

Documenting urban realities

by Katherine Lehmuller

Indonesia's capital city Jakarta is the largest metropolitan area in Southeast Asia, with tremendous population growth. The population of this megacity grew from 150,000 in 1900 to roughly 28 million in 2010. This megacity increased from 1990 to 2010 alone from 12 million to 28 million, and it seems this growth pattern will continue to increase. All this heavily increases strain on the city's infrastructures, which could possibly cause severe budget problems if not properly managed and is clearly a very challenging task.

Extremely effective methods for collecting asset data quickly, reliably and accurately are available on the market. One such method is using 3D mobile mapping technology, such as Leica Pegasus:Two, offering the first complete mobile mapping system available from one manufacturer. Indonesia's Leica

Geosystems representatives, Almega Geosystems, have been selling mapping equipment since 2008 and demonstrated just how much the city could benefit from the simplicity of this highly accurate mobile mapping solution.

A city the size of Jakarta requires intensive asset management planning to keep on top of the costs of maintaining, operating and replacing heavily used infrastructure such as streets, bridges, road profiles, sidewalks, not to mention other related objects like road signs and billboards. With limited budgets and increasingly limited resources, reliable insight and highly accurate data is the key to reduce risks, properly plan and maintain cost control. Therefore, knowing the exact location and condition of existing assets and also its maintenance history is a must. Reliable data collection provides the framework for a city to better monitor, plan and renovate so it can determine exactly how and where to save on costs.



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To decentralise the population of Jakarta, and thereby ease the stress on the city's infrastructures, satellite settlements were built surrounding the core city in automobile-accessible areas. These settlements are connected by heavily used toll road highways.

The 40-minute drive from Jakarta to Bogor is one of four important toll roads that were designed to connect Jakarta to the Bandung Metropolitan area and help decentralise this quickly expanding city.

Almega Geosystems chose three demo runs using the Leica Pegasus:Two mobile mapping solution. The first demo acquired data on the toll road from the city to Bogor. These demos took place from December 1 to 11, 2014 to roughly 50 potential customers.

What Almega Geosystems did first was demonstrate how easy it was to mount the vehicle-independent device to just about any rail, car or boat with a mounting rack. In only a few minutes, the unit was

set up and ready to go. The Jakarta-Bogor toll road is an extremely busy urban highway and the Leica Pegasus:Two offered vehicles the major benefit of collecting reliable data at the posted speed – the same speed as the surrounding traffic was moving – and not blocking traffic. Reliable point clouds were collected using seven cameras and a LiDAR scanner to create 360 degree views of the area with just one trip through the designated area. The optional rear camera was also used to collect data to analyse pavement cracks and potholes.

From inside the car, a laptop using Leica Pegasus data capture and software and ArcGIS, instantly created highly detailed, survey-grade 3D point cloud data containing the exact time and location of the data collection from road surfaces, road signs, poles, curbs and reflectors – anything that came into view.

The second demo was completed on from the National Monument and Capital Road area. The team collected



3D data of road and sidewalk surfaces, drainage culverts, building assets and billboards. They could extract information such as distance measurements from structures, building facades or roadway lines, make road profiles including the sidewalks, all of this supported by highly detailed images combined with precise and reliable GNSS measurements.

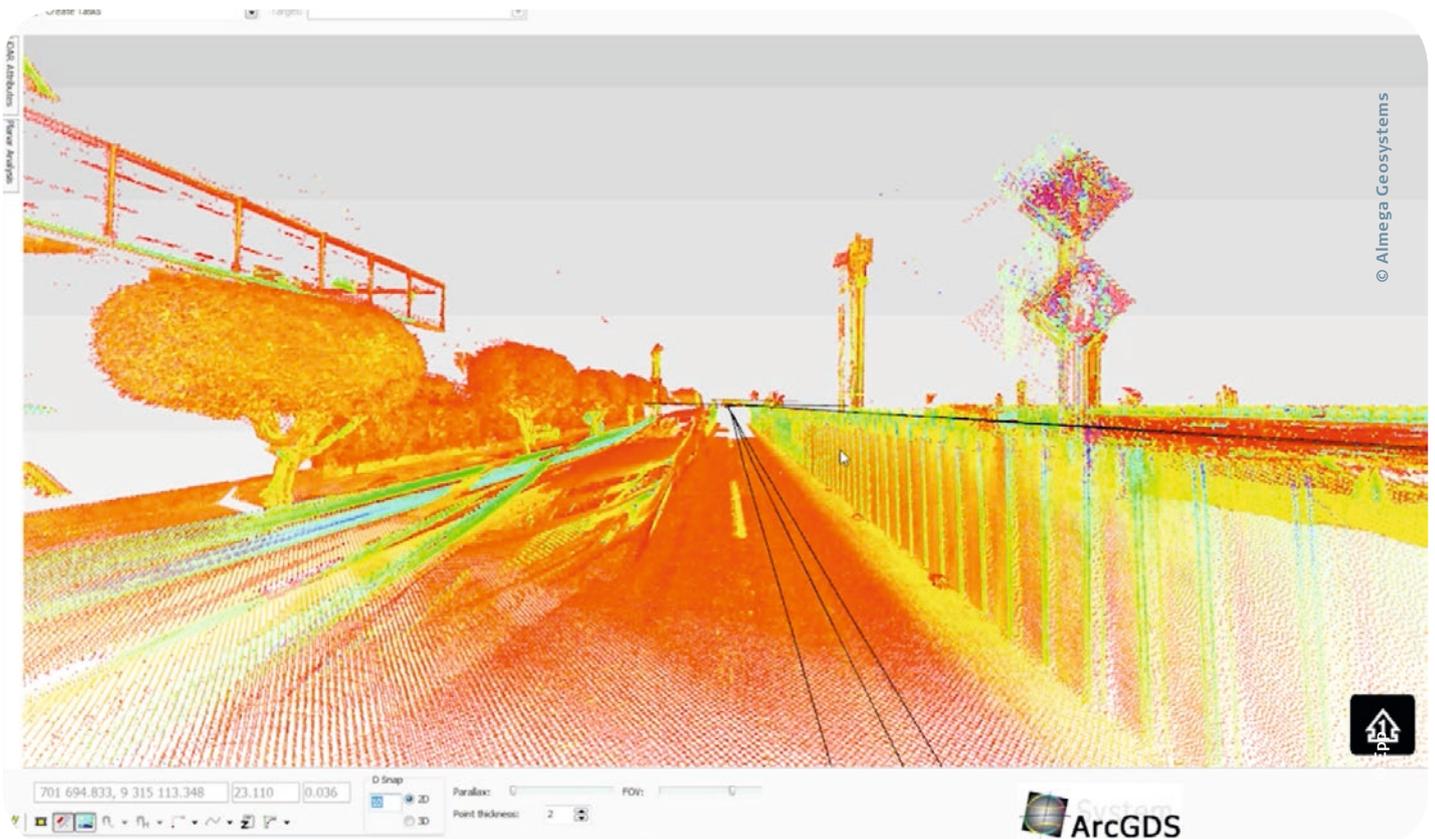
The third demo data acquisition took place in the Alam Sutera area, another of the satellite settlements surrounding Jakarta. The goal here again was to acquire data from road surfaces and signs, sidewalk profiles and for use in building asset management with just one simple collection and have all asset information collected for post-processing.

The reaction of the audience was very positive. Busroni Arif Yanto, from Almega Geosystems explains, "They liked the unit's durability, given that it rains a lot during monsoon season, this is a major plus. Also, because captured data can be viewed instantly en route, to make sure everything is there as wanted and to be able to automatically extract data like road

lines, pole heights, diameters or position. Pavement analysis was also a big plus. The Leica Pegasus:Two automatically records road level changes so they could quickly see the extent of the road's deformation and cracks. This helps road maintenance repair crews know exactly where to go and what to do. A big help for organisation and planning."

In Indonesia, Leica Pegasus:Two isn't just liked for its user-friendliness, customers also know of Leica Geosystems products and hold them in very high-esteem. Busroni Arif Yanto finishes by adding "Leica Geosystems products have a reputation here for being the best, the easiest, the most reliable. We've added to this Almega Geosystems' local technical support and services – and this is a combination that's very hard to beat."

With Jakarta's growing population showing no signs of ceasing any time soon, the city will need a solution like Leica Pegasus:Two to successfully manage the challenging urban realities of its assets and road management. ■



■ Pointcloud of the street and its surroundings captured with Leica Pegasus:Two.