Geophysical Research Abstracts, Vol. 8, 01219, 2006
SRef-ID: 1607-7962/gra/EGU06-A-01219

Integration of GPS and laser scanning technology in a bridge case study

M. Hawarey (1), B. H. W. van Gelder (2), J. S. Bethel (2), A.F. Cetin (2), A. Sampath (2)

(1) GeoTech Consulting, Riyadh, KSA, (2) Purdue University, West Lafayette, IN, USA (mhawarey@ags-group.com / Fax: +966-1-293-1495)

Both technologies of Global Positioning System (GPS) and Laser Scanning (LS) have witnessed tremendous improvements during recent years. In this study, Bridgeport bridge located nearby Indianapolis International Airport in the state of Indiana, USA, was scanned on September 26, 2002 just before the scheduled time of its demolition. The enormous amount of data collected, i.e. 2,756,495 points, was processed using manufacturer's own software package, which required the availability of control points to register various scans on each other. These control points were marked and surveyed later on using GPS. This allowed the registration of the point cloud to UTM (NAVD83), and thus overlapping it onto another point cloud that was provided by Indiana Department of Transportation (INDOT). As a result, it became possible to quantify the quality of the GPS registration of all these points. While the maximum horizontal error was found less than 4 cm, maximum vertical error was found equal to 1.5 cm. The ability to make fly-through movies along the highway, beneath the bridge and over it, proved to be very helpful representation tool.