

Customer Story

# Working with Fraunhofer IPM, Trimble's Applanix POS LV with POSPac Seamlessly Integrates into Customized Vehicle for Highly Accurate Mobile Mapping



# Overview

Founded in 1949, the Fraunhofer-Gesellschaft is the world's leading applied research organization. Operating 76 institutes and research units throughout Germany, Fraunhofer prioritizes key future-relevant technologies and applications in business and industry. The Freiburg based Fraunhofer Institute for Physical Measurement Techniques IPM is focused on developing and delivering optical measurement systems for different applications, including detailed mobile mapping solutions.



NO OF INSTITUTES & RESEARCH UNITS THROUGHOUT GERMANY

76

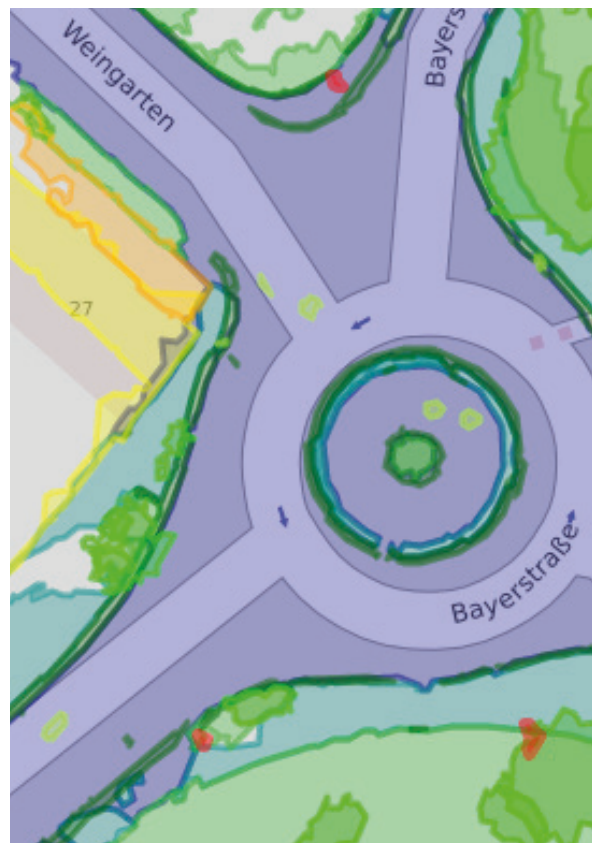
LOCATION ACCURACY ACHIEVED

1 cm

# Challenge

## A Complex System to Capture and Post-Process Mobile Mapping of Roads

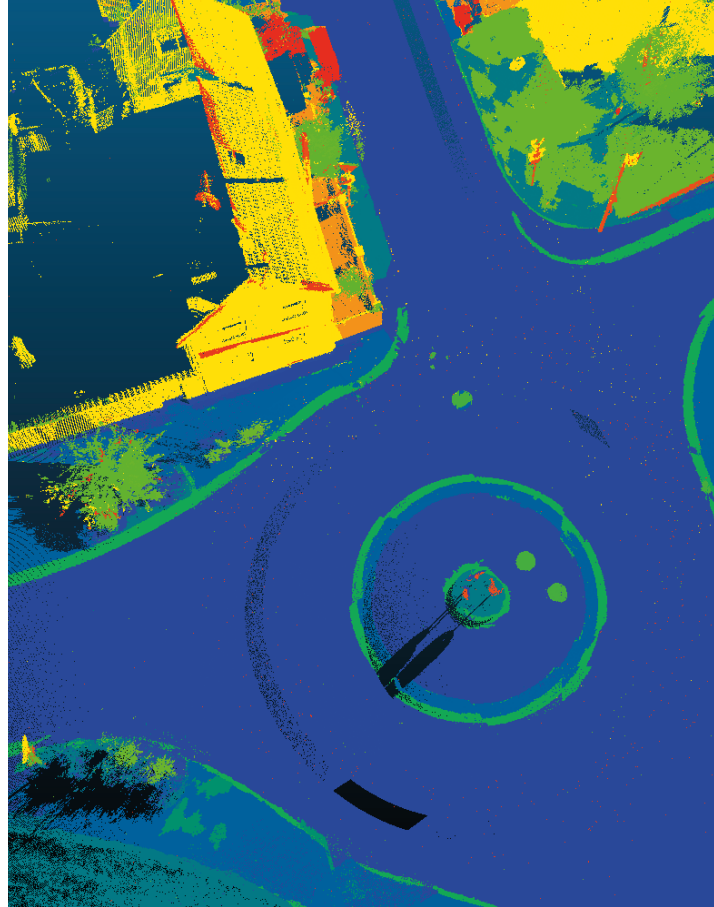
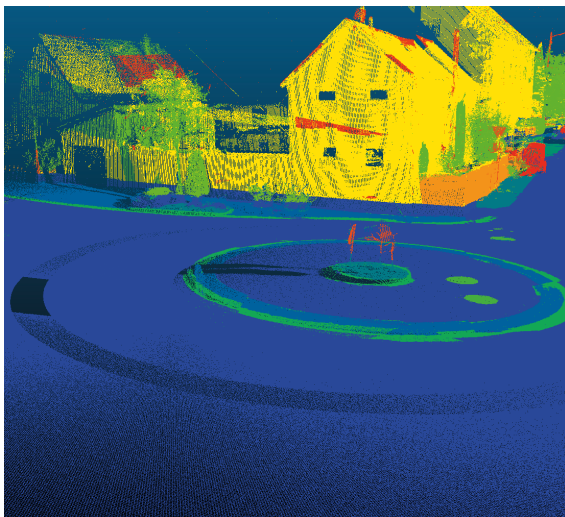
Fraunhofer IPM is working with the leading European telecommunications company, Deutsche Telekom, to create precise maps of urban streets with detailed surface information. To achieve this goal, Fraunhofer IPM custom built a measuring system utilizing four cameras and a LiDAR system. Installed on the roof of a measuring vehicle, the system captures mapping and surface data of urban roads and surface areas. This detailed mobile mapping data is used by Deutsche Telekom to understand the surface area of urban environments, in order to optimize the planning for new fiber-optic cables.





Enhanced location sensing was achieved using Trimble's Applanix POS LV, a compact, fully integrated, turnkey Position and Orientation System, utilizing integrated inertial technology to generate stable, reliable and repeatable positioning solutions for land-based vehicle applications. A location accuracy of 1 cm was achieved. Applanix POS LV is designed to operate under the most difficult GPS conditions found in urban and suburban environments and is proven technology for providing accurate geo-referencing for road geometry, pavement inspection, GIS database and asset management, road surveying, and vehicle dynamics.

