

## **1. ICT in Management of Finished Tunnel Shape - MMS Measurement in Mountain Tunnel -**

Atsushi Takao, Katsumasa Kurata, Iwao Miyata

The efforts associated with “The Trial Procedure of Measurement of Finished Tunnel Shape Using Laser Scanners (draft)” related to the draft of the CIM Introduction Guidelines formulated by the Ministry of Land, Infrastructure and Transport seek to advance the use of laser scanners (LS) to perform measurements in place of tapes, measurement rods, and aerial work platforms in current measurement of finished tunnel shape to accelerate work and improve safety. LS measurement makes it possible to acquire planar data expressed as three-dimensional point clouds. Comparing the acquired three-dimensional point clouds to three-dimensional design data enables planar management of finished tunnel shape and calculate turnover. In addition, in a new effort, a mobile mapping system (MMS) was used to make three-dimensional point measurements of finished tunnel shape. Superimposing the three-dimensional point cloud data acquired by measurement on the CIM model made it possible to visualize work information.

Entering the work progress measurement information into the CIM model should allow confirmation of work histories at the maintenance management stage. Additionally, since the model will contain information on nonvisible sections, it can be utilized at the maintenance management stage as a database.

**Key words:** CIM, three-dimensional point cloud, management of finished tunnel shape, MMS