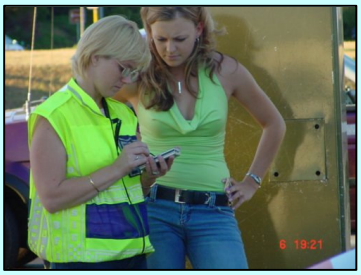
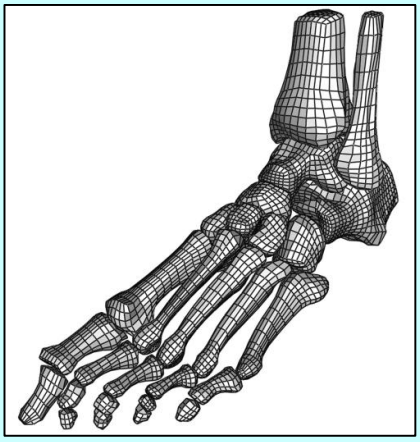
NEWSLETTER





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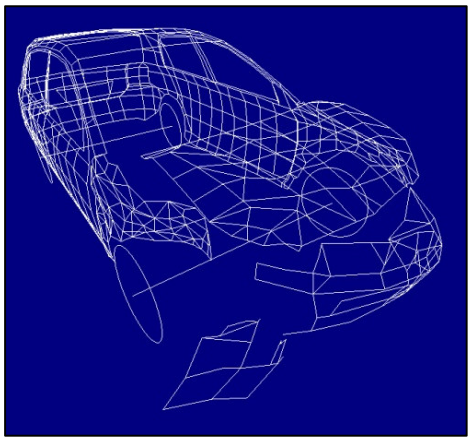
PHOTOGRAMMETRY

As a unit specializing in the use of advanced technologies in Forensic Road Traffic Collision Investigation and Reconstruction, we are constantly exploring new and innovative ways to achieve our presentation goals.

One of the technologies we have used regularly in our efforts to reconstruct and analyze road traffic collisions have been Photogrammetry. This technology is actually very unique and innovative, and enables us to literally “take a vehicle to court” for presentation in evidence.



In a recent case, were able to photograph and model a complete vehicle from real-world photographs and then create a 3D model of the vehicle, showing all the vehicle damage dynamics and crush profile for ease of illustration. As a scaled unit, we could easily use it for real-world measurements months or even years after the vehicle has been repaired, sold, broken apart or even crushed.

Photogrammetry can be best described as Inverse Differential Angular Displacement Measurement of points in 3D space. What this effectively means is that we can measure and determine the position of a point in 3D space through its angular off-set across multiple photographs, since camera calibration allows us to measure angles and distances from the film capture plane (sensor).

Now – the application of this technology is not uncommon in 3D design, building and even the film industry, since it can typically be used by anyone wishing to make a model of an object form photographs. But, we have again done something unique. With all our contacts and exposure, we have never heard of this being done anywhere else, so here’s another first for IBF Investigations:

3D Model of a Crash Scene from aerial photographs

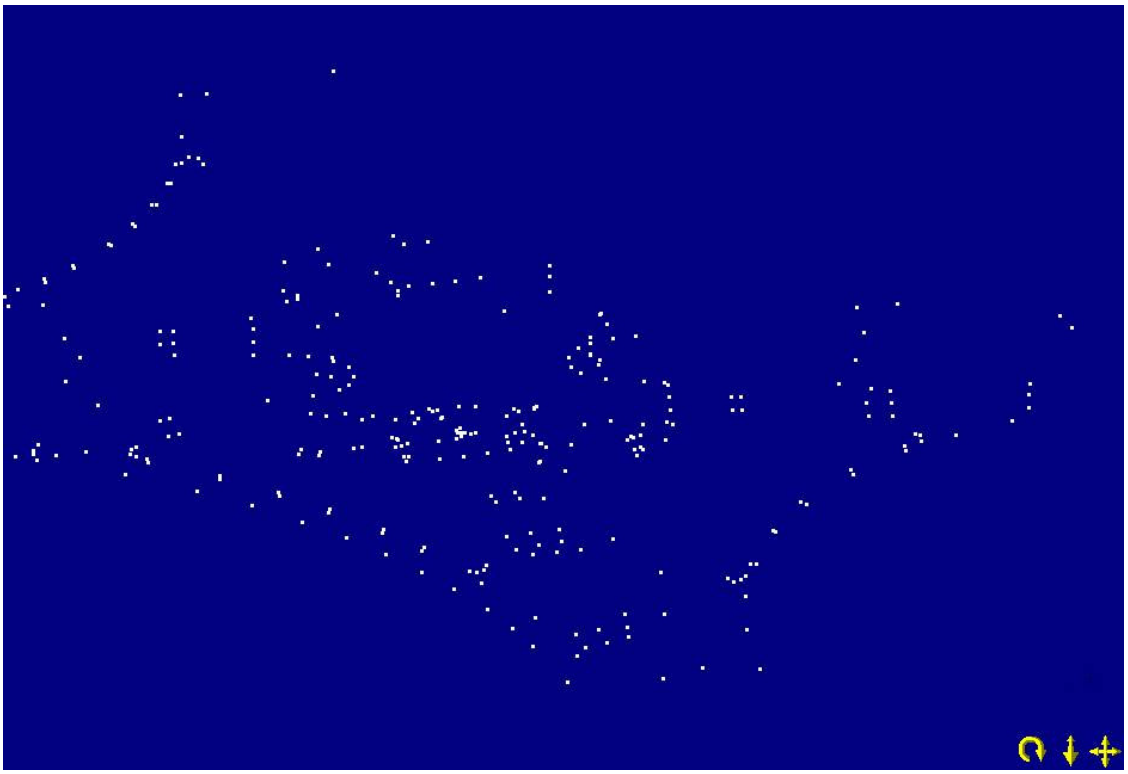
In a recent matter, involving the sad death of two victims, we were appointed to complete a post-event Forensic Reconstruction of the collision, based on available information. As helpful as the South African Police Service's photographs were, we were not in receipt of accurate scene measurements and did not have access to a Total Station or iSite 3D Scanner. But, we did have access to an aerial platform, in the form of a Helicopter.

