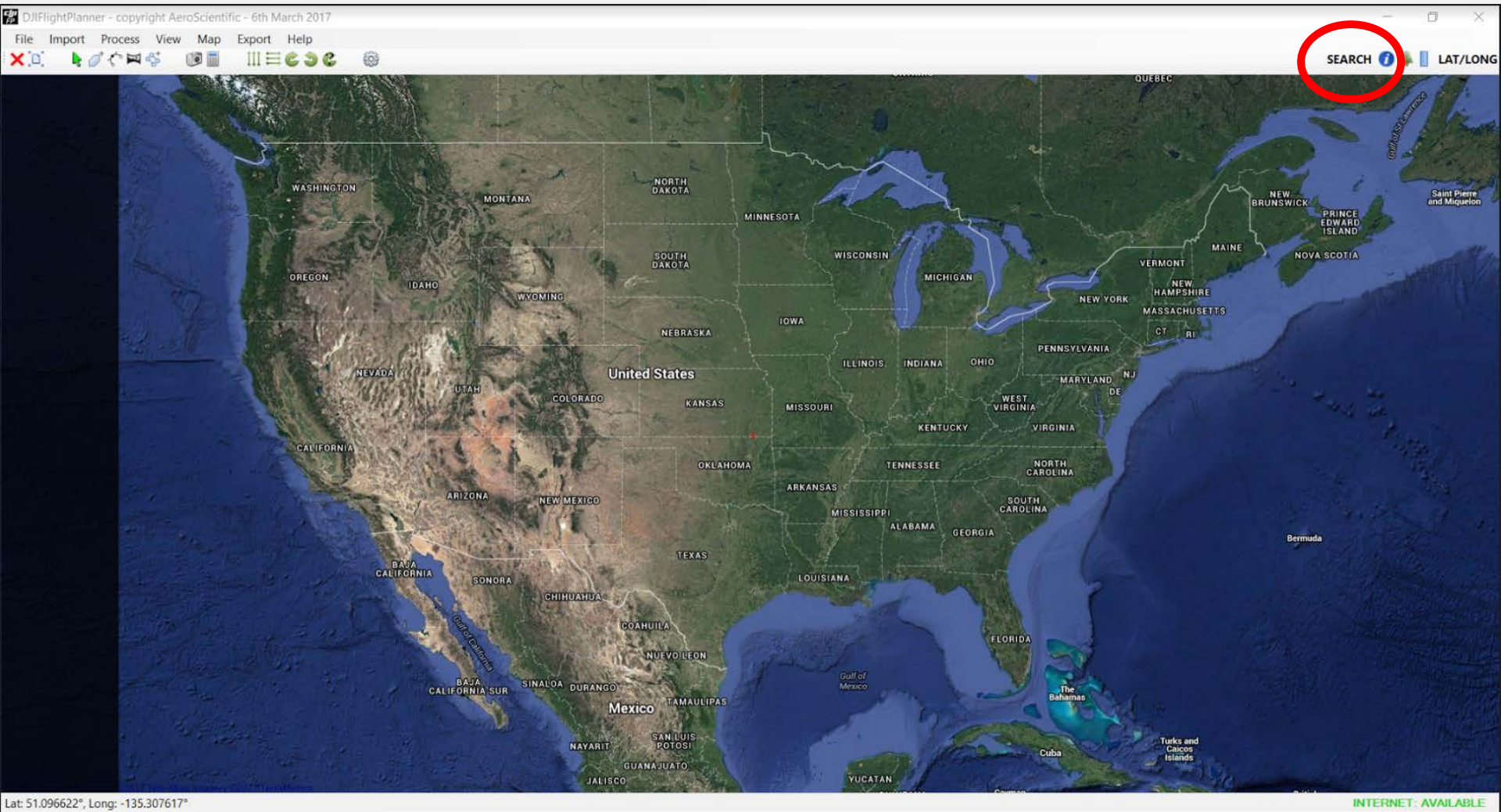
- Use the "POLYGON" (see red arrow below) and left-mouse click to fence around the area you wish to fly autonomously. Choose a large open area with no trees, buildings or powerlines, where there is a good place to take off and land, allowing you to see the drone at all times. Preferably fly on a day when it isn't windy.
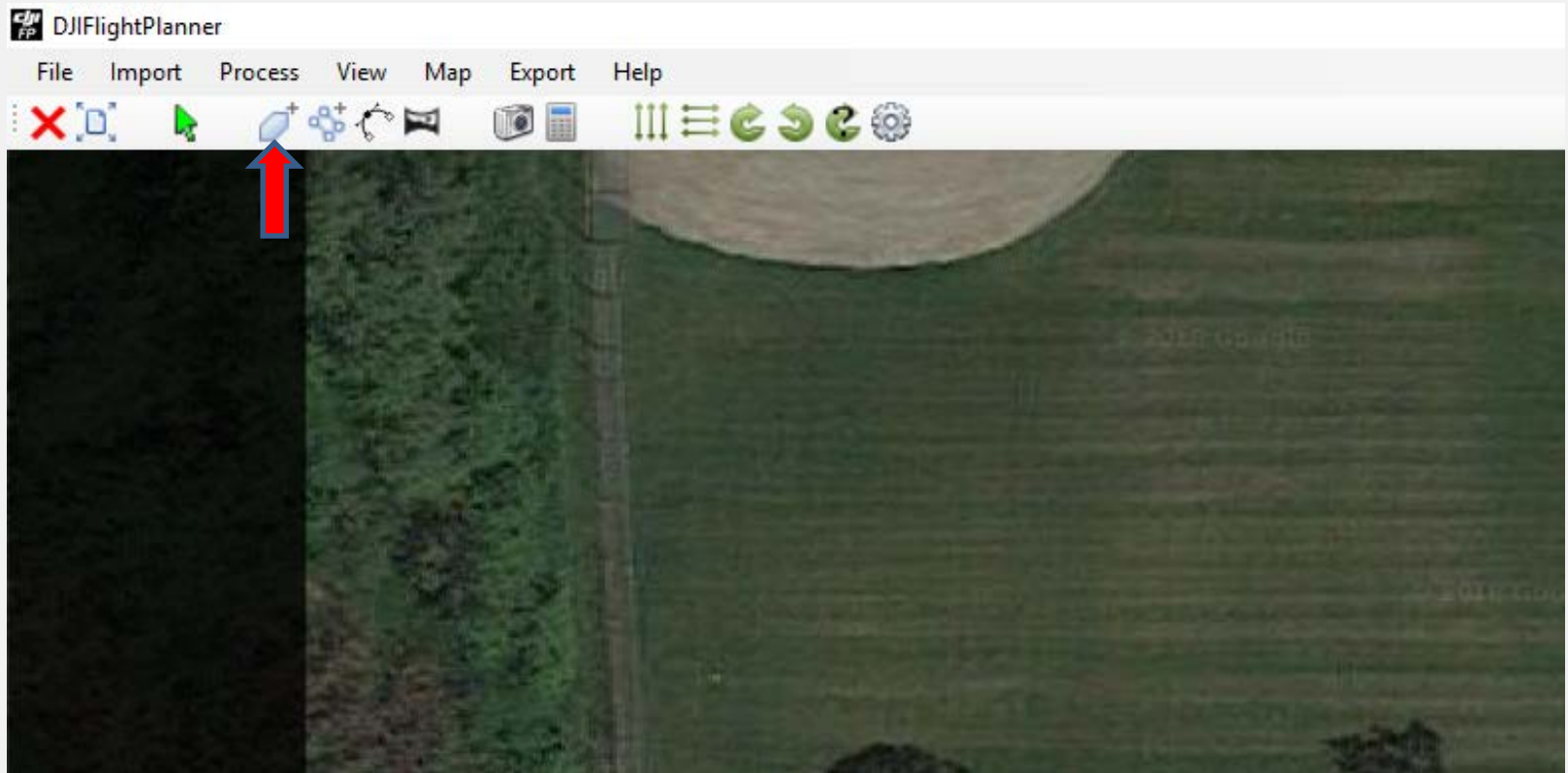
- Once your area has been marked, press ENTER or ESCAPE to close the polygon. The "*Camera, imaging & miscellaneous parameters*…" dialog box will be presented. There are several parameters that can be entered, but for this small example, simply choose your drone from the drop-down list of choices, and revise **Altitude** to 100 feet. Then press the green "ACCEPT" button.
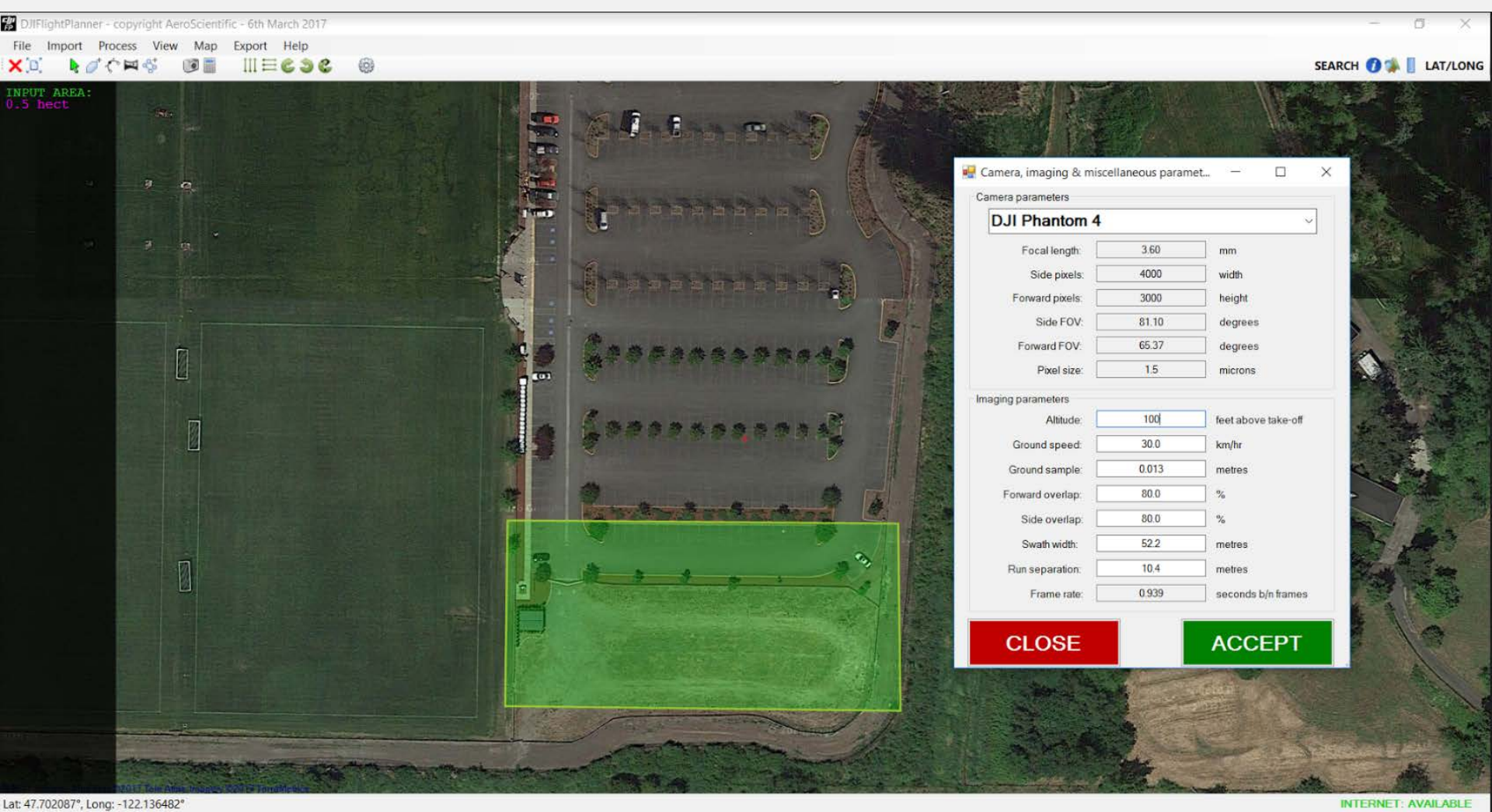
- The "*Choose flight line calculation method*" dialog is now presented. This dialog is used to set the flight line orientation in the flight plan. In this example, we selected "EAST-WEST". Another option is to use "AUTOCALC" and let DJIFlightPlanner calculate the most optimal flight path/s for your area. You can also manually enter an orientation in degrees.

