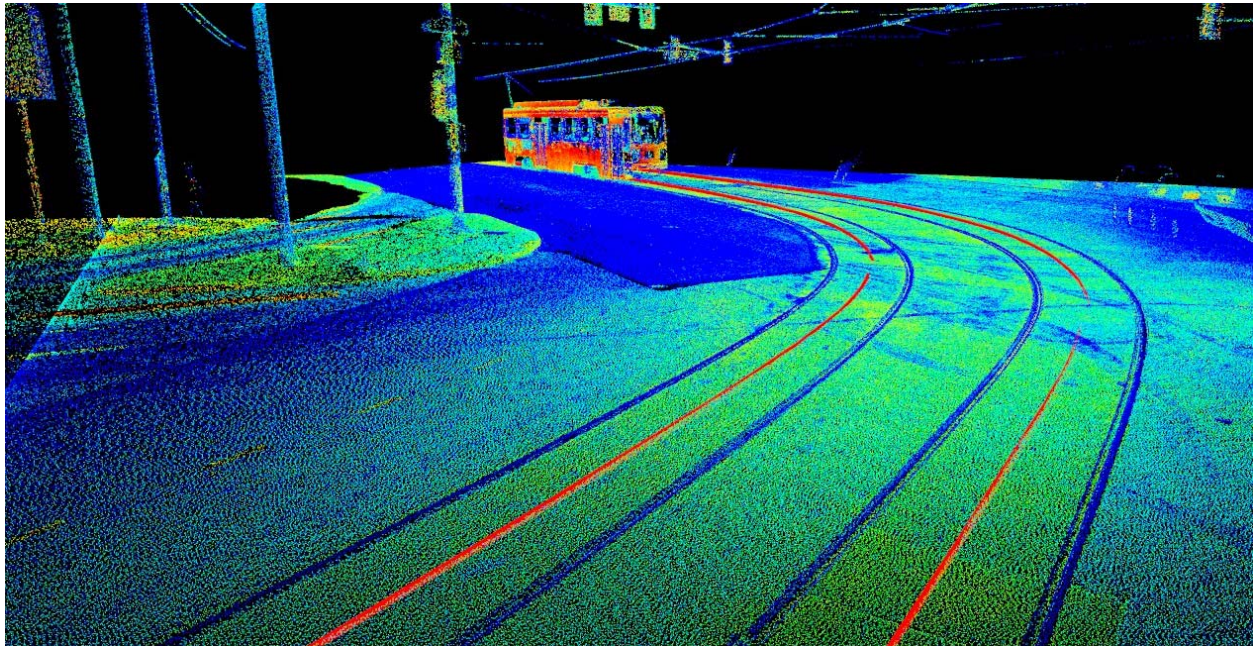


## THE GROWTH OF MOBILE LiDAR MAPPING

January 23, 2016 || Gene Roe



### Introduction

The use of mobile LiDAR systems to map and document the condition of horizontal infrastructure, as well as the associated assets has moved out of the early adopter stage and it is now beginning to cross over into a much larger market. From its early days of being used to locate improvised explosive devices (IEDs) for the military in Afghanistan to today where the technology is now capable of acquiring over 1 million, highly accurate three dimensional points at highway speed per sensor, the technology has certainly matured to the point where it can be relied upon to produce predictable results. That is, if it is being operated by a knowledgeable technician that understands its capabilities and perhaps more importantly, its limitations.

## Maser Consulting P.A.



One of the firms that is at the forefront of the application of mobile LiDAR mapping of transportation infrastructure is Maser Consulting P. A. With headquarters in Red Bank, New Jersey, they have over 600 employees working primarily along the east coast with one office in New Mexico. The Firm is a privately owned, multi-discipline, engineering firm with a unique balance of public and private sector experience.

Maser Consulting has been in the terrestrial laser scanning business since 2010. They acquired the RIEGL VMX – 450 mobile mapping system, which includes two scanners as well as an IMU and GNSS equipment in June of 2013. The system includes RiACQUIRE, RiPROCESS and RiPrecision software to manage the data acquisition and post processing workflows.

In 2015 Maser Consulting hired Paul DiGiacobbe, PE, DBIA as the Director of Geospatial Services for the firm. Paul's experience with 3D laser scanning went back to 1999 when he first saw a demo of an early Cyrax scanner while he was working for Bentley Systems. It was some ten years later that Paul first saw a demo of a mobile LiDAR system.

In 2009 Mike Frecks, the founder of Terrametrix convinced Paul, who was working for HNTB at the time to do a pilot project. Paul noted, "A lot of questions remained, but we could see the potential of the technology."

The pilot led to a multi-year investment in researching and developing the application of the technology through HNTB's Incubation Center. Paul recalls, "One of the people who got heavily involved in the research was Chris Siebern. His mantra was that the technology had to be repeatable and reliable. Eventually we were able to achieve this which resulted in an industry-leading specification that HNTB uses to tightly control the contracting out of the actual mobile LiDAR data collection for their transportation projects."

## **Case Studies**

One of the more interesting projects that Maser Consulting has recently completed involved the acquisition of 100 miles of trolley track. The contracting agency need to document the 3D clearances so that they could maximize the dimensions of the replacement vehicles without having to make a lot of changes to the existing infrastructure. They had only one month to complete the acquisition with daily collection windows being very limited.

"With such a tight schedule the system reliability was critical," Paul commented. "The VMX-450 performed flawlessly. The integrated, modular design allows us to move the system, not the individual components from one vehicle to another with a minimum of calibration issues. This helps to insure the reliability and repeatability (mentioned earlier) that the client expects us to deliver."

One of the divisions of the Florida DOT is taking the lead in the use of mobile LiDAR. In fact, the point cloud data is being supplied to the bidder as part of the design package. "We rely heavily on Riegl software suite to streamline our workflows," Paul noted. "With some other mobile LiDAR systems, it can take multiple software packages to acquire and post process the data to the point where we can deliver it to the client. We do 80 to 90% of work in the Riegl packages."

"When we do come across a problem it is usually related to bad control," Paul explained. "The RIEGL software is very powerful when it comes to identifying where the problem is with the control. This saves us a lot of time and frustration."

"We used the system virtually every day in the second half of 2015. The support from RIEGL USA was fantastic – we could not have done it without them," Paul explained.

## **The Future**

Looking down the road, Paul sees an important role for a UAS that can support engineering grade survey data collection largely to overcome the issues with traffic and accessibility. Airborne data collection does not have this limiting constraint. He noted RIEGL's RiCOPTER and VUX products as possible solutions.

He also believes there will be expanding opportunities for mapping grade mobile LiDAR data collection with the FHWA mandating the use of asset management at the departments of transportation in the U.S.