ATR TRACK III: THE REAL – TIME GPS FOR PUBLIC SECURITY

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ABSTRACT

In the project a system was developed, that visualizes real time GPS navigation data over the public security system. Vehicles equipped with a GPS/GSM unit can connect to the security system via internet and multiple viewer users can track their motion in real-time. A client-server system passes GPS position data from the vehicles on the GIS editor and vector/raster MultiViewer application.

ATR Track III EQUIPMENT

System has 3 functional modules:
- GPS / GPRS / I/O integrated unit with 16 channel GPS receiver, GSM/GPRS modem and digital input/output for optional sensors (i.e. alarm signals Fig.2)
- MultiViewer GPS Server – central unit for system monitoring (Fig.1 and Fig.3)
- MultiViewer GIS Integrator console (Fig.4)
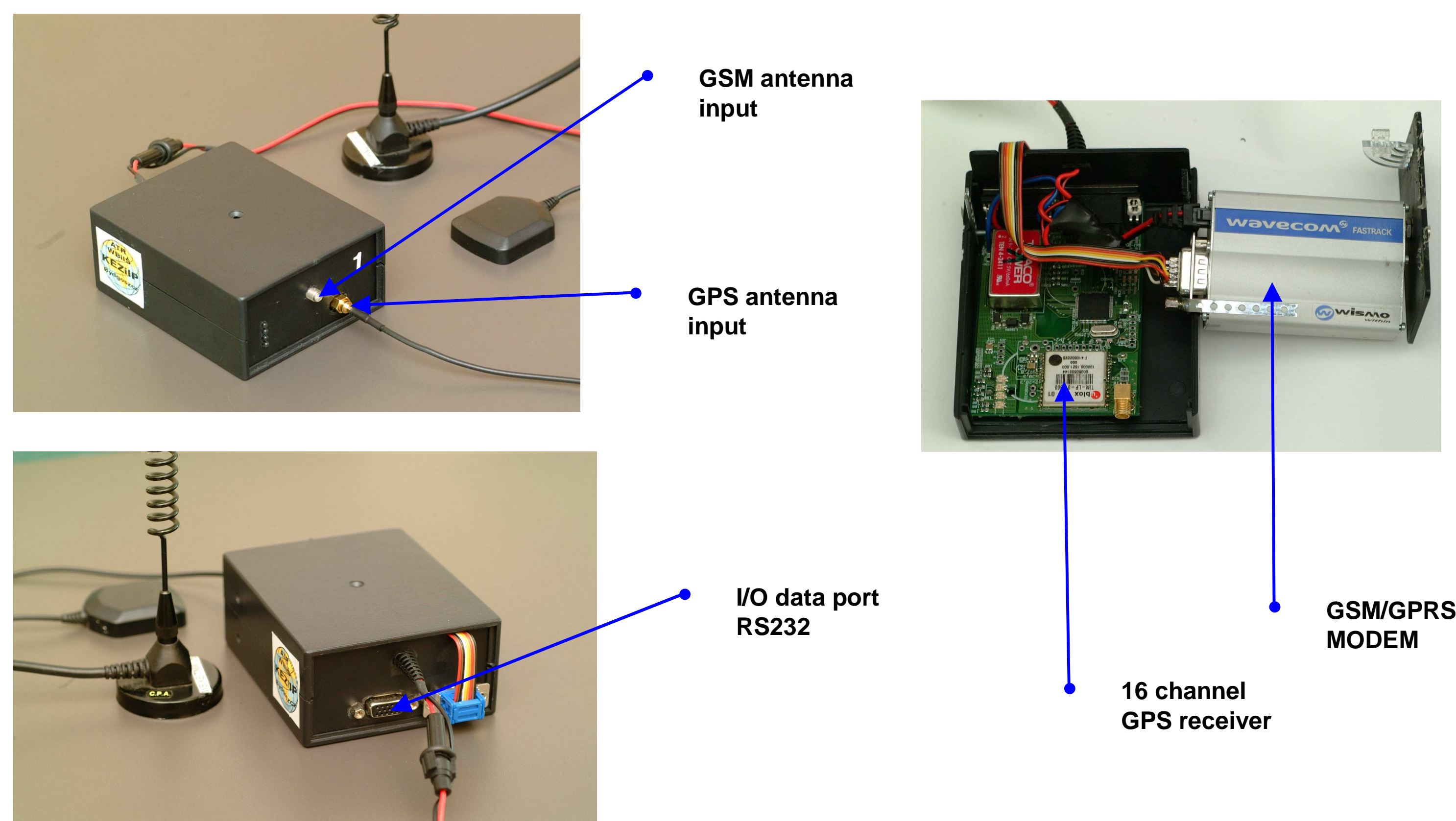
VEHICLE EQUIPMENT