We promptly closed the intersection in question, with the kind assistance of the SAPS and some Metro Police, and became airborne for the photography process. Now – we had to do this ourselves, since the photography for our software (PhotoModeler) needs to be very specific, we needed to use a calibrated camera and we would be required to testify on the process.

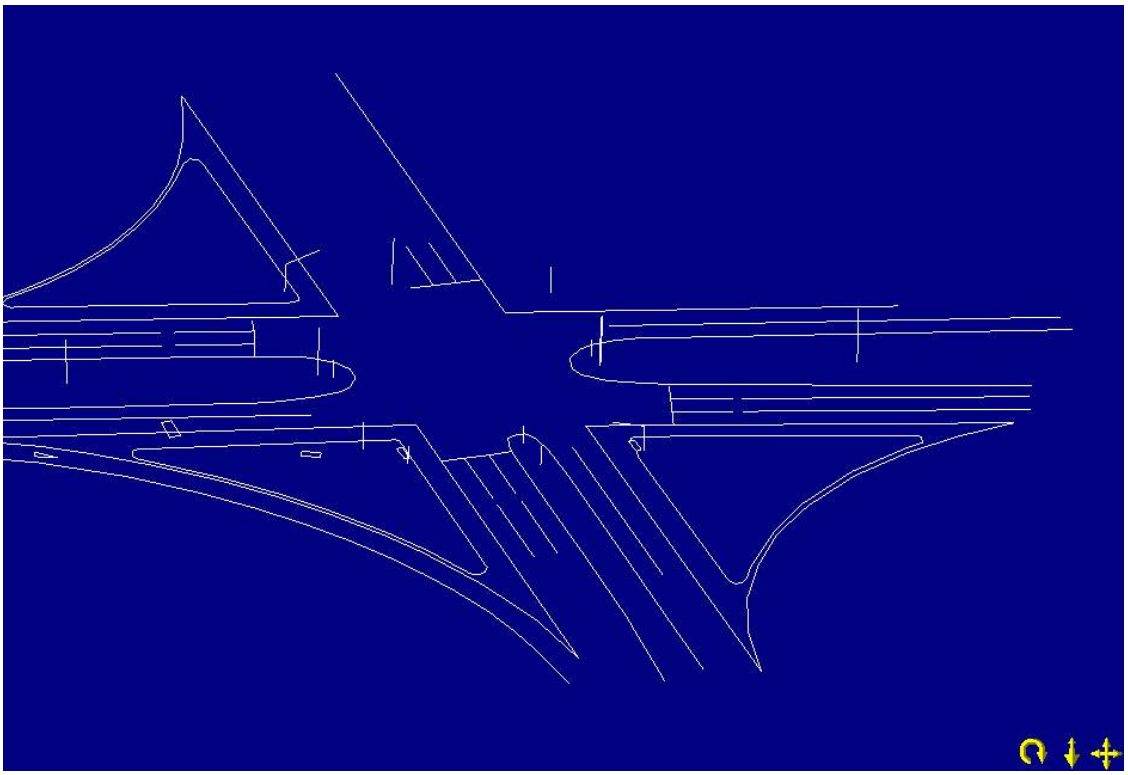
We took a series of photographs from the aerial platform from a variety of angles, and here are some of those very "beautiful" images, if we have to say so ourselves:

Now, from here, we marked a number of common points in as many as eight (yes, only eight) photographs, and began to “reference” these as common points. In total, we were then left with a total of about 1,200 points (as many as 300 per photograph). From this, we were then able to process the project, solve for camera positions and produce what is known as a “point cloud.” This is typically a cloud of points in a D space that we can look around in, swing around, zoom in on, etc. In order for you to grasp the importance of this, we need to point out at this stage that the photographs were taken from as high as about 500 feet, was taken by a digital camera from a moving platform (the helicopter) and that the photographs were taken while hanging half out of the side of the helicopter, since it cannot stand still for too long at the altitudes involved. The points referred to were marked on each photograph, as explained, and each photograph typically looked something like this, with ID tags for all points turned on:

In spite of all these challenges, this process achieved an accuracy of less than 5cm (2 inches) for all points measured, without the need to try to measure each and every point by hand! The total flight took less than ten minutes, and the point-cloud we were able to create then looked like this:

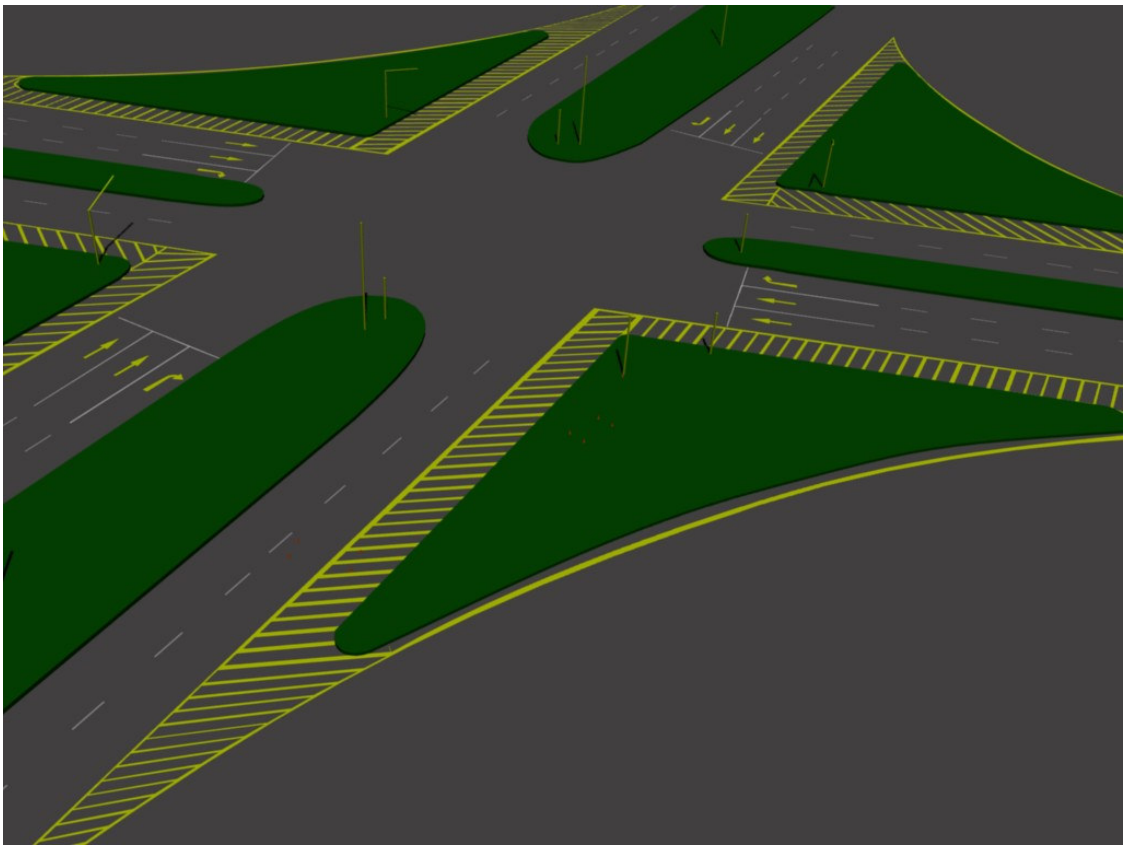


From here, we literally only had to “connect the dots,” and this enabled us to produce an excellent 3-dimensional scale scene drawing that looked like this (with irrelevant elements excluded):

