4.2.2 Integrating/Extracting Geopspatial in a Stereo Base Map Environment for Transportation Corridors

Presenter
John E. Matthews, PLS
HSA Consulting Group,Inc.
jmatthews@hsa.cc

Co-Presenter

Utilizing remote sensing as an accurate stereo base map for use in a GIS/CAD environment forms a substantial platform for interactive use by a myriad of multi-discipline operations. Using stereo base maps for three dimensional (3D) data extraction allows for the creation of accurate 3D GIS/CAD data sets, overcoming many of the accuracy challenges of typical geographic information systems. Increased accuracy results in expanded usability of the data sets by multiple disciplines for multiple purposes. Stereo imagery creates a real world visual environment and allows for intelligent analysis of 3D vector data residing on a stereo image as an enhanced backdrop. Stereo base maps also provide Q/A Q/C processes that allow a visual environment to qualify existing data sets and resolve issues and conflicts without field visits to the project site or study area. This paper explains how multiple disciplines utilizing GIS/CAD and Remote Sensing can create new highly accurate 3D GIS/CAD data layers and utilize them in Photogrammetric applications. Specialized tools have been developed for viewing and extracting data from Geo-Spatial Digital Base Maps to update the Florida Department of Transportation's, District 3 (FDOT D-3) roadway inventory and associated Straight Line Diagrams (SLD's) without the need for data collection on the roadway. These new tools allow for a safer and more accurate way of collecting data with the residual benefit of 3D color stereo images usable for many other purposes. Three-dimensional digital images, for over 2,000 miles of on-system roads are now being centrally-served and used throughout FDOT D-3 in multi-discipline offices, i.e. Planning, Surveying and Mapping, Right of Way, Environmental Management, Maintenance, Design, etc. A customized tool for the collection of 3D survey-specific roadway features using, standard procedures and file formats consistent with the Electronic Field Book (EFB) has been developed and is being utilized for FDOT Resurfacing, Restoration and Rehabilitation (RRR) projects and other planimetric feature extraction projects throughout the country. This application, SurveyCreator, generates output file formats, which can be directly imported into roadway design applications such as CAiCE and exported into CAD or GIS environments such as MicroStation, AutoCAD, ArcMap, etc. Data extracted using this tool provides the foundation geodetic feature, and chain data for various design projects and development of triangulated irregular networks (TIN's) and full digital terrain models (DTM's). These stereo images can also be utilized throughout the community to meet requirements in other disciplines. This paper addresses "Integrating GeoSpatial Data" with today's applications by combining GIS, Surveying, Planning and Photogrammetry in producing 3 Dimensional Stereo Base Maps capable of desktop data extraction. Development of these new applications allows a multitude of disciplines to utilize the same mapping information for more consistent GIS/CAD, mapping and planning applications and has the additional benefit of reducing the time and expense for acquiring positional data in the field.