- The next slide will show all waypoints that were automatically calculated by DJIFP.
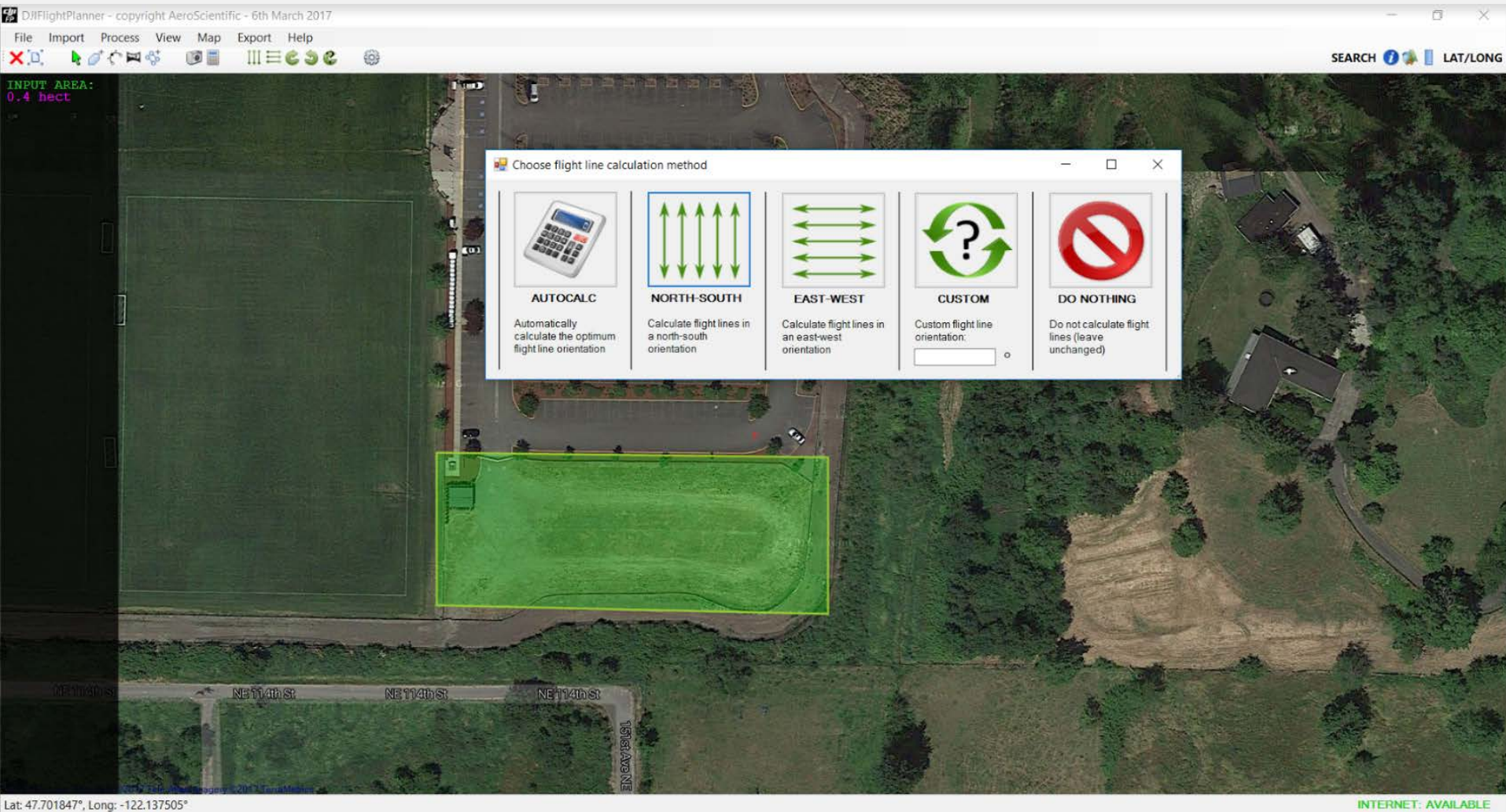
- The flight lines and waypoints are now illustrated on the screen. The white node-points on each line represent approximate camera trigger locations to achieve the desired overlap/s.