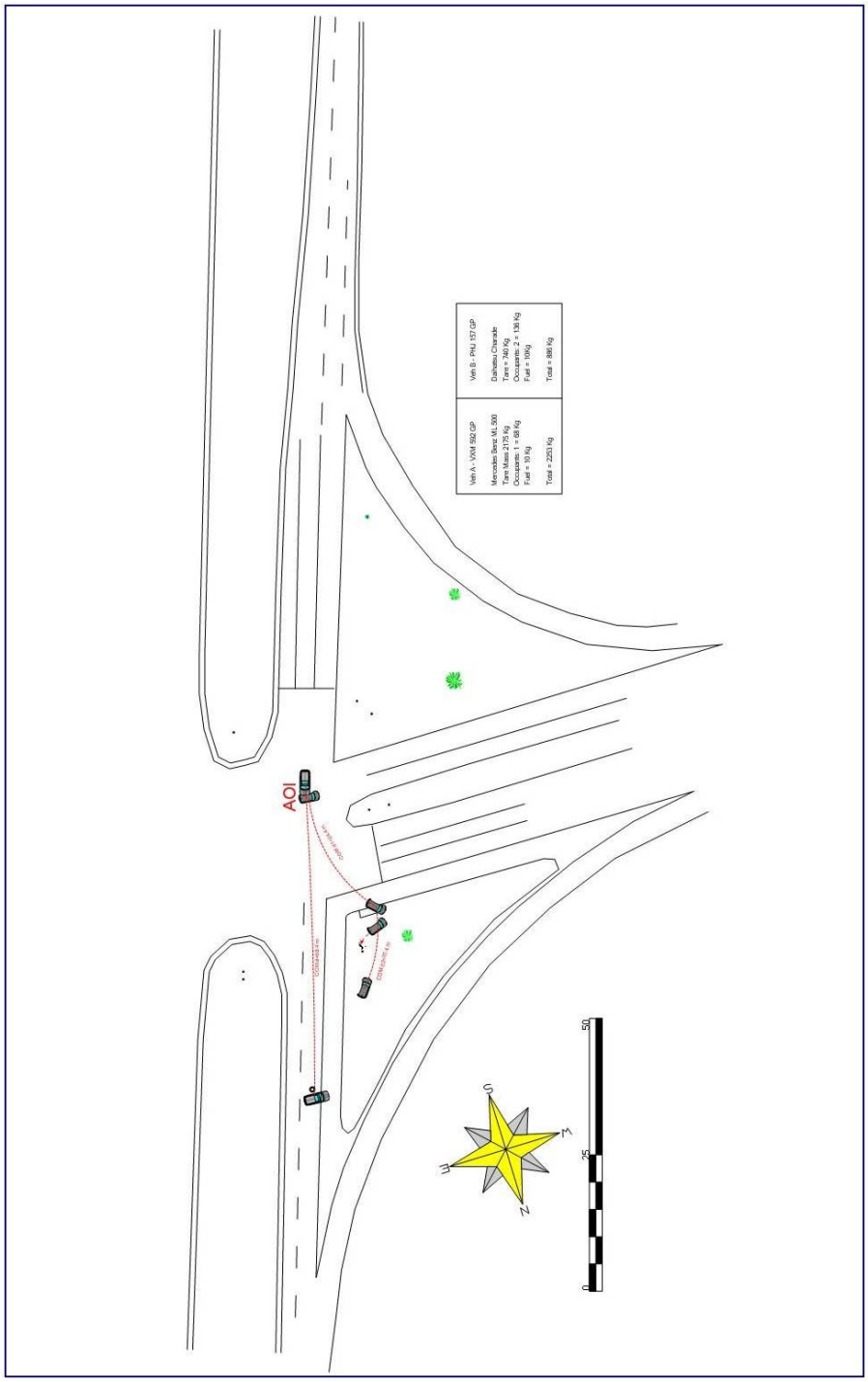


As this image shows, we were even able to include vertical elements, like street lights, traffic lights, signs and sidewalk elevations.

We were then finally able to export all these measurements to yet another 3D package, normally used for the creating of Hollywood-style animations, or for collision animations by us, and then we were able to create an accurate 3D textured model of the scene, which looks like this (with all elements included):



In conclusion, we were also able to export our accurate measurements, done totally in PhotoModeler, to our VistaFx software for speed analysis. The final rendition of the scene was done, and our calculations completed without incident, but with consideration for all aspects of the collision event. Our final Vista Fx scale scene drawing looked like this:



Considering this achievement, and the quality of our work, we want to point out that this technology is something we are very proud of using, that this enables us to move to even greater levels of accuracy in future, where the necessary commitments are required and that we look forward to presenting this evidence in court.

We will send additional updates with the outcome of the court case at a later time…

IBF Investigations is a Forensic Road Traffic Collision Investigation entity with experience at more than 7,500 collision scenes all over South Africa, is owned and run by Stan Bezuidenhout and Jackie Smith and can be reached at:

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