



UAV data in a training centre for rescue and emergency forces: The EU's TT-GSAT project

Irmgard Runkel,
GEOSYSTEMS GmbH

TT-GSAT - Test- and Training-Centre for Geoinformation- and Satellite based Rescue & Emergency Services (TT-GSAT)

Home » Portfolio » TT-GSAT



ACTIVITY	Demonstration Project (from FS)
STATUS	Ongoing
THEMATIC AREA	Aviation, Safety & Security, Education & Training

- support an end-user-oriented development making good use of **new security technologies products and services**;
- **speed up** the time-to-operation, reduce risk of implementation and enable capacity building
- foster the utilization of **innovative technologies**, products and services in this particular market segment.



TT-GSAT - Test- and Training-Centre for Geoinformation- and Satellite based Rescue & Emergency Services (TT-GSAT)

ARTES 20: Integrated Applications Promotion (IAP) Programme • Feasibility Studies / Demonstration Projects • AO/1-6124/09/NL/US (Issue 5.3), ESA/IPC(2009)11, 09.153.75

Home » Portfolio » TT-GSAT



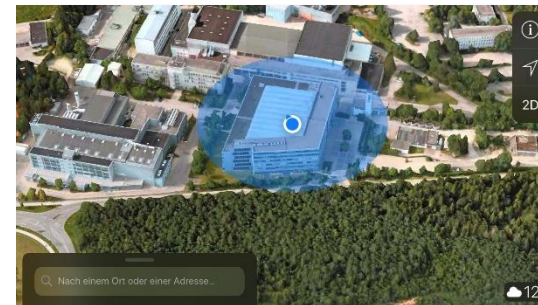
ACTIVITY	Demonstration Project (from FS)
STATUS	Ongoing
THEMATIC AREA	Aviation, Safety & Security, Education & Training



Multimedia Emergency Services Communication



Ad-hoc Image processing



Secure localization & navigation



Situation display and mission control



„digital.sicher.vernetzt.“

<https://www.iabg.de/>

- Independent technical consulting
- **Terrestrial radio systems (including TETRA, ad-hoc networks)**
- Control centers
- Operation of test facilities
- Global Navigation Satellite Systems GNSS (especially Galileo Public Regulated Service PRS)
- Satellite communications
- Geographic Information Systems GIS
- Earth Observation
- Safety & Security



„Wir realisieren Innovationen für mobile Menschen und Güter“

<http://www.protime.de/>

- Mobile data communication
- **Satellite navigation and positioning**
- **Mobile networked electronic devices**
- Telematics services
- System analysis and development
- Mobility and logistics
- Protection and security
- Tourism and seniors
- Security applications
- TT-GSAT Feasibility study member