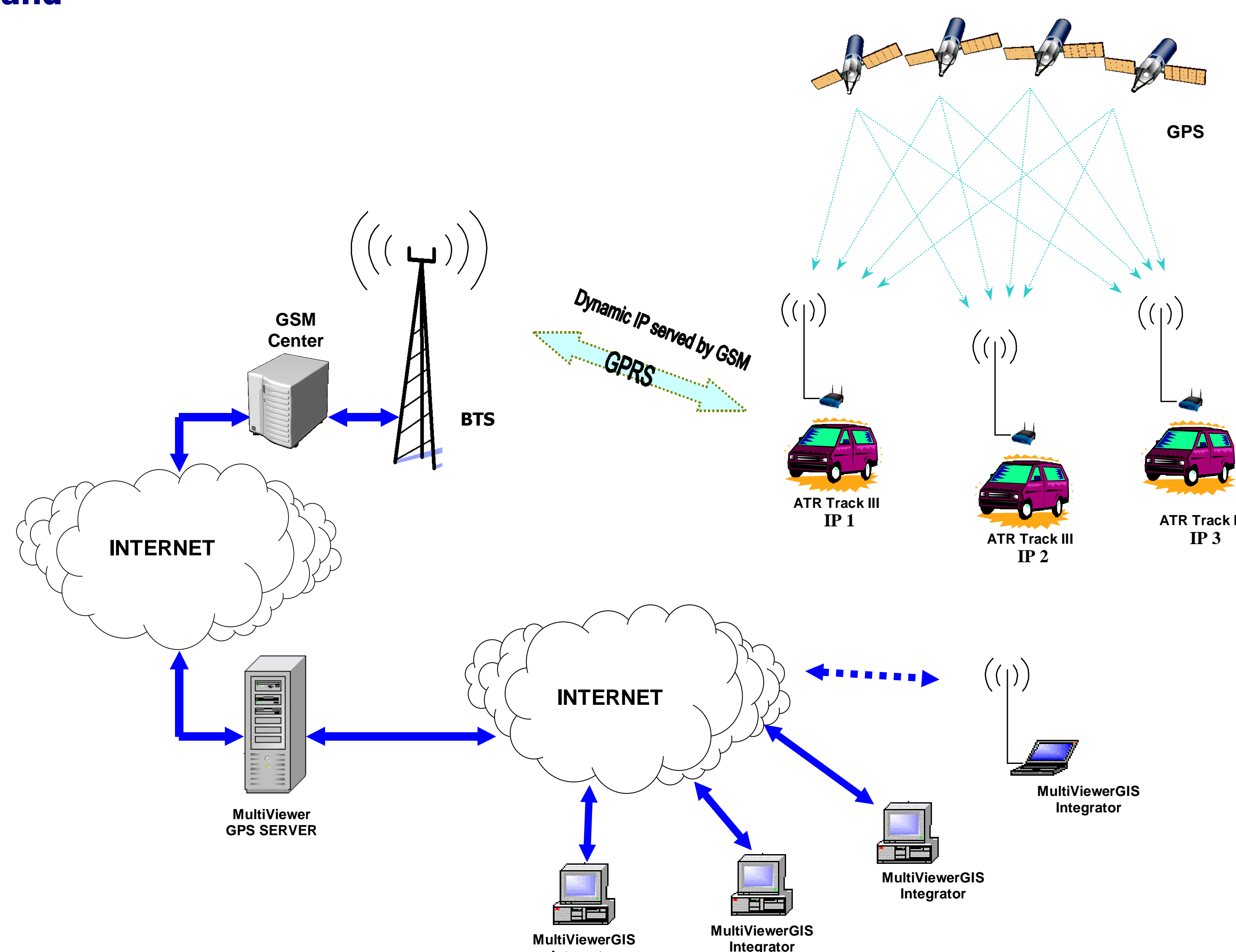Fig. 2. GPS / GPRS / I/O integrated unit of ATR Track III

Fig. 1. The ATR TRACK III system architecture

HOW DOES IT WORK?

