

Ara Tūhono

Pūhoi to Warkworth

An NZ Transport Agency PPP Project



Droning on and over and above.



Along with driverless cars and manufactured housing, drones are one of the most high-profile new technologies of the decade. They have become a common sight around our beaches with their amazing filming and photography capabilities, and now they are becoming a common part of the Pūhoi to Warkworth Surveyor's tool kit.

What does the drone do for the project? Until drone technology was available a project of this scale needed teams of surveyors continuously providing volume measurements. This activity would need to happen near to moving equipment. The work by the surveyors would be time consuming and put them at risk from the moving machinery. Much of this is now eliminated using drone technology. The drone is used to capture a three-dimensional (3D) model of the ground that it flies over. This 3D model can then be used to compare against previous models and the computer software will calculate the volume between the surfaces.

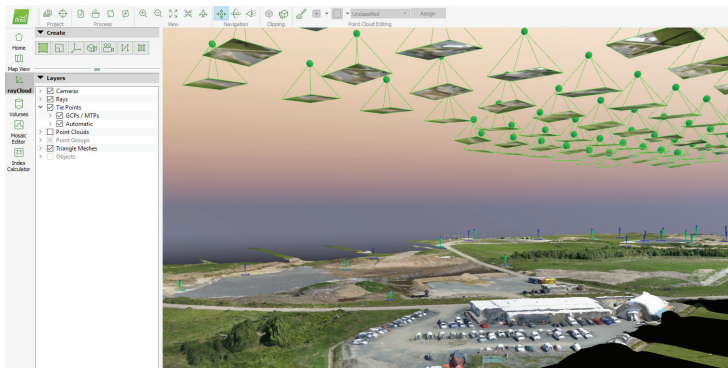
How does it measure the ground? The drone carries a high spec camera which takes still photos every 2 seconds. The drone automatically flies in a grid pattern that is pre-loaded before take-off. The grid ensures that the neighbouring photo has at least 60% of the same image (overlap). We then use the photo processing software called "Pix4D" which stitches the photos together using a method called Stereophotogrammetry – see image below. This software produces a single "Orthomosaic" photo of the area flown, and a 3D "Point Cloud" which contains millions of survey accurate, geolocated points from which the 3D model of the ground can be constructed.

What drone does the Pūhoi to Warkworth project have? The project has two drones - a Phantom 4 Pro for doing small isolated jobs and the M200 for flying the entire project. The M200 also has an aftermarket attachment called PPK (Post-Processing Kinematic). This attachment accurately positions the drone with every photo that is taken, and together with an accurate camera calibration, eliminates the need to put ground control points all over the site.

Innovation and technology are a very important part of major projects like this. Not only can it save on time and cost, but it also encourages our Engineers and Project Teams to think outside the square and to learn new skills.

Ngā Mihi

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