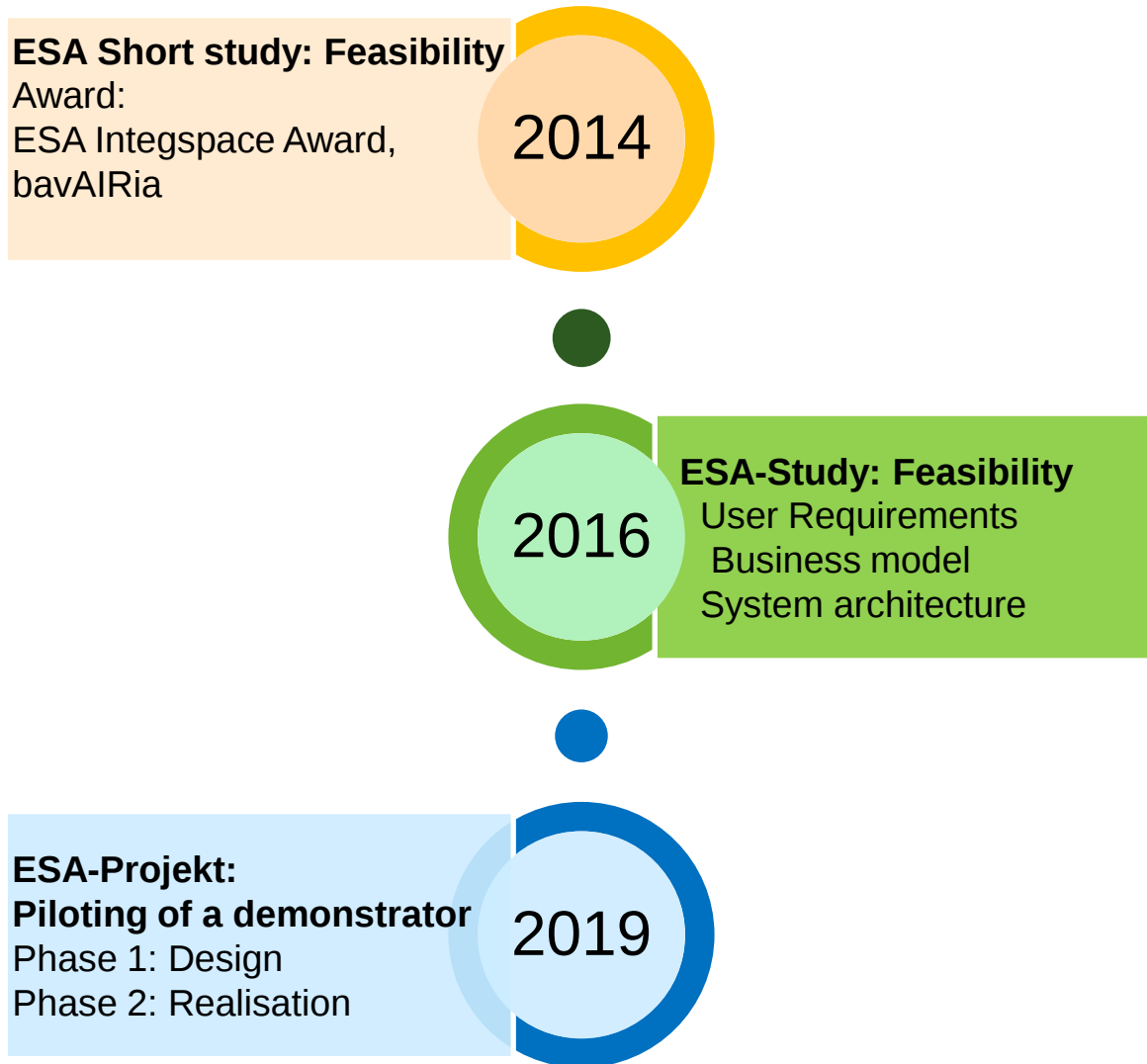


„Die Experten für raumbezogene Daten“

<https://www.geosystems.de/>

- **Automated processing chains**
- Remote sensing
- Photogrammetry
- **Software and service provider** for analysis, processing, distribution and management of high-resolution satellite, aerial and drone imagery
- Geographic Information Systems GIS
- **Spatial data management**
- Hexagon Geospatial Partner
- long-standing partner of IABG

From the idea to the demonstrator and further



Involved BOS users (selected):

- Bavarian Police (PP, BLKA, Training Institute)
- Munich Fire Department
- State Fire Brigade School Geretsried
- Technical Relief Organization (THW, Munich)
- Federal Criminal Police Office (BKA)

Involved industry partners (selected):