ATR Track III is based on mobile stand-alone terminals, which combine GPS technology to determinate their own position. GSM wireless networks set a two-way communication between the mobile unit and control center. ATR Track III devices use GSM/GPRS modem to connect with internet, then this medium allows to send position data and get messages from remote server.

After connecting to internet, ATR track III devices retrieve MultiViewer GPS Server basing on defined IP number and try to log in. If IP of device is coincident to the list numbers define on server then it is accepted to service. The MultiViewer GPS Server start up to collect position data and make them available to outside clients. Every user equipped with MultiViewer GIS Integrator console can connect to server by internet and to receive position data from the whole fleet.
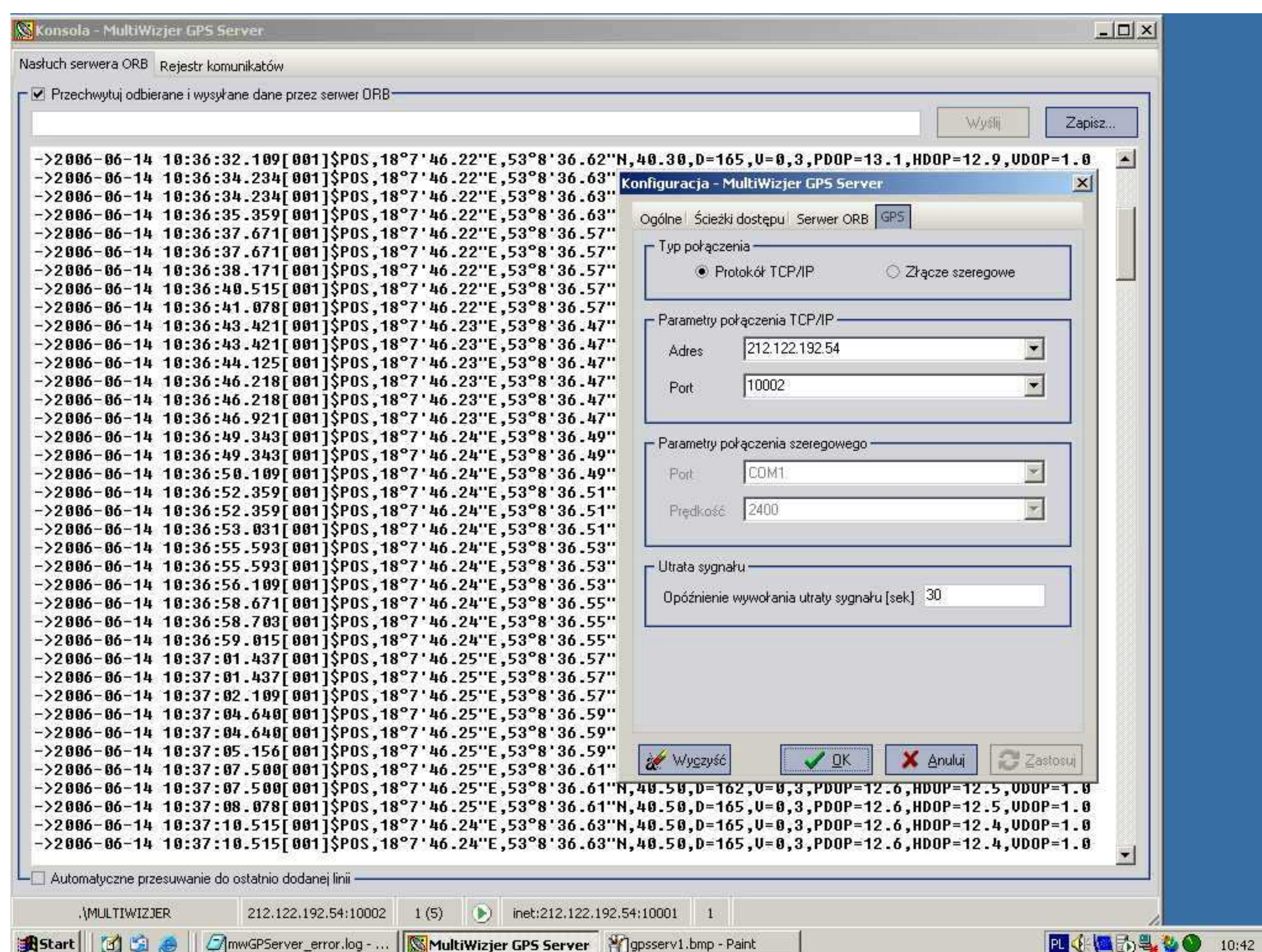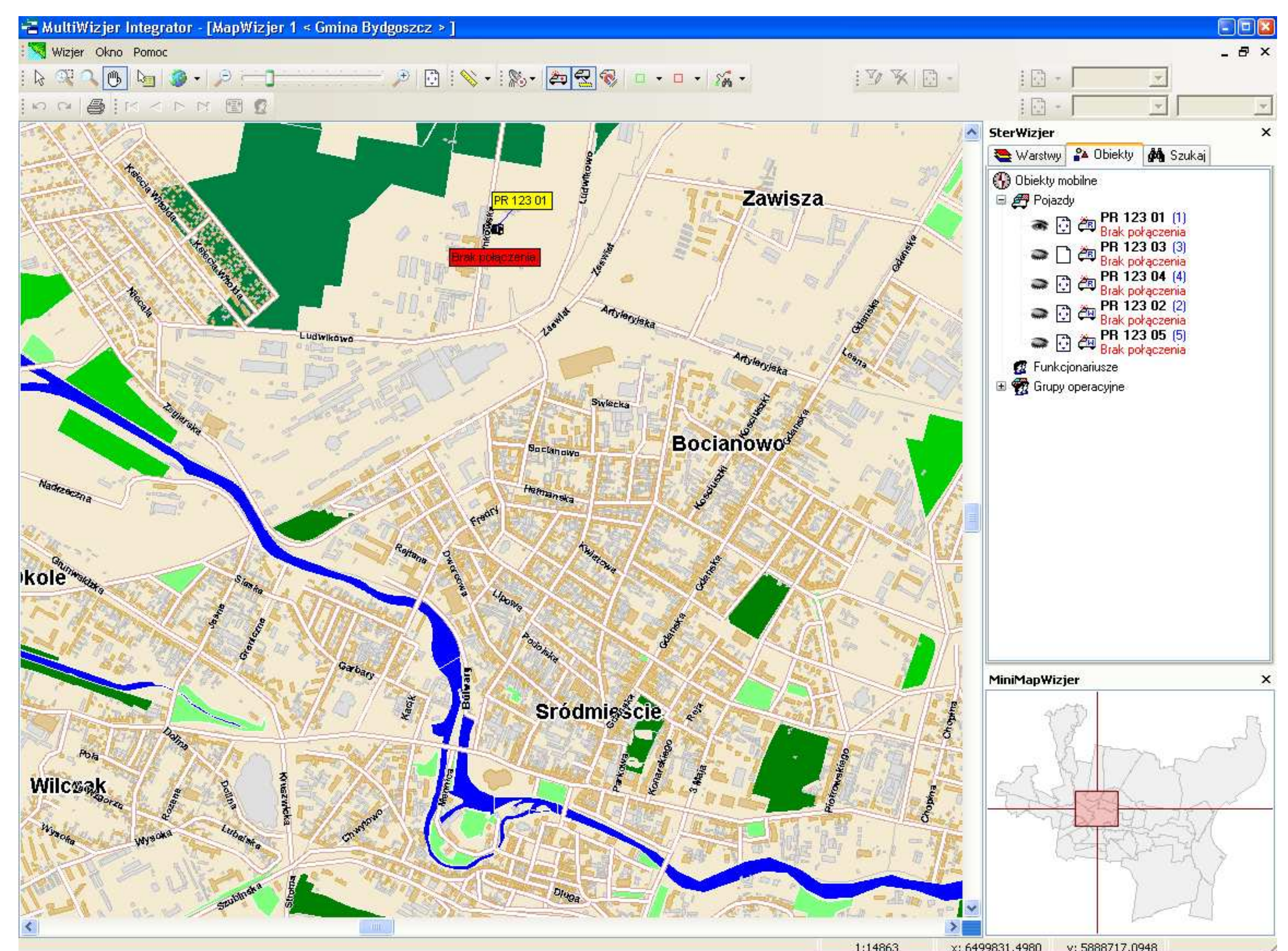

Fig. 3. MultiViewer GPS Server console

Fig. 4. MultiViewer GIS Integrator console

TEST ROUTE DESCRIPTION

Field tests of the ATR Track III system were conducted in the city of Bydgoszcz.
A 25 km traverse going in one of the city district was selected. This particular stretch of the city has significant changes in buildings and curvature, making it a suitable traverse for testing the system. In figures 5 and 6 the comparison of ATR Track III , Magellan ProMARK X-CM GPS/DGPS positions versus digital map coordinates is presented.
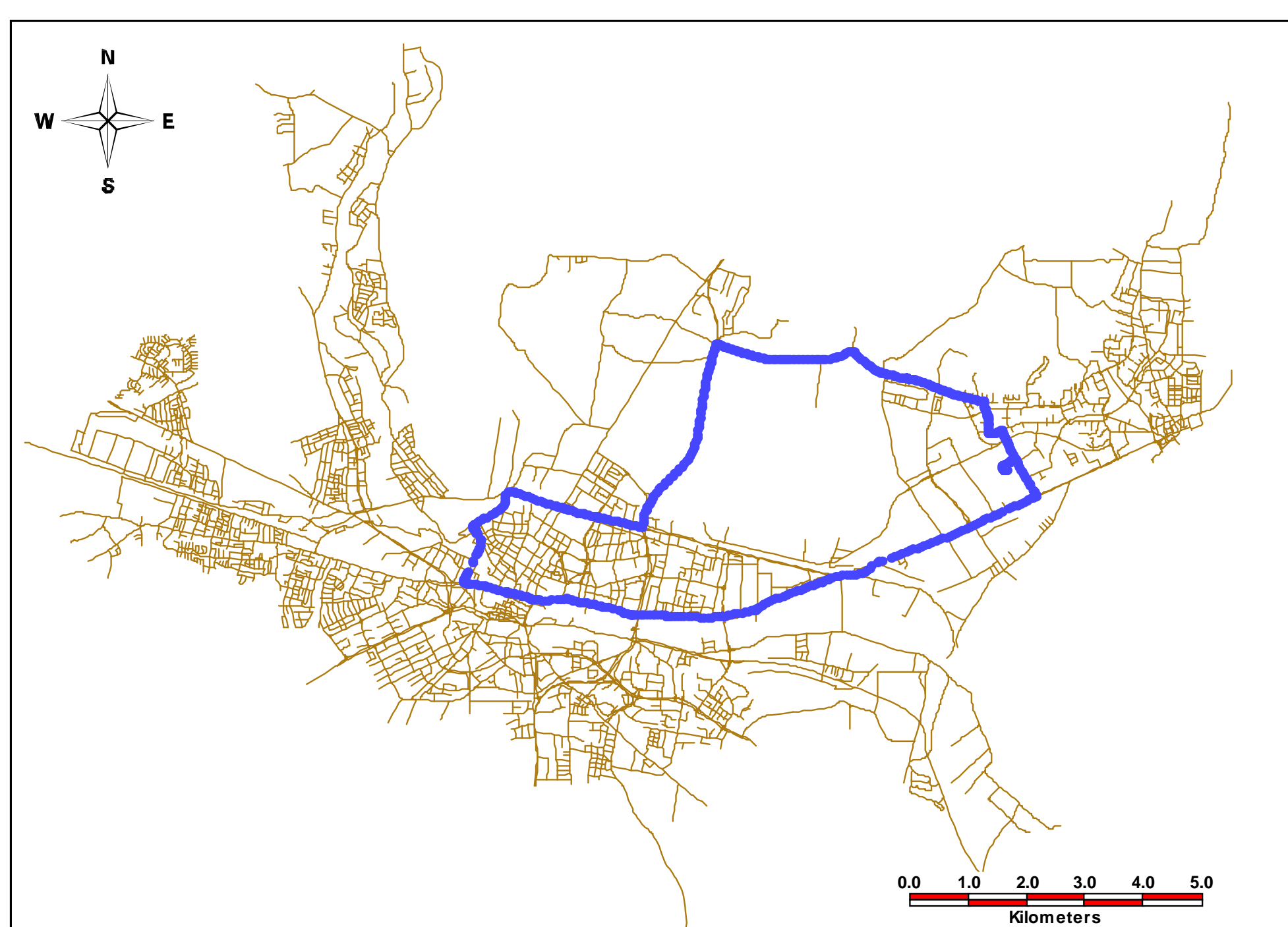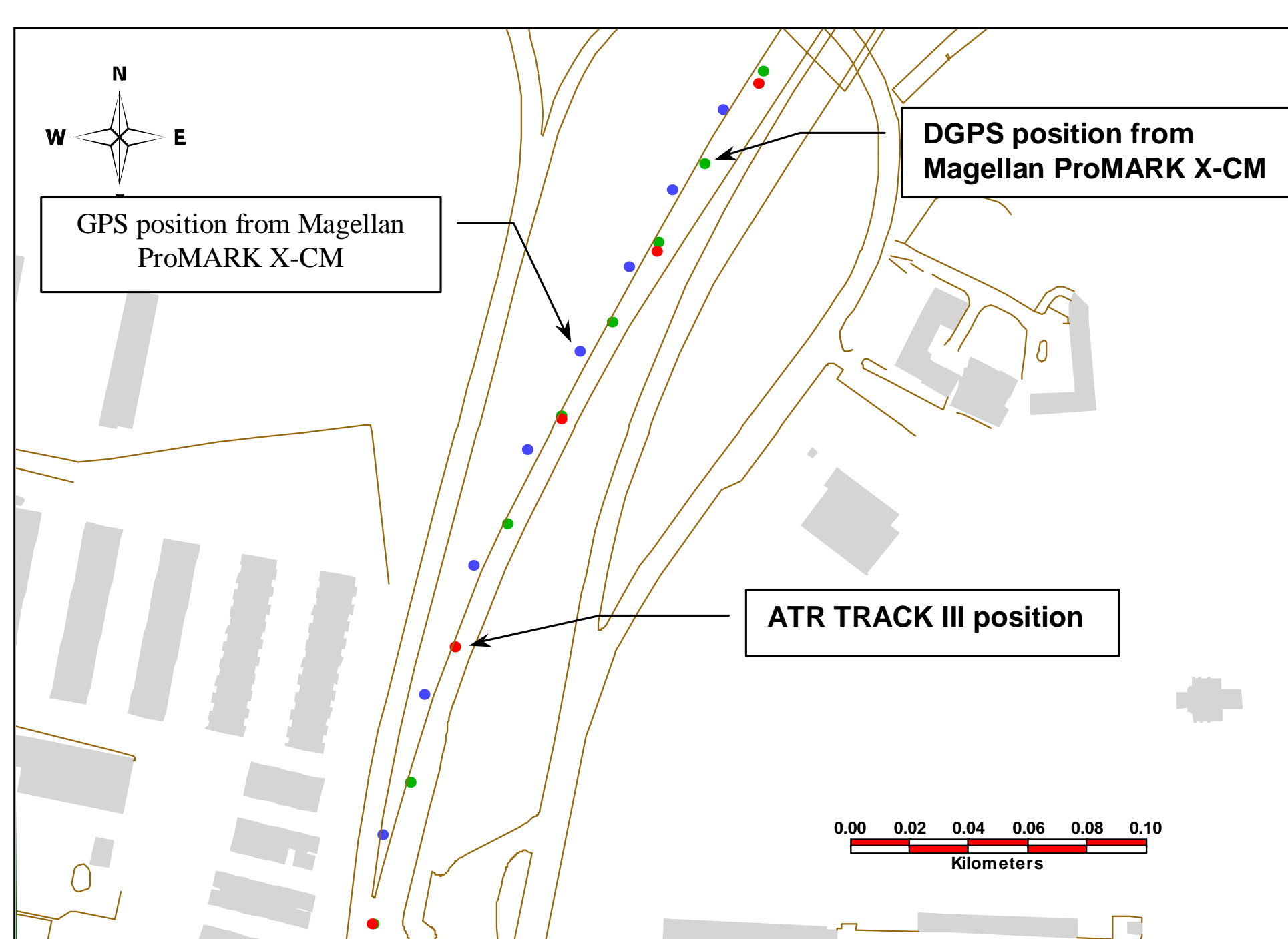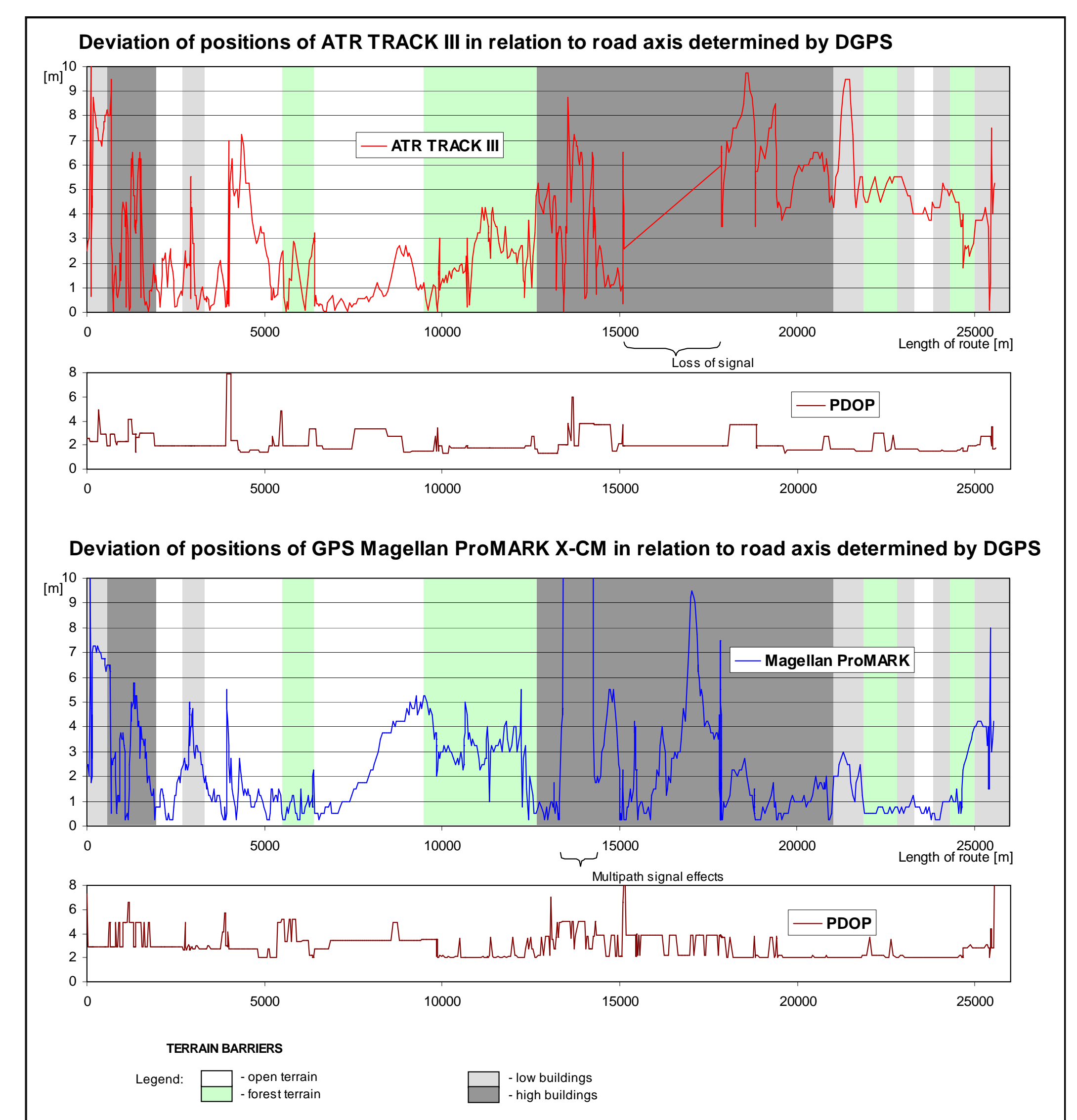

Fig. 5. The whole test route

Fig. 6. The positions of ATR Track III, Magellan ProMARK X-CM (route fragment)

Deviation of positions of ATR TRACK III in relation to road axis determined by DGPS

Deviation of positions of GPS Magellan ProMARK X-CM in relation to road axis determined by DGPS

Adventages of ATR Track III:
- no limitation of monitored vehicles,
- no limitation in possibilities data access
- minimalization of cost service and installation