- As seen here, the flight path/waypoints encompass a larger area than initially "fenced". You can marquee-drag the mouse over the waypoints you don't want, or select the entire line and then press the "Delete" key on the keyboard to remove unwanted points/lines.
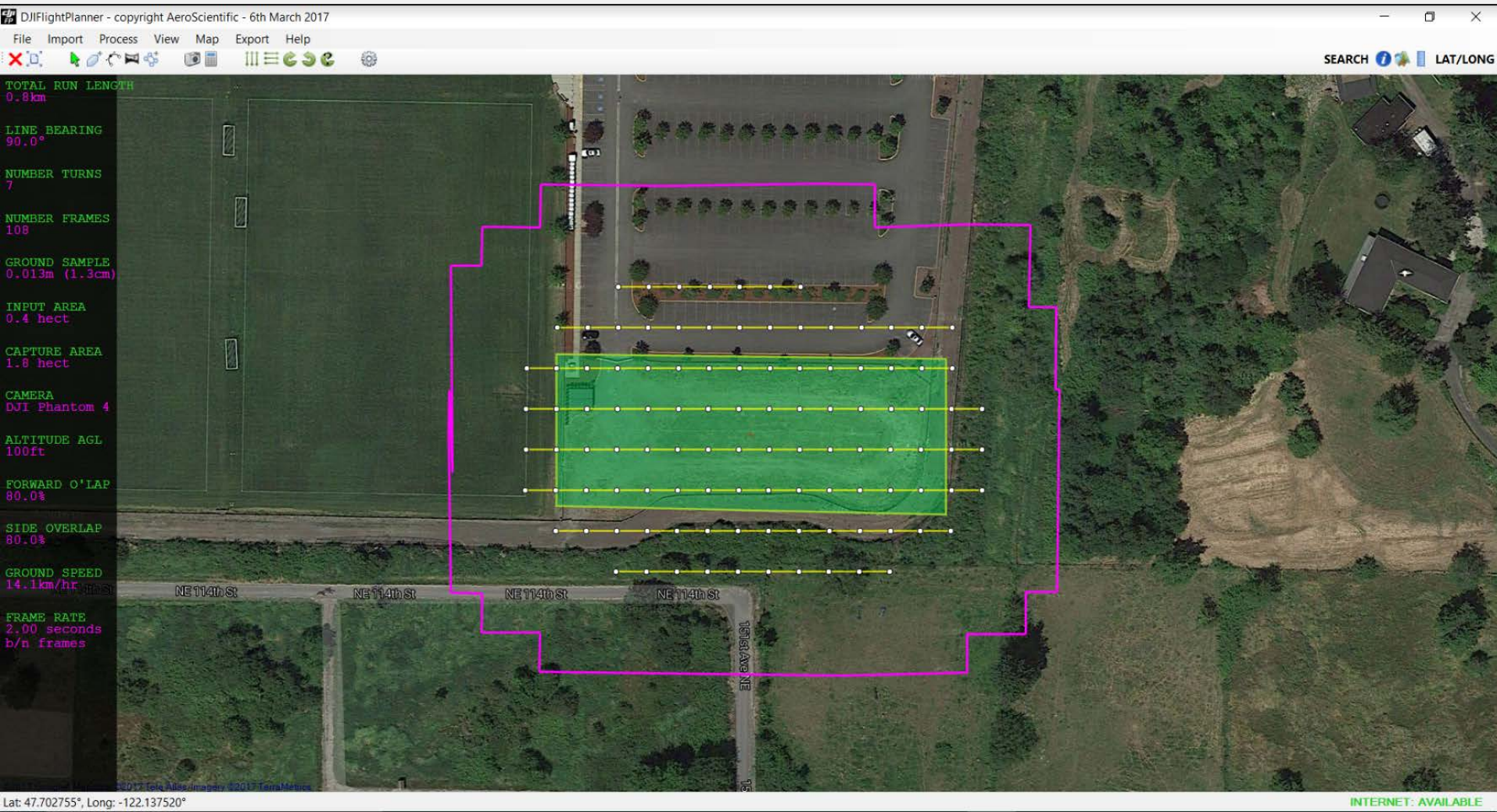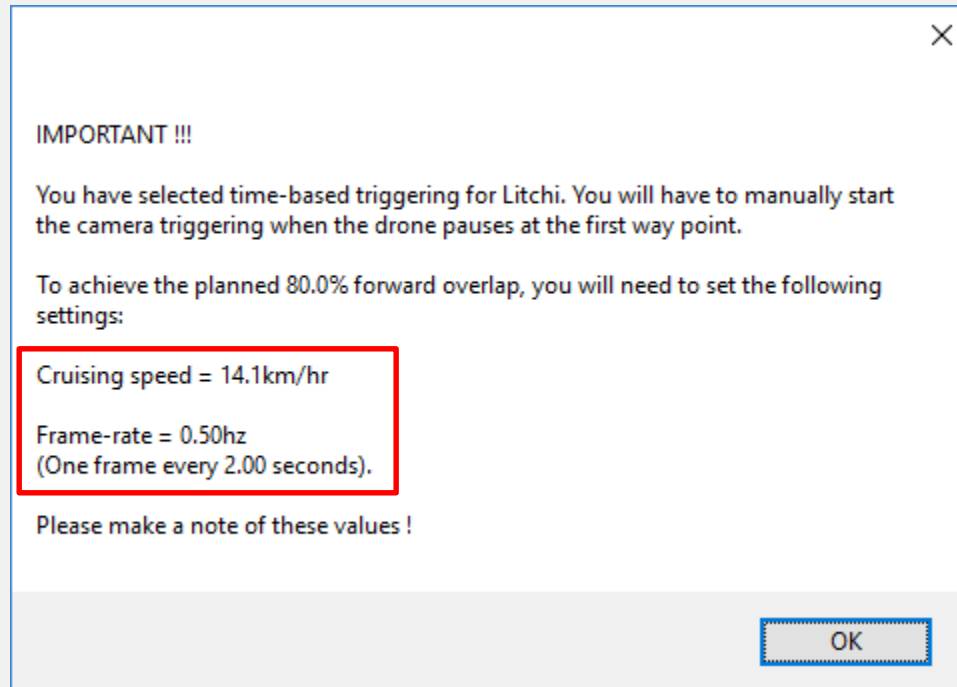
- After tidying up the plan by deleting any unwanted points/lines, observe the left-hand-side of the screen which shows various parameters for your planned flight path. In this example, the flight path requires three "turns" with a quantity 52 frames to be captured. The ground sample distance (GSD), or 'pixel size', will be approx. 1.3cm. The next slide illustrates how you can export the flight plan in .csv format for use in Litchi.
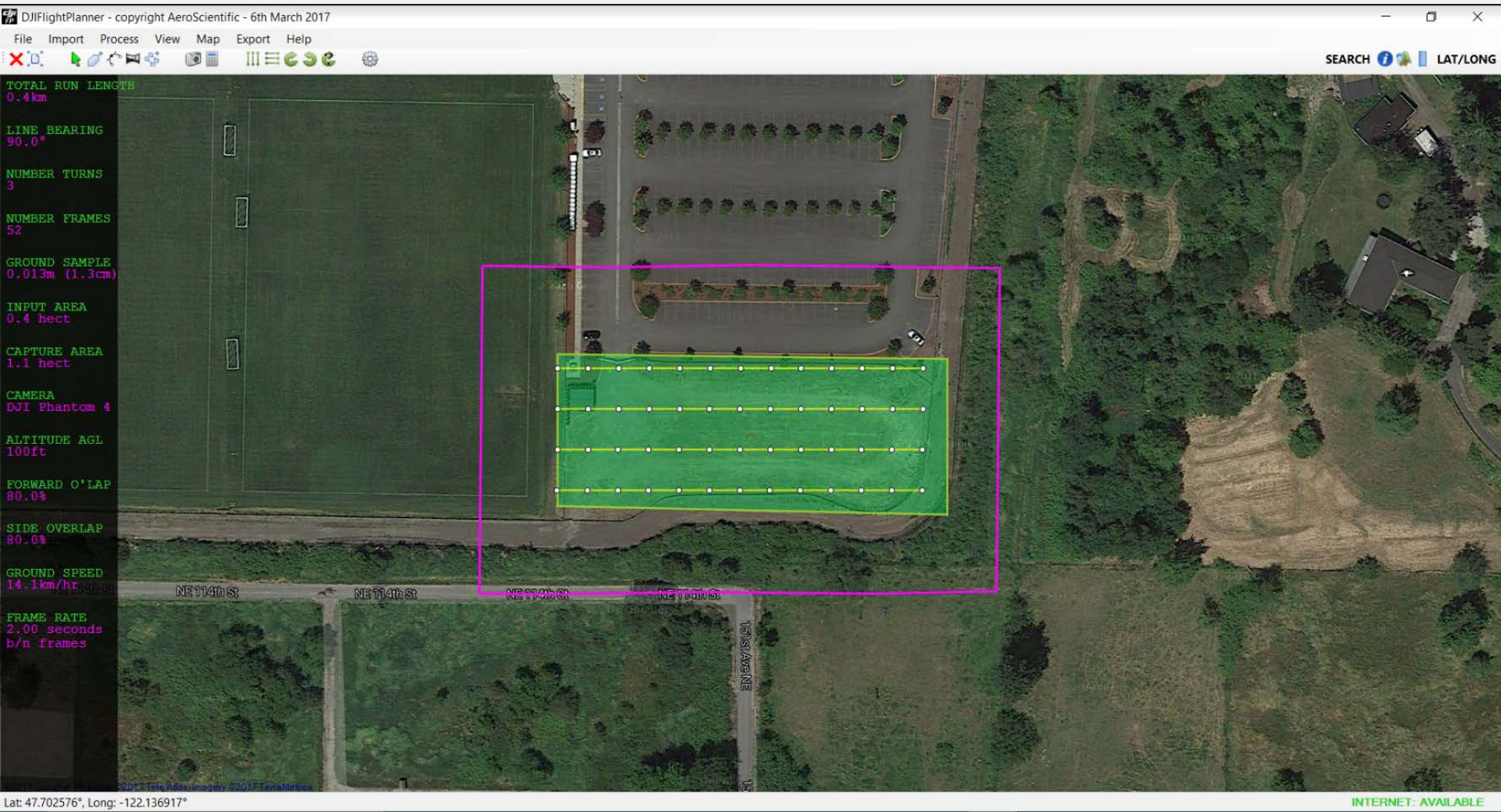