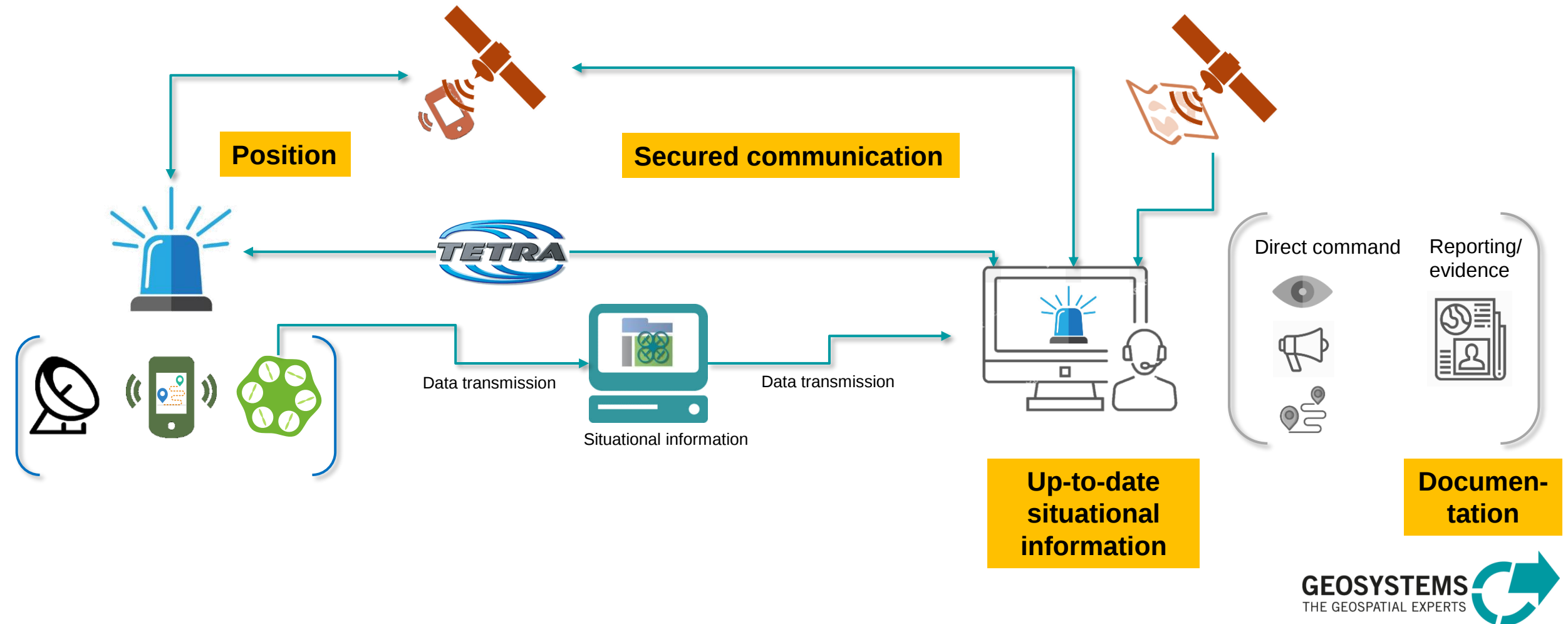
- Avaya
- Hexagon
- Microdrones
- Eurofunk Kappacher

Results

- Over 200 user requirements -> approx. 30 prioritized requirements
- Provision of proof of feasibility, profitability analysis
- Draft services, subject areas, possible system architecture, organizational approach

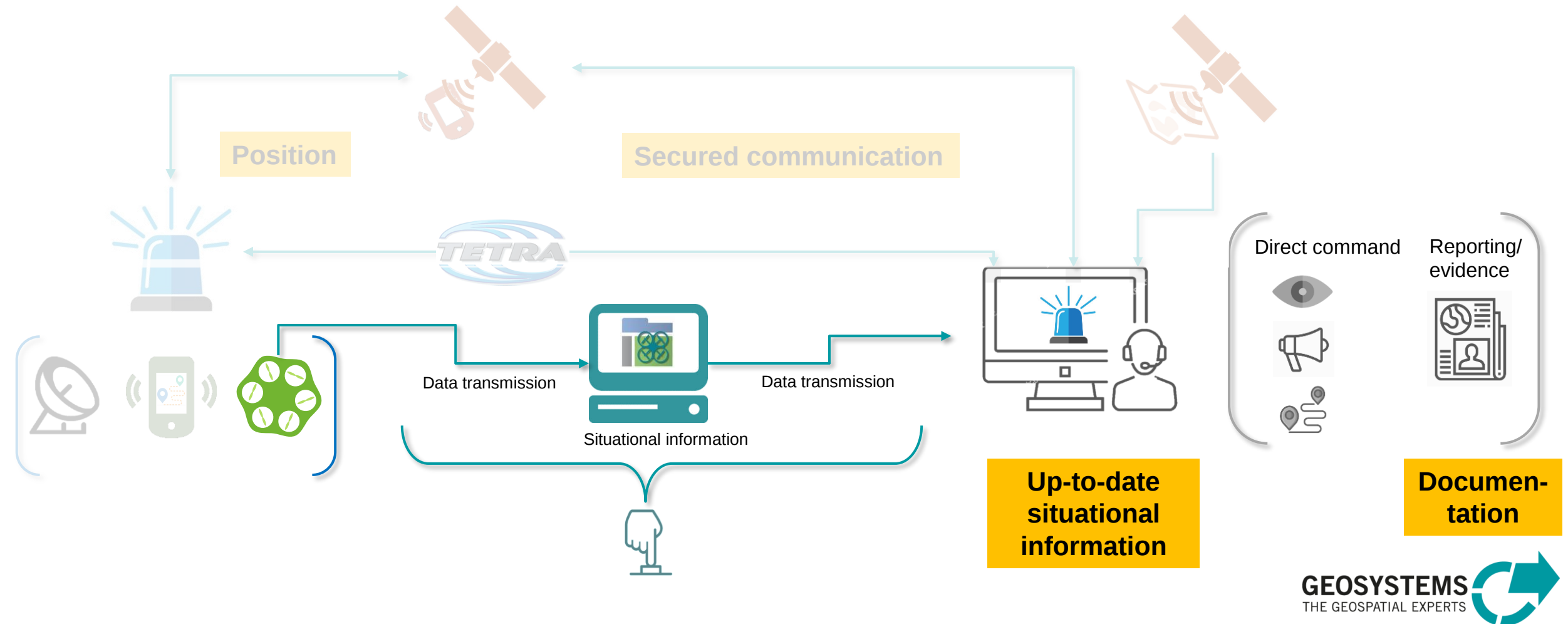
Overall capability of necessary operational components