The Mobile Urban Mapper (MUM) by Fraunhofer IPM relies on cutting-edge hardware and uses deep learning strategies for automatically interpreting the surface data. The goal is to procure precise surface data including accurate location. With its four commercial cameras and a high-end LiDAR developed by Fraunhofer IPM, the vehicle is mapping the environment quickly and precisely at 2 million measurement points per second. Fraunhofer IPM integrates all sensor systems to achieve a timestamped data stream. After capture, the data is transferred via removable storage media to the cloud for processing in order for Fraunhofer IPM to immediately utilize the data stream.



## Approach

### Cloud Based Solution Efficiently Delivers Mapping Data

Fraunhofer IPM needed a more efficient option for retrieving data captured from the software and hardware within the vehicle. The other challenge was to ensure the camera and location data are time stamped and synchronized. The time stamp comes from the Applanix GNSS receiver, and triggers the cameras so the two timestamps are aligned. Additionally, Fraunhofer IPM relies on Applanix POS Pac to process the data, and is able to deliver a precise and highly accurate 2-D map or 3-D model.

Trimble's Applanix products offer a complete processing sequence. It is easy to integrate with a very strong software component that can be delivered directly to the customers.



says Alexander Reiterer, Head of Department Object and Shape Detection at Fraunhofer IPM.

# Solution

## A Successful and Innovative Application

The first mobile mapping vehicles to deliver urban road and surface data were delivered to Deutsche Telekom in 2021.

Niko Gitzen, Business Owner FTTH Factory at Deutsche Telekom states,



The speed at which we can generate a 2-D map of an urban area has significantly impacted our business. We can now go from capturing mobile mapping data to planning for fiber optic cable lines within days, rather than weeks or months.

Fraunhofer IPM continues to build this application into vehicles, creating highly accurate mobile and surface mapping solutions for urban surroundings.



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