- Under the "Export" menu, select "CSV for Litchi…" and the "Flight plan export options…" dialog box is presented. There are two different methods for triggering the camera "Position-based" and "Time-based". If you select position-based, the drone will stop at each waypoint and trigger the camera. If you select time-based, the drone will fly to the first way point and you can start the interval trigger in the Litchi app (details on next page) which will start triggering based on time so that you achieve the planned forward overlap.
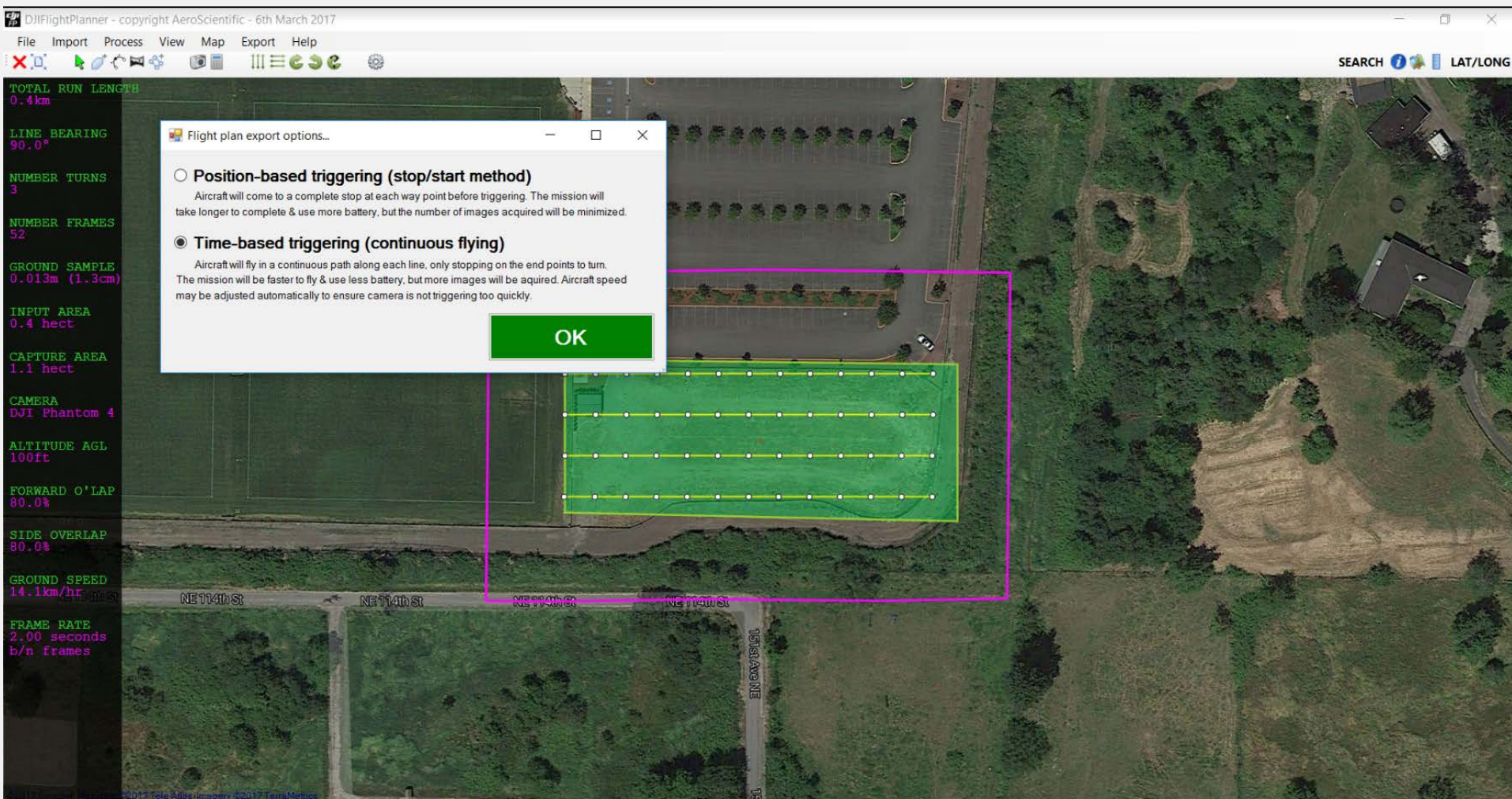
- **IMPORTANT** - if you choose 'time-based' triggering, the drone will fly continuously through the entire flight plan without stopping. This makes flight plans much quicker to fly and saves battery. It will trigger the camera based on time to achieve the desired forward overlap. A message like the following will appear, reminding you to take note of the 'cruising speed' and 'frame-rate', as you will need to enter these parameters in Litchi.