- Seamless information transfer counts



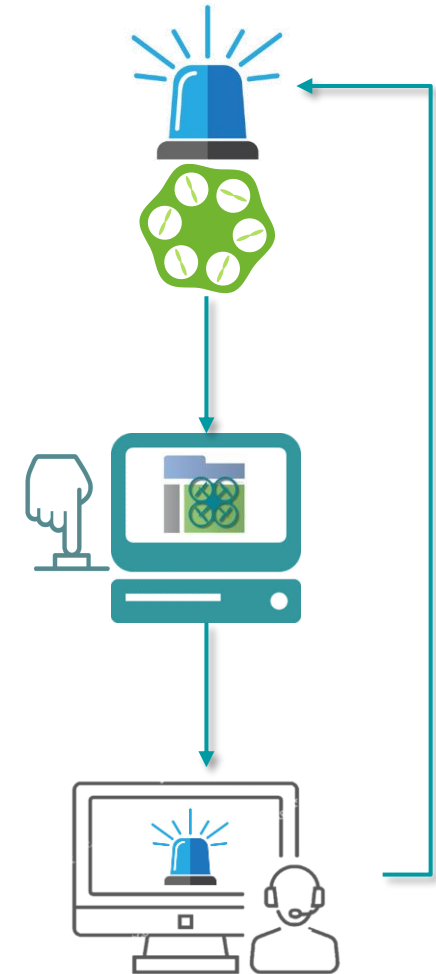
Overall capability of necessary operational components

- Seamless information transfer counts



The drone - a link in the chain of operations

- Latest situation report
 - Search for missing persons and persons
 - Situation reconnaissance for mission optimization
 - Accident documentation
 - Surveillance at large events
- Interaction with mission communication
 - Data/position from and to the actor (cell phone, GPS, dashboard, etc.)
- Data transmission directly to the operations control center



Requirements for drones in the BOS environment

Fire brigade

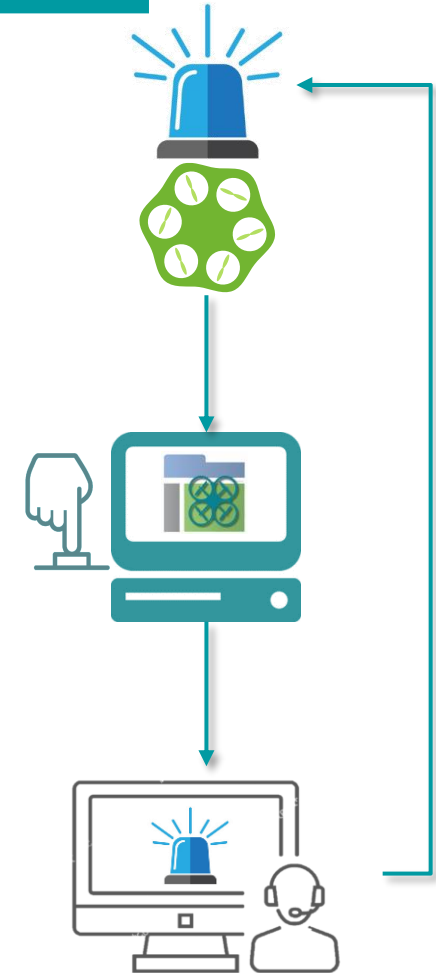
Police

THW

Mountain rescue

Disaster

- Special cameras → Thermal imaging camera, multispectral cameras
- Easy transport and setup
- Easy operation (must be secondary)
- More payload (f. special equipment)
- Automatic data preparation (depending on requirements)
- Automatic data availability at the decision maker (incident commander, operations control center)
- Administrative exempt operation (LuftVO §21a (2))
→ direct operation Liability insurance
- Ongoing training on state-of-the-art technology and operation



Fire department and drone

- Where are pockets of fire or embers?
- Where do potential dangers lurk?
- How can firefighters be guided safely to and from the fire or fire scene?



