

IP-S2 for Infrastructure Assessment

The Center for Highway Asset Management Programs (CHAMPS) at Virginia Tech is conducting research for the Virginia Department of Transportation using Topcon's IP-S2 mobile mapping system to determine the location and condition of roadside assets.

Topcon's IP-S2 is a vehicle-mounted, mobile 3D precision mapping and survey system that combines dual-frequency GNSS signal tracking and positioning and inertial measurement to integrate laser scanning and digital imaging.

Dr. Jesus M. de la Garza, CHAMPS' director, and the Vecellio Professor in Civil and Environmental Engineering, is being assisted by graduate students Dimitrios Sideris and Grant Howerton in the execution of the research.

CHAMPS' researchers are utilising Virginia Tech's Smart Road facilities to conduct the experiments. The 2.2 mile Smart Road features weather-making capabilities (rain, snow, fog), a variable lighting test bed and pavement markings. Additionally, the Smart Road has an on-site data acquisition system, road weather information systems, a differential GPS system, road access and surveillance, and a signalised intersection.

Accurate vehicle positions are obtained using three integrated technologies: a dual-frequency GNSS receiver establishes a geospatial position; an Inertial Measurement Unit (IMU) tracks vehicle position; and a connection to the vehicle CANbus or external wheel encoders obtains odometry information. These three technologies work together to sustain a highly accurate 3D position for the vehicle even in locations where satellite signals can be blocked by obstructions such as buildings, bridges or tree lines.

Dr. de la Garza said he subscribes to the notion, "what gets measured gets improved - but with a twist," he said. "What gets measured efficiently and effectively gets improved. With the technologies working together in the IP-S2 we are able to quickly get data in areas where traditional efforts of man-powered crews have proven to be time-consuming, costly and potentially unsafe."

<https://www.gim-international.com/content/news/ip-s2-for-infrastructure-assessment>