IMPORTANT !!!

You have selected time-based triggering for Litchi. You will have to manually start the camera triggering when the drone pauses at the first way point.

To achieve the planned 80.0% forward overlap, you will need to set the following settings:

Cruising speed = 14.1km/hr

Frame-rate = 0.50hz
(One frame every 2.00 seconds).

Please make a note of these values !

OK

- The "Save As" dialog is now presented, and you simply need to give the flight plan a name and save the file. For good file management, we suggest naming each .csv file such that it contains a name, date, and rough flying parameters, so then it is easy to remember what each flight plan file is for. For example, instead of just calling the file 'test.csv', consider calling it 'test_14AUG2017_100ft_52frames.csv'.
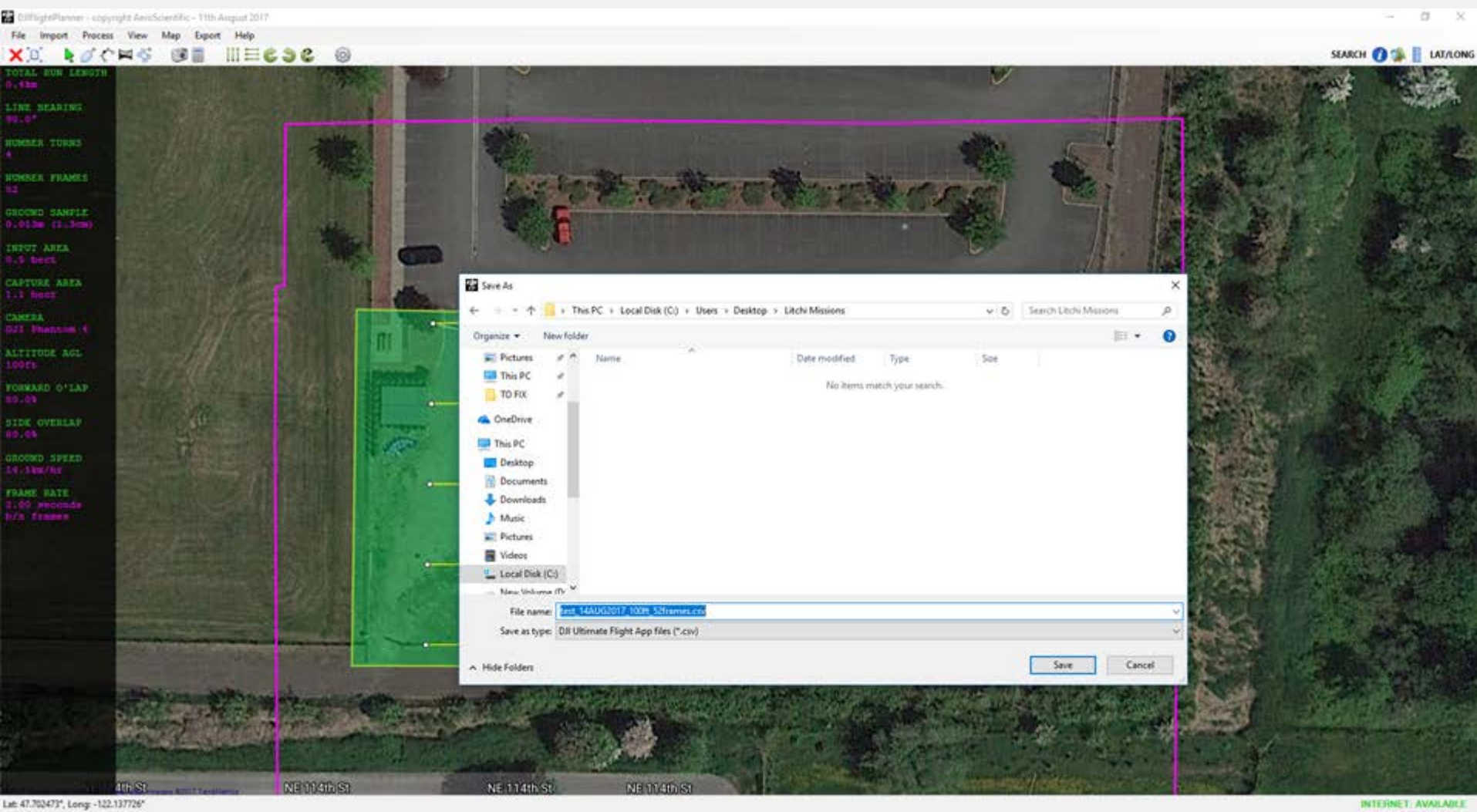
- To import a flight plan into Litchi for sync'ing, open the Litchi Mission Hub webpage and log into your account: https://flylitchi.com/hub

- Select "MISSIONS" -> "**Import…**" and select the exported .csv file from DJIFlightPlanner:
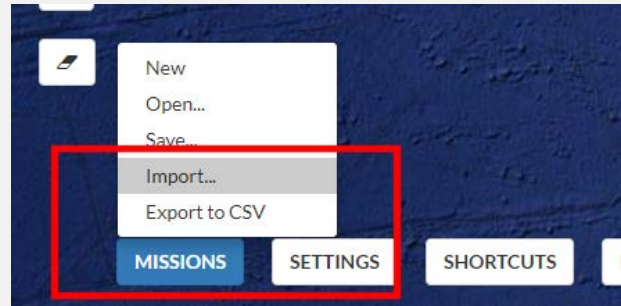
- without modifying anything, verify that the mission has loaded correctly.

- select "MISSIONS" -> "**Save…**" and this will sync the flight plan to your Litchi account:
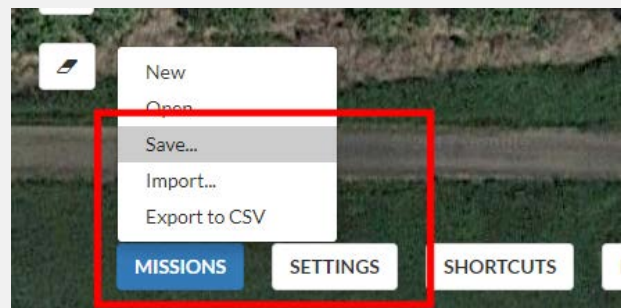

- We recommend saving the flight plan with the same name as the .csv flight plan file.

- After saving the mission, if you are logged in to your Litchi account, the mission will be sync'ed automatically to your device. **This is the easiest way to transfer your flight plan(s) to your Android/iOS device so that they area available to the Litchi app for flying.**

- If you cannot use the Litchi Mission Hub, you can manually place flight plan(s) on your device for flying. To do this, download the mission after saving it, go to "Missions"->"Open"->"My Missions". This will download a binary-version of your flight plan (not .csv format).

- Then you can manually place the downloaded file inside your mobile device's Litchi missions folder. The folder is located in "LitchiApp/missions" on Android and "Litchi/missions" on iOS.

- On iOS, you will need third party software to transfer the mission files to the app folder (such as i-funbox). This screenshot shows where to place the files on your iOS device.
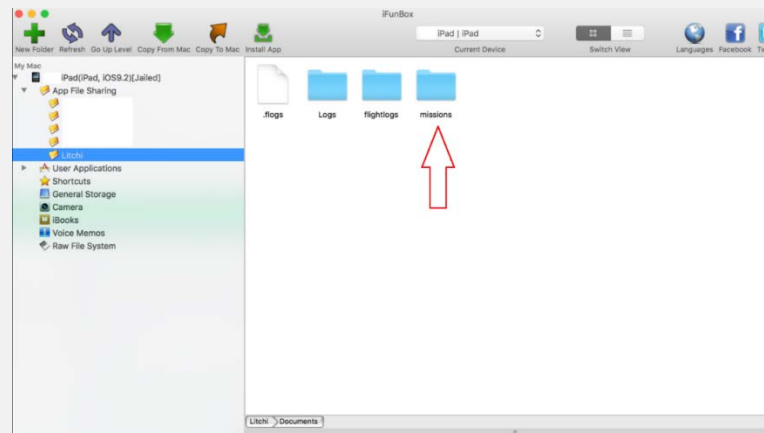
- To load a flight plan inside Litchi for flying, open the Litchi app on your phone/tablet.

- Press the top-left corner icon and make sure you are logged in to your Litchi Account. Also make sure "WAYPOINT" mode is selected. See below:
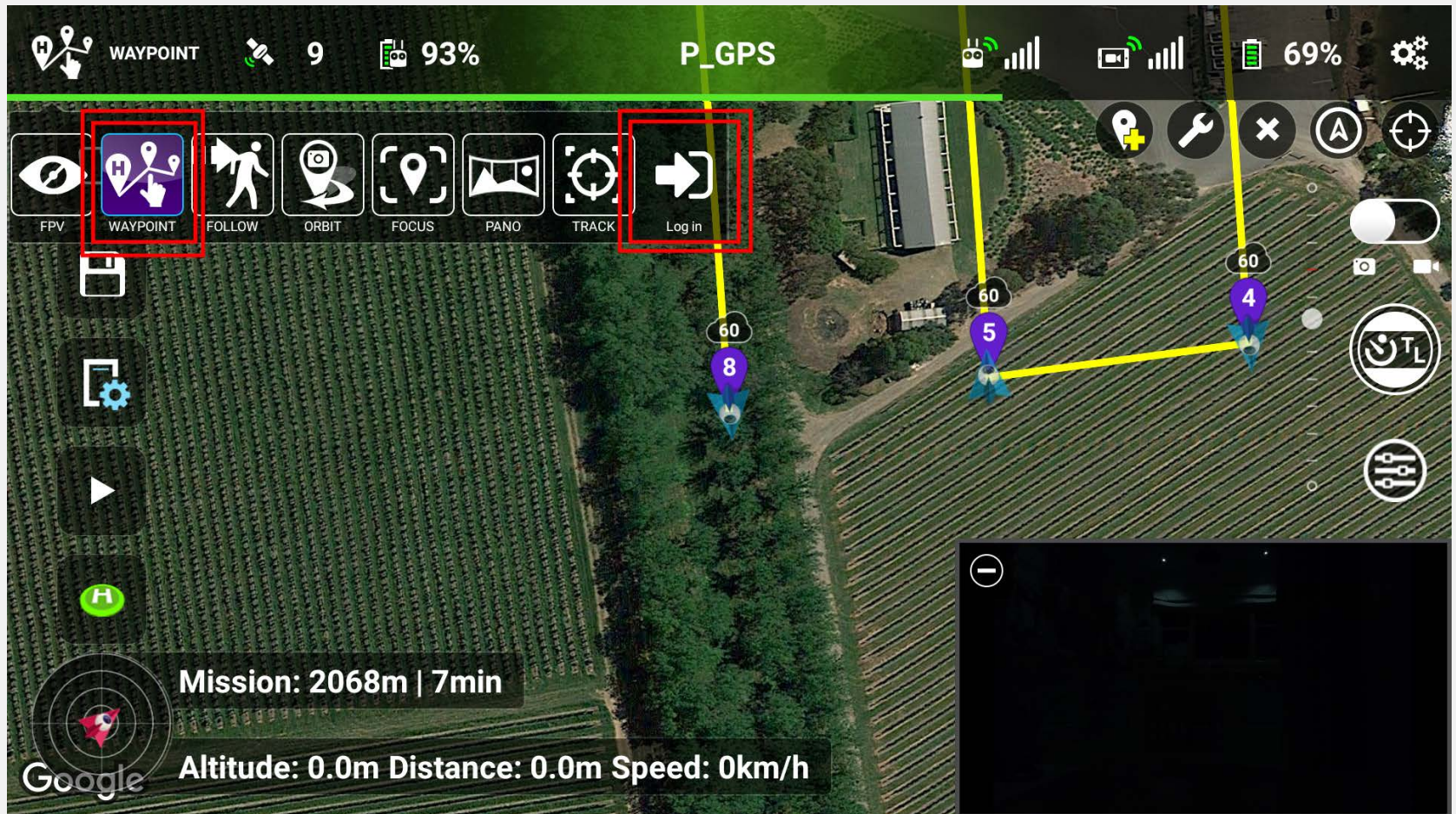
- Press the load icon to select your flight plan file:
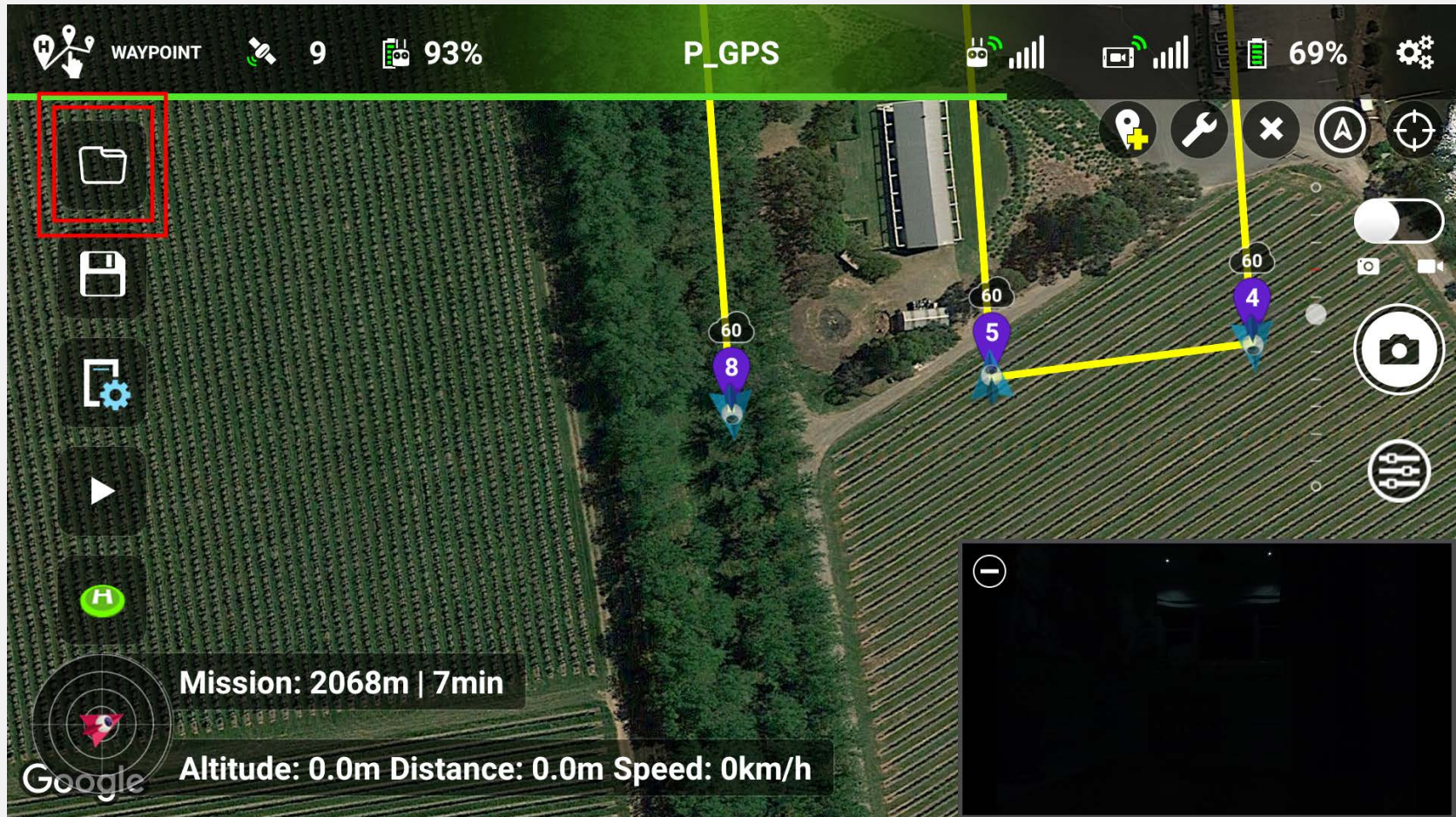
- Choose your flight plan from the list of options that appear.