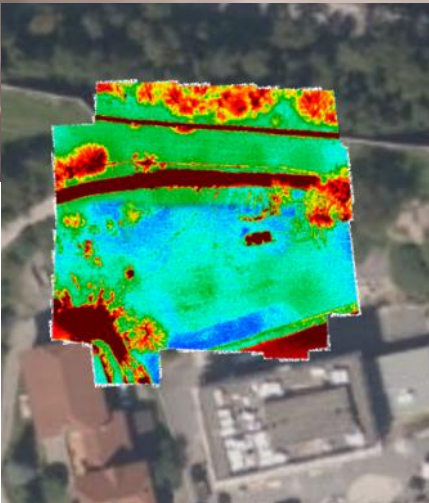
„In the future, drones will be an indispensable tool for fire departments, in their daily operations as well as in disaster management.“

Hartmut Ziebs, President of the DFV.





Pockets identification



Thermal information with
aerial information

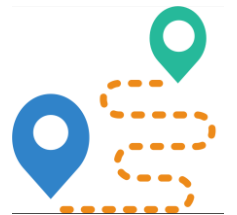


- Direct situational information
 - Visual identification
 - Automatically reported listing
 - Mobile app for localization (Smart-Phone)
- Faster and more reliable



Situation

- Visual
- Pocket coordinates
- Waypoints



THW and drone

- Operation in the explosive ordnance contaminated area of Lübtheen (THW Freising with thermal imaging cameras)
- Operationally in action: Unit UL - unmanned aerial reconnaissance
 - different drones,
 - Base vehicle f. mission tactical evaluation,
 - 18 drone pilots



Information from satellite image data - here Sentinel S2



Police and drone

- Resources
 - Closes capability gap
 - Reconnaissance and documentation
 - Cost effective
 - Permanent evolution
-
- Permanent need for :
 - Exercise
 - Know-how
 - Knowledge



The poster is for an event titled "POLIZEIDROHNEN IM EINSATZ" (Police Drones in Use). It features logos for "AERO FRIEDRICHSHAFEN", "UAS EXPO AERO DRONES", and the "POLIZEI BADEN-WÜRTTEMBERG" (Baden-Württemberg Police). The event dates are "10. + 11. APRIL 2019" at "MESSE FRIEDRICHSHAFEN". The poster includes German text describing the importance of drones in police work and the event's focus on theory, practice, and networking. It also provides a website for more information and registration: www.aerodrones.info/polizei.

AERO FRIEDRICHSHAFEN **UAS EXPO AERO DRONES** In Kooperation mit der Polizei Baden-Württemberg **10. + 11. APRIL 2019** MESSE FRIEDRICHSHAFEN

POLIZEI BADEN-WÜRTTEMBERG

POLIZEIDROHNEN IM EINSATZ

Theorie | Praxis | Networking

Drohnen sind in der Polizeiarbeit ein wertvolles Einsatzmittel. Sie füllen die Fähigkeitslücke zwischen dem Hubschrauber und der bodengebundenen Aufklärung und Dokumentation perfekt und kostengünstig.

Diese enorme Vielfalt in der Anwendung variiert erheblich – von Bundesland zu Bundesland, jedoch erst recht über Ländergrenzen hinweg. Ebenso durchläuft die unbemannte Technik eine permanente Evolution.

Innerhalb kürzester Zeit haben sich vielfältige Anwendungsmöglichkeiten entwickelt – von der Tatortdokumentation bis hin zu Einsätzen bei verdeckten Ermittlungen.

Die AERO-Sonderveranstaltung „Polizeidrohnen im Einsatz“ bringt Einsatzwissen, Erfahrungsaustausch und reale Flugszenarien europaweit an einem Ort zusammen: in Friedrichshafen.

MEHR INFORMATIONEN UND ANMELDUNG
www.aerodrones.info/polizei

Mountain rescue and drone

- Closes the gap between walking and helicopter
- Situation:
 - test phases,
 - partial operational deployment,
 - decentralized considerations and acquisitions
 - individual equipment
 - training usually by manufacturer => functional training



Unmanned helicopter – about 1 Mio EURO



Seminar „Drohneneinsatz und IT- Sicherheit“ an der SFSG



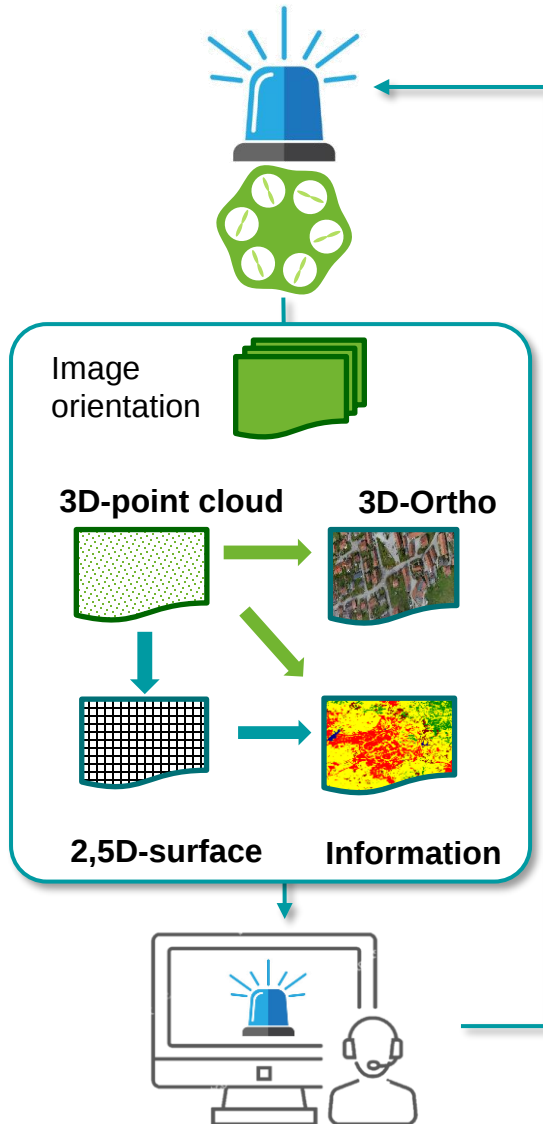
Drone with FLIR – Bavarian Mountain Rescue

For a meaningful situational awareness



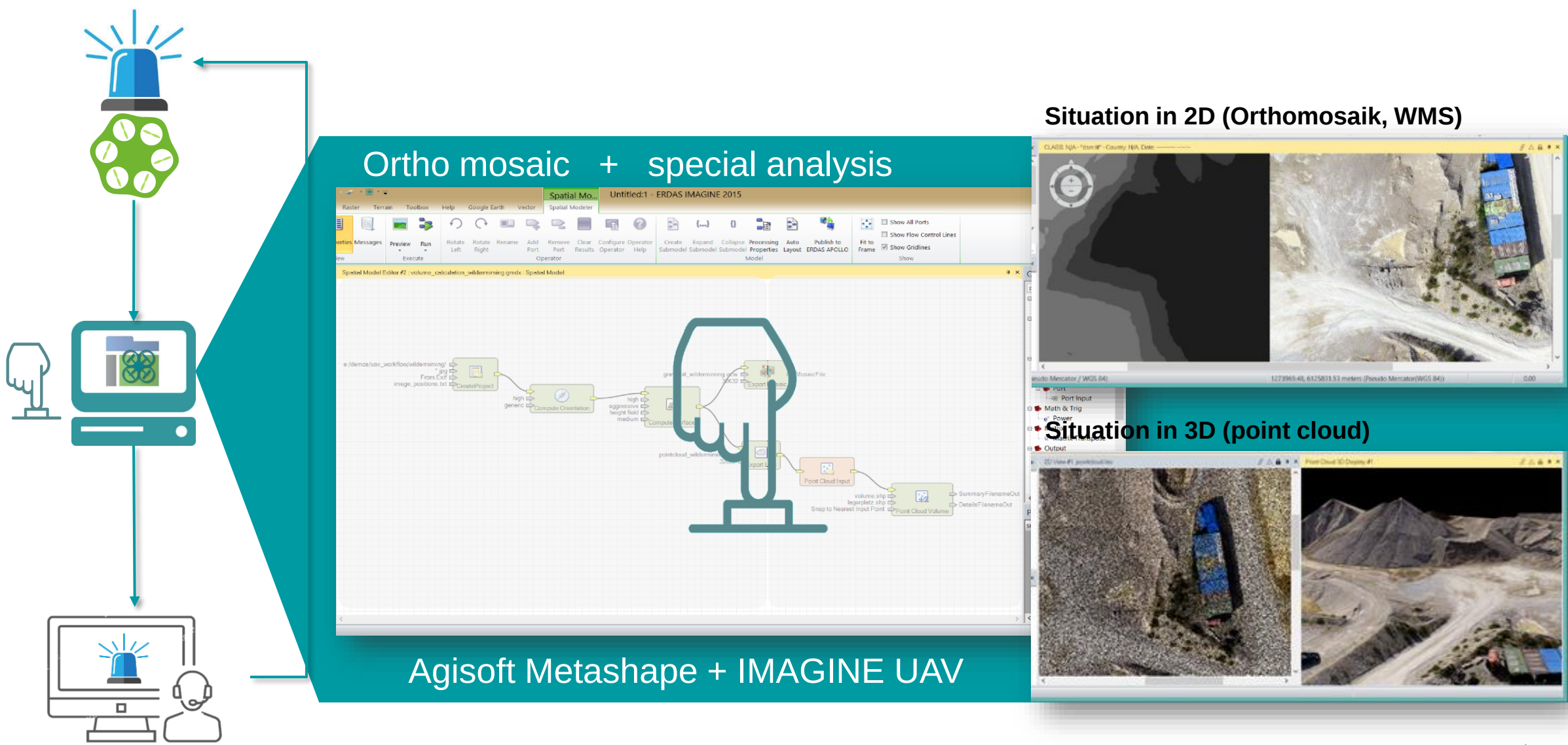
- Sensor-independent processes
 - Fully automated process chain in the background
 - Data processing where it makes sense (desktop / cloud)
 - Direct data integration into the operations control center
 - Reportable data
 - Universal workflow, easy to adapt to special requirements
 - Quality assured algorithms
 - No special knowledge required for operation
 - (interchangeable procedures)
-
- Creation of a 2D position image (position: x,y)
 - Creation of a 3D position image (position and height: x,y,z)

For a meaningful situational awareness



- Photogrammetry
=> precise position information x,y,z
- image data processing
=> basic data
- algorithms for special topics
=> e.g. identify embers
- Data service for operations control center
=> mission-compliant data formats

For a meaningful situational awareness





Example: Vorarlberg State Warning Center

- Fire department + drone + evaluation in the emergency vehicle + data upload to the operations control center
- Delay-free, fully automatic creation of current situation image data



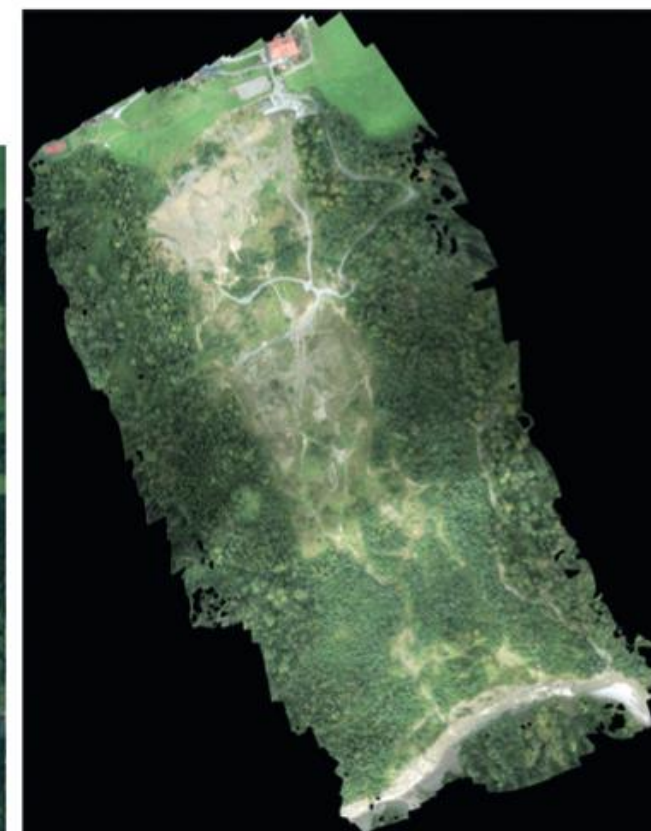
Bild: Landeswarnzentrale Vorarlberg

Event: Landslide Doren



Bild: Landeswarnzentrale Vorarlberg

Flightplan drone



Up-to-date ortho mosaic



Example: Vorarlberg State Warning Center

- Fire department + drone + evaluation in the emergency vehicle + data upload to the operations control center
- Delay-free, fully automatic creation of current situation image data



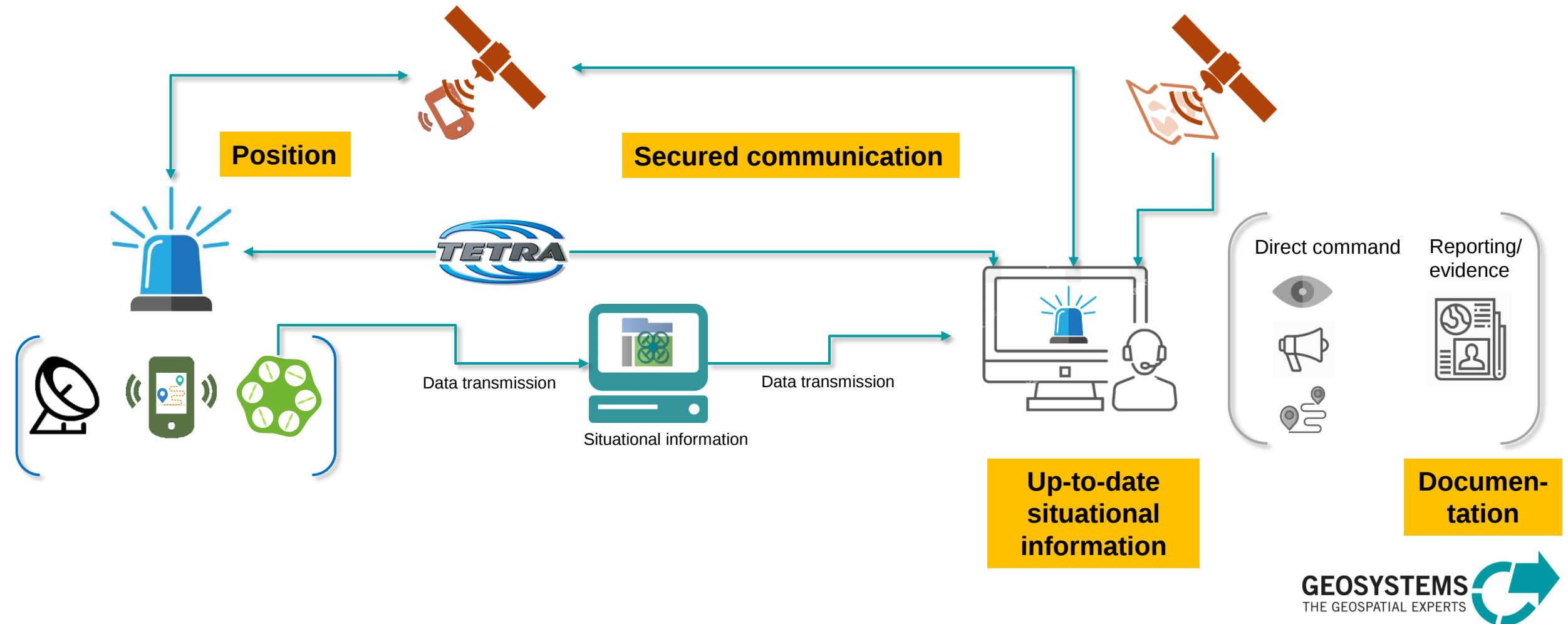
Bild: Landeswarnzentrale Vorarlberg



Bild: Landeswarnzentrale Vorarlberg

Overall capability of necessary operational components

- Seamless information transfer counts





Test and training center for geo-information and satellite-based rescue & emergency services

Secured communication



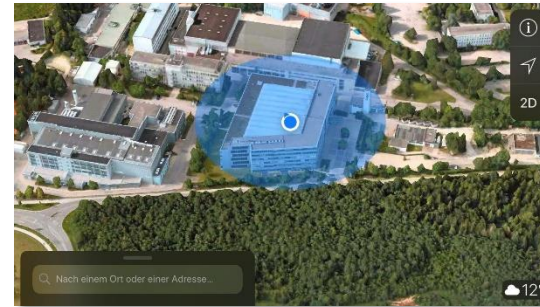
Multimedia Emergency Services Communication

Up-to-date situation



Ad-hoc Image processing

position



Secure localization & navigation

Decision, documentation



Situation display and mission control



Thank you!

Irmgard Runkel

GEOSYSTEMS GmbH

www.geosystems.de



https://youtu.be/K_5qHTPVm-Y