# Galileo Satellites to Enable More Efficient Cadastral Land Surveys

Researchers have received a H2020 grant to further improve the availability of the Galileo system and to integrate land surveys in the cadastral workflow. With this new European global navigation satellite system (GNSS), cadastral measurements can be conducted real time in the field. This possibility for on-field boundary determination makes conducting cadastral surveys more efficient.

Researcher Edward Verbree explains: “Every system has its own accuracy. For most applications, accuracy to a few metres is perfectly agreeable. For cadastral applications however, every centimetre counts. With this new system, we can easily achieve centimetre accuracy and measure quickly, too. That means the system can actually be used in the field to provide correct and fast data.”

Europe’s GNSS, dubbed Galileo, provides improved positioning and timing information with positive implications for many European services and users. For example, Galileo allows users to determine their exact position with higher accuracy than what is offered by other available systems such as GPS. With a development period of over 20 years and a € 22.2 billion estimated investment, Galileo is one of Europe’s largest projects.

## Boundary determination

The ‘Galileo improved services for cadastral augmentation development on-field validation’ (GISCAD-OV) research project received a € 3.4 million European Commission H2020 grant to overcome current limitations within the system. In doing so, the project paves the way for the exploitation of further opportunities in cadastral land surveying. The new high-accuracy services for Galileo create up to five-centimetre accuracies, with quick measurement times of two to five minutes. This allows for correct and fast measurements in the field, making the improved system an excellent tool for land surveying. The provided information can be used by the cadastral sector for, amongst other things, parcel subdivision, boundary determination, boundary reconstruction, new building insertions on maps and updates of coordinate reference systems. Boundary determination and reconstruction, for example, are used to settle disputes, or in case of disaster recoveries after an earthquake or tsunami.

## Land Administration Domain Model

The TU Delft portion of the research focuses on standardization and regulation of encoding survey data and cadastral workflow. Researchers Peter van Oosterom and Edward Verbree aim to integrate the existing Land Administration Domain Model (LADM, ISO standard 19152) within the project. This data model aligns land administration design with technological developments, providing a standardized global vocabulary for land administration. By combining LADM with the improved Galileo services, cadastral land surveying will not only be significantly improved, but will also become available for free or at low cost throughout Europe. The reduced costs and the democratization of the connected hardware and software will improve the service as a whole.

The GISCAD-OV project is conducted by a consortium of 14 partners, including TU Delft: Geoweb, Exagone, Instituto Geografico Nacional, Sogei, University of Padova, Geo++, Novatel, York University, Geoflex, Telespazio, VÚGTK, CLGE, and Roma Tre University. The H2020 project will be conducted over the next three years, with a total budget of € 3.4 million. It is the first H2020 SPACE project in which TU Delft participates.