- Set up the various camera settings to suit your mission (focus, exposure, etc), before starting the mission. These are specific to each drone & mission so are not discussed here.

- **IMPORTANT** – Press "MISSION SETTINGS" and make sure:

  1 - "Heading Mode" is set to "Toward Next Waypoint" (for Android) / "Auto" (for iOS).
  2 - "Finish Action" is set to "Go Home" (so the drone will land at the home / take-off after the mission has completed).
  3 - "Mission Settings" -> "Path Mode" -> is set to "Straight Lines".
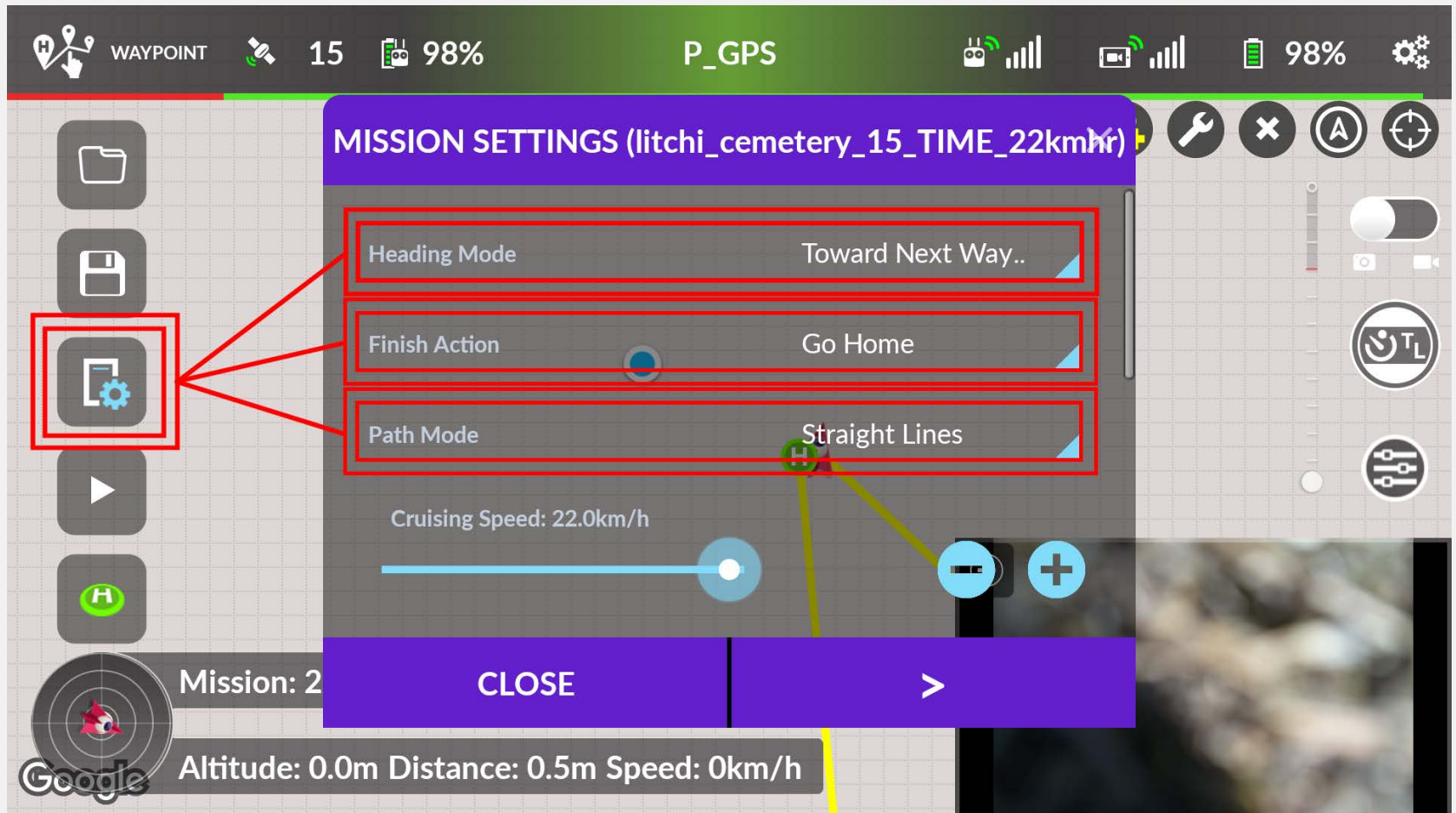
- **IMPORTANT** - if you chose '**position-based**' triggering, follow these instructions ! If you chose **'time-based'** triggering, go on to the next page.

- You start the mission simply by pressing the "PLAY" button on the left-hand-side, and the mission will begin:

- When the mission has finished, the drone will go home & land automatically if the "Finish Action" is set to "Go Home", or, you can press the green & white "Return to Home" button to land the aircraft at the home point:
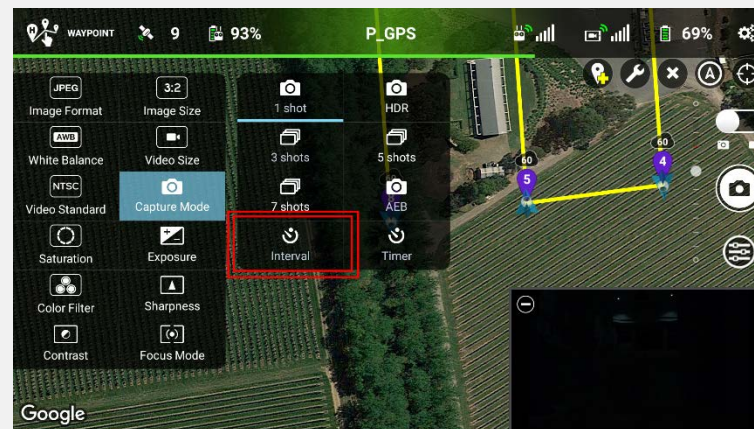

**END OF
POSITION-BASED
TRIGGER MODE
-- GO TO LAST PAGE --**

- **IMPORTANT** - if you chose '**time-based**' triggering, follow these instructions !

- you need to put Litchi into interval capture mode. Press the "Settings" icon on the right-hand-side:


- Press "Capture Mode" and choose "Interval":

- Change the interval settings to match the value in the exported DJIFlightPlanner flight plan (from earlier, see page 10), then press the "Settings" button again to close.
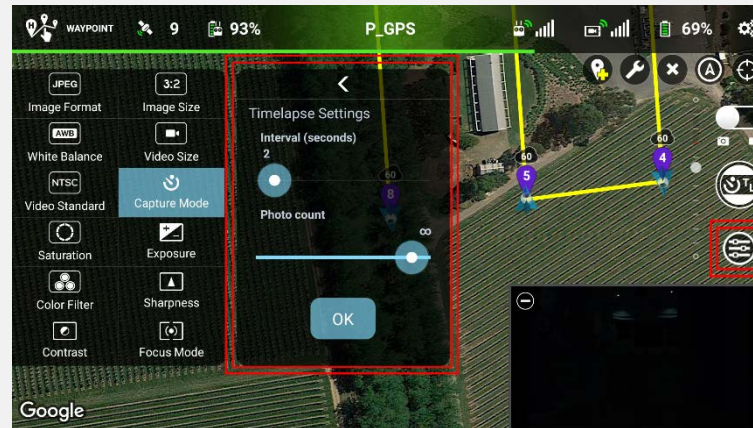

- You will also need to change cruising speed (km/hr) to match the DJIFlightPlanner flight plan so that the camera isn't flying too fast or too slow for the trigger interval. This ensures you will achieve your planned forward overlap %. Make the number as close as possible to the exported DJIFlightPlanner flight plan (from earlier, see page 10):
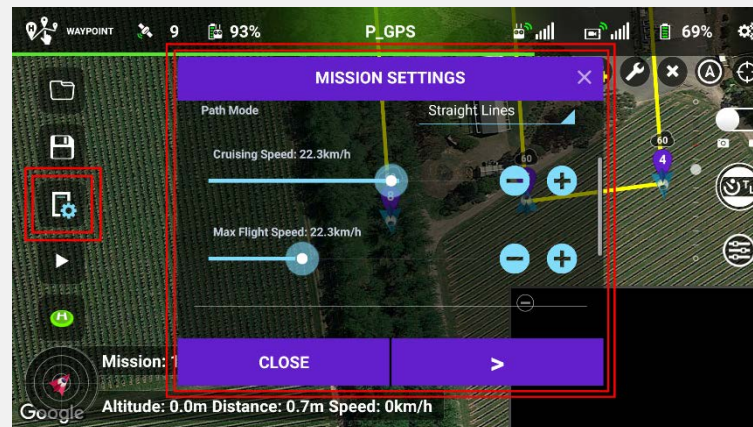
- Now press the "PLAY" button on the left-hand-side to start the mission.

- When the drone reaches the first way point (start of the first flight line), it will pause for 10 seconds. During this time, start the camera triggering by pressing the "TL" button. When the mission has finished, the drone will fly home & land automatically if you have the "Finish Action" set to "Go Home", or you can press the green & white "Return to Home" button to land the aircraft.
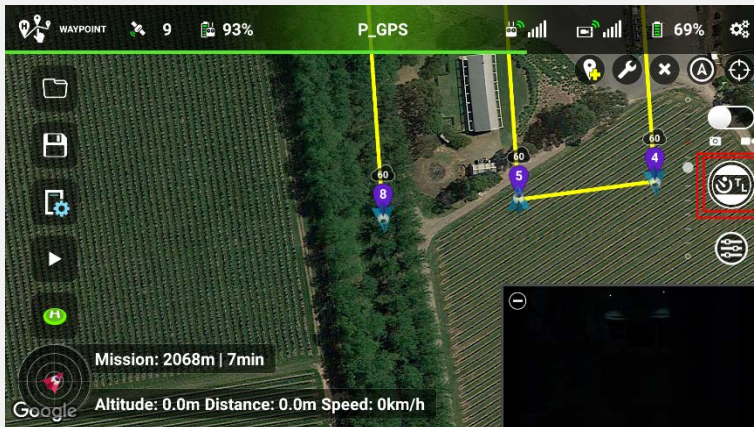
...flying...
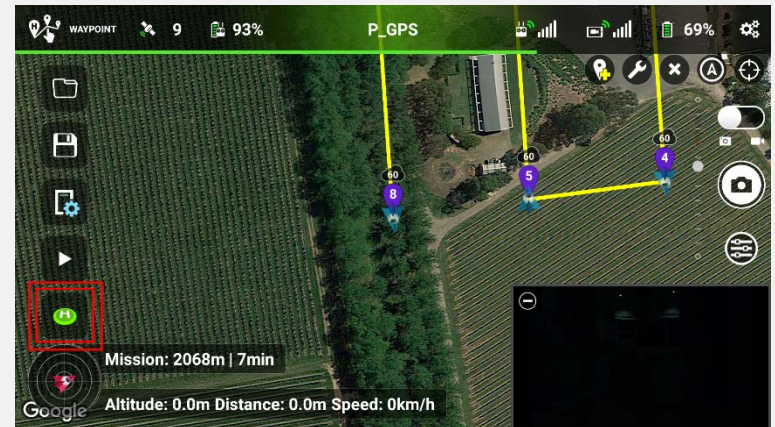
END OF TIME-BASED TRIGGER MODE

Some final thoughts on the best order for system-component start-up ….

- Make sure everything is off to start with.

- Place the aircraft on the ground at your desired take-off location.

- Turn on the remote control first & wait until it's fully powered up.

- Then turn on the aircraft & wait until it's fully powered up.

- Finally, connect the phone/tablet to the remote controller with the USB cable (unless the connection is via wi-fi, then of course the USB cable is not needed).

- Start Litchi and follow the instructions in this tutorial.