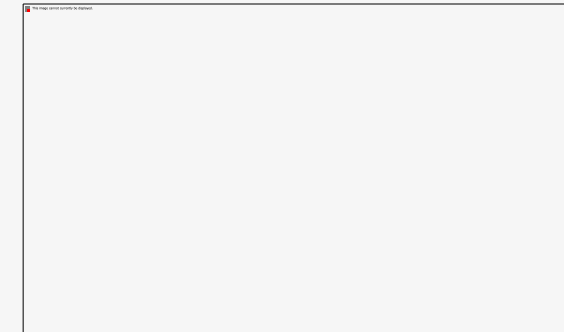


**FROM MAP TO APP FOR INTEGRATED LAND
INFORMATION SYSTEM
PRESENTED BY
VIVEK BANSAL, VICE PRESIDENT**



**ADDRESS.- 105, PHASE IV, UDYOG VIHAR SECTOR 18 GURUGRAM- 122015,
www.panindiagroup.com , paie@panindiagroup.com
Tel. No.: +91-124-2343880, Fax. No.: +91-124-2346646.**

Agenda

- About Pan India
- About SVAMITVA Scheme
- Pan India Solutions
 - Differential Global Positioning System (DGPS)
 - Drone
 - Post Processing Software
- Various Installation & Case Studies
- Conclusion



“About Pan India”

Inception

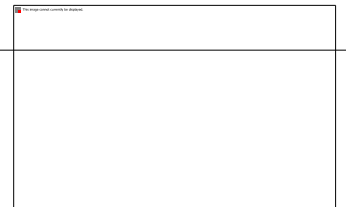
- ⑩ PAN India started its operation in year 1985
- ⑩ An ISO 9001:2015 Certified company
- ⑩ Member of Society of India Defence Manufactures (SIDM)

PIC Working Domain

- ⑩ Geospatial Technologies
- ⑩ Mining Solutions
- ⑩ Geophysical Solutions
- ⑩ Defence Technologies
- ⑩ Marine Construction Technologies
- ⑩ Hydrography and Oceanography
- ⑩ System Integrator
- ⑩ Customized Software Solutions

Make in India

- ⑩ Indigenously developed and delivered integrated solution for Hydrographic and Oceanographic Data Acquisition and Processing System (DAPS) Integrating multiple sensors such as Multibeam & Single beam Echosounders, DGPS, ROV and many more.



About “SVAMITVA” Scheme

- **SVAMITVA**, (*Survey of Villages Abadi and Mapping with Improvised Technology in Village Areas*) a Central Sector Scheme of Ministry of Panchayati Raj was nation-wide launched by the Hon’ble Prime Minister on National Panchayati Raj Day, 24th April 2021.
- A stepping-stone towards achieving Gram Swaraj in true sense and making rural India **Atmanirbhar**.
- A reformative step towards establishment of clear ownership of property in rural inhabited (Abadi) areas, by mapping of land parcels using drone technology and providing ‘Record of Rights’ to village household owners with issuance of legal ownership cards (Property cards/Title deeds) to the property owners.



Four Identified broad areas of Impact



Benefits of “SVAMITVA” Scheme

The scheme seeks to achieve the following objectives: -

- Creation of accurate land records for rural planning and reduce property related disputes.
- To bring financial stability to the citizens in rural India by enabling them to use their property as a financial asset for taking loans and other financial benefits.
- Determination of property tax, which would accrue to the GPs directly in States where it is devolved or else, add to the State exchequer.
- Creation of survey infrastructure and GIS maps that can be leveraged by any department for their use.
- To support in preparation of better-quality Gram Panchayat Development Plan (GPDP) by making use of GIS maps



Pan India Solutions

- Differential Global Positioning System (DGPS)
 - PARTH 1000 GNSS Receiver
 - SP85 GNSS Receiver
 - SP60 GNSS Receiver

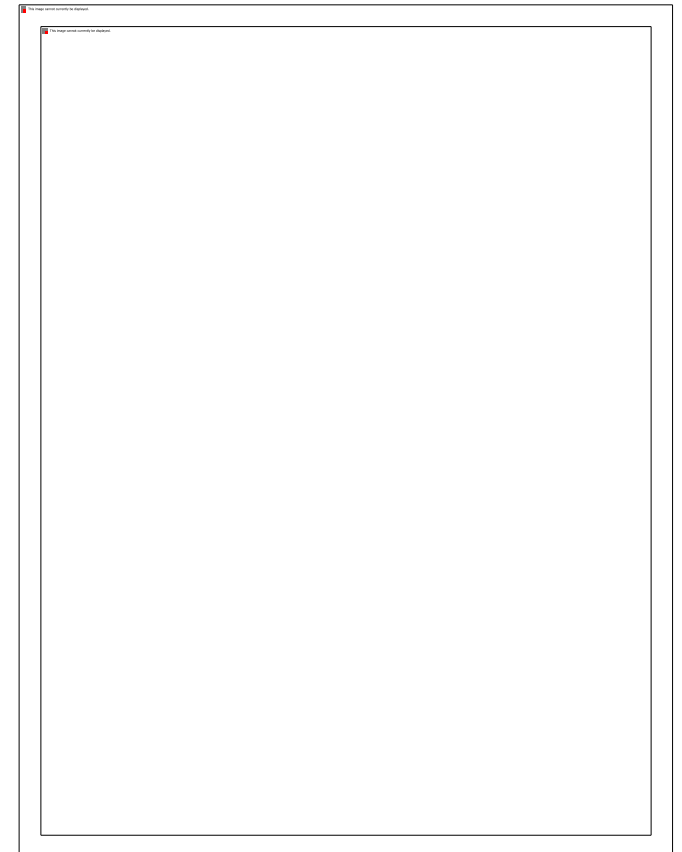
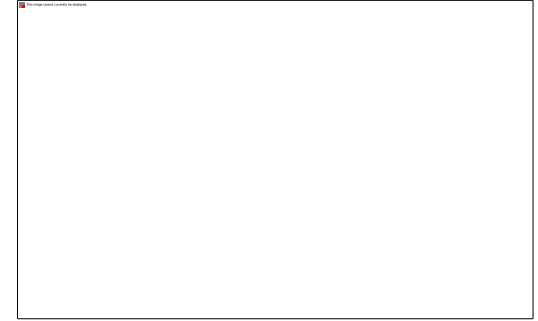
- Drone

- Post Processing Software



PARTH 1000 GNSS Receiver

- Indigenously developed under “Make in India”
- IRNSS enabled GNSS DGPS/RTK receiver
- GNSS receiver and radio with a choice of an external antenna.
- 336 Tracking Channels for multi-constellation GNSS
- Compact design for mobile applications
- Flexible RS232, USB and Ethernet, Wi-fi, Bluetooth interfacing
- High precision multiple correlators for GNSS pseudo range measurements
- Advanced RF Spectrum Monitoring and Analysis
- Rugged IP67 enclosure
- Applications in rescue missions, land surveying, rail networks, mining, agriculture, and environmental monitoring etc.
- Certified MIL Grade JS-55555 standards



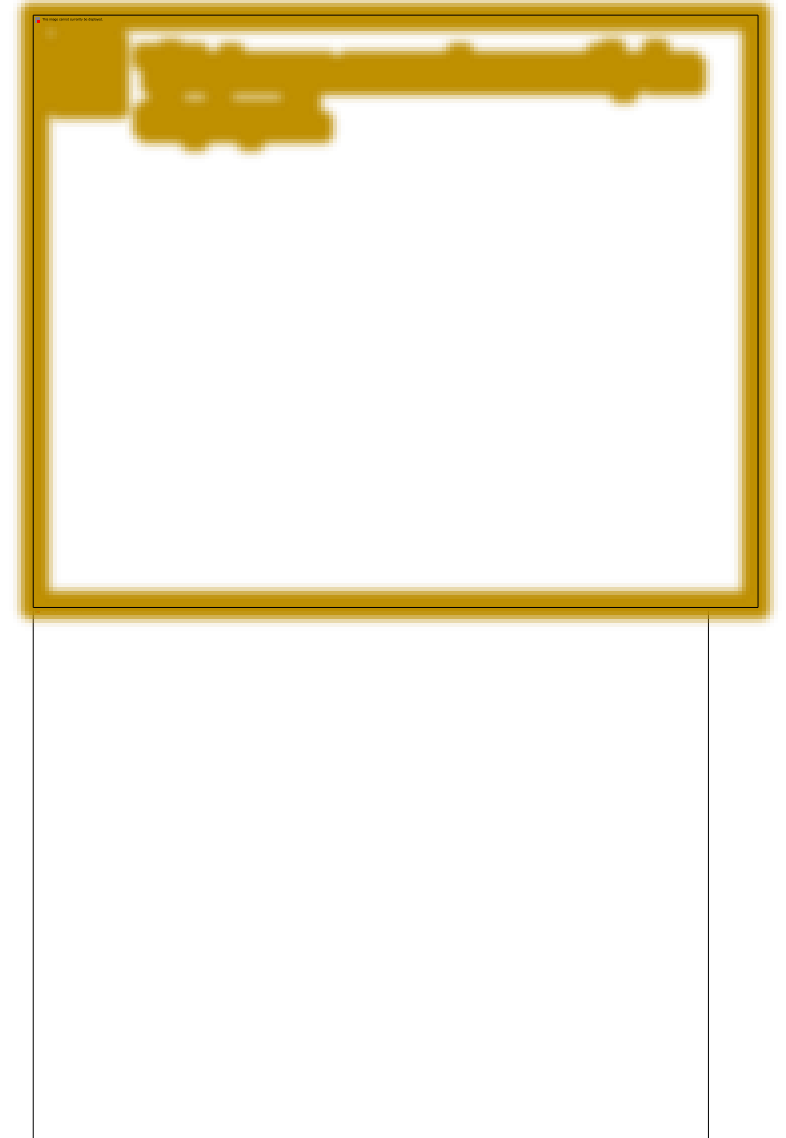
PARTH 1000 GNSS Receiver

Trials of PARTH 1000 successfully conducted for Indian Army

SP85 GNSS Receiver

Key Features:

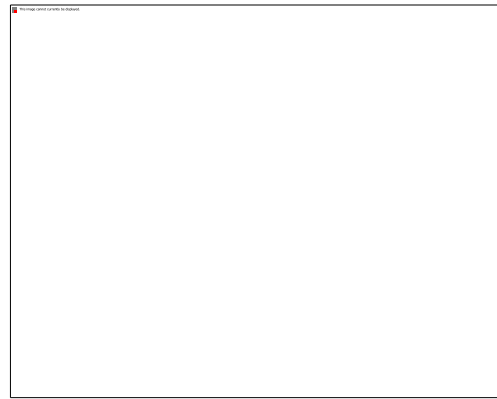
- Patented Z-Blade™ technology
- 600-channel "7G"
- Hot-swappable batteries
- Internal TxRx UHF radio
- L-band satellite capable GNSS antenna
- 3.5G cellular modem
- Built-in WiFi communication
- SMS and e-mail alerts
- Anti-theft technology
- Backup RTK
- RTK bridge
- eLevel technology



SP60 GNSS Receiver

Key Features:

