

FIG

FIG WORKING WEEK 2017

Helsinki Finland

29 May - 2 June 2017

*Presented at the FIG Working Week 2017,
May 29 - June 2, 2017 in Helsinki, Finland*



Surveying the world of tomorrow -
From digitalisation to augmented reality

Organised by



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From digitalisation to augmented reality

Fit-for-Purpose Land Administration in Practical Application

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GCI – Geo Consult International GmbH & Co. KG
Leipzig, Germany

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Trimble Land Administration, Germany



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Fit for Purpose

- **Flexible** ...in data capture methods
- **Inclusive** ...to cover all tenure and all land
- **Participatory** ...use and ensure community support
- **Affordable** ...to establish, to operate and to use
- **Reliable** ...information is authoritative and up-to-date
- **Attainable** ...within adequate time and budget
- **Upgradable** ...for incremental improvement

indication of source:

Fit-For-Purpose Land Administration, Joint FIG/World Bank Publication, Stig Enmark a. o., 2014



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Practical Applications

Georgia (2000-2008)

Azerbaijan (2013-2016)

Mongolia (2005-2012)

Ghana (2007-2010)

Honduras (2012-2015)

Cambodia (2010-2016)

Laos (2006-2017)



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Affordability

Establish a Geodetic Framework



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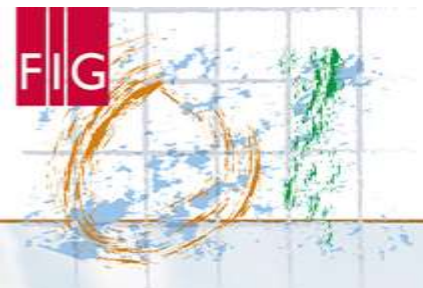


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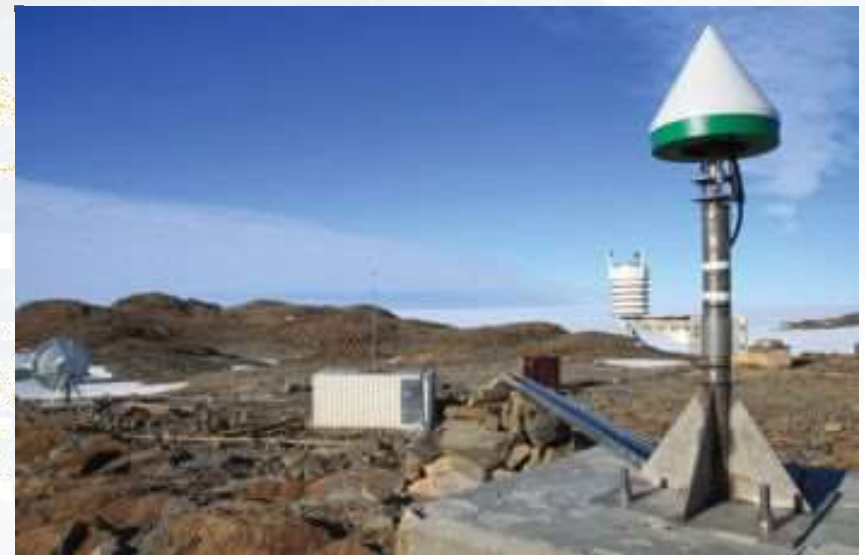
RTX Service

Centimetre everywhere.



CORS

Centimetre in seconds.



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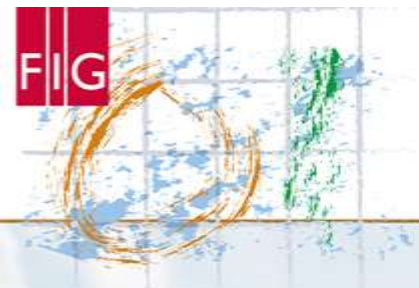


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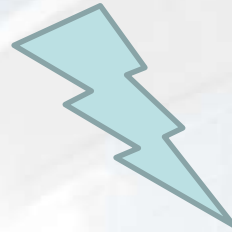
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From digitalisation to augmented reality

Trimble RTX + RTK



R10 with RTX-function
(as base station)



R10 as GNSS-rover



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From digitalisation to augmented reality

Trimble RTX + RTK

- Start immediately
- Flexible
- Low start investment
- Build CORS network in parallel while surveying parcels
- Cover all areas
- Fast initialization also in difficult environment



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Reliability

Aerial Imagery vs. Field Work



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Definition of Parcel Boundaries – Rural Area



Orthophoto with fields



Fields with boundaries



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Definition of Parcel Boundaries – Urban Area



Orthophoto with village



Village with boundaries



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Decision on site



Penmap Software

- Tablet, PDA, Phone
- Satellite imagery
- Background maps
- GNSS
- Total Station
- Tape, Laser



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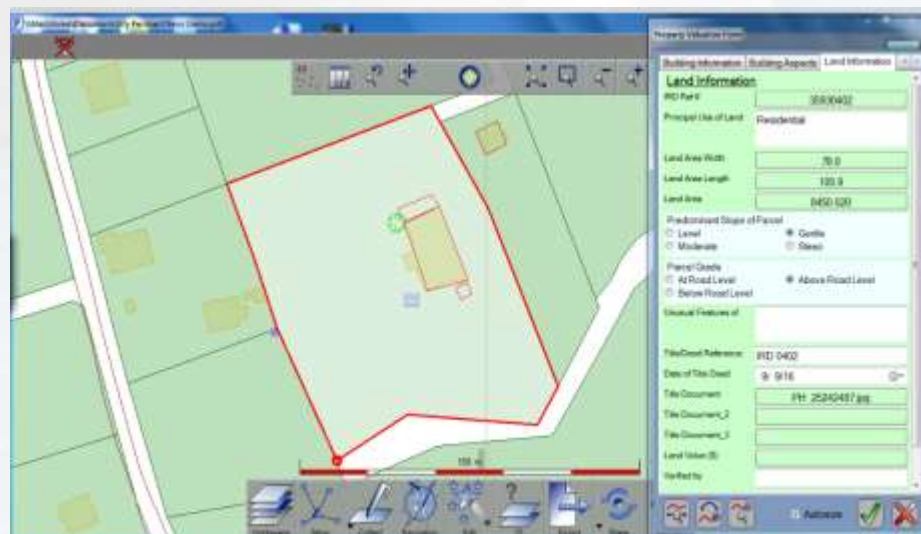
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Penmap

- Combine available data on-site
- Record quality information
- Surveying raw data
- Keep history
- Add data for Valuation
- Capture tenure information



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Reliable information

- Decision on site / Penmap
- Imagery in the field as support
- Agreement with property owners / land users
- Customary right / individual rights
- STDM
- Link objects with documents



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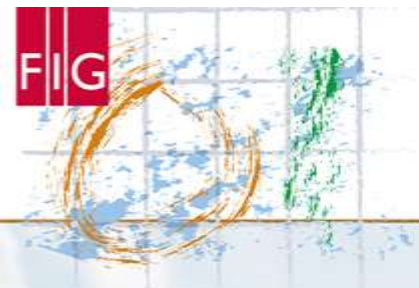


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overall costs 7 - 17 US\$ per parcel



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Conclusions / What we've learnt

- Start immediately with low initial investment
- Involve individuals (owners / users)
- Accompany project implementation with capacity building
- Combine technologies
- Collect information and take decisions on site
- Partnership between state agencies and private sector

More in the full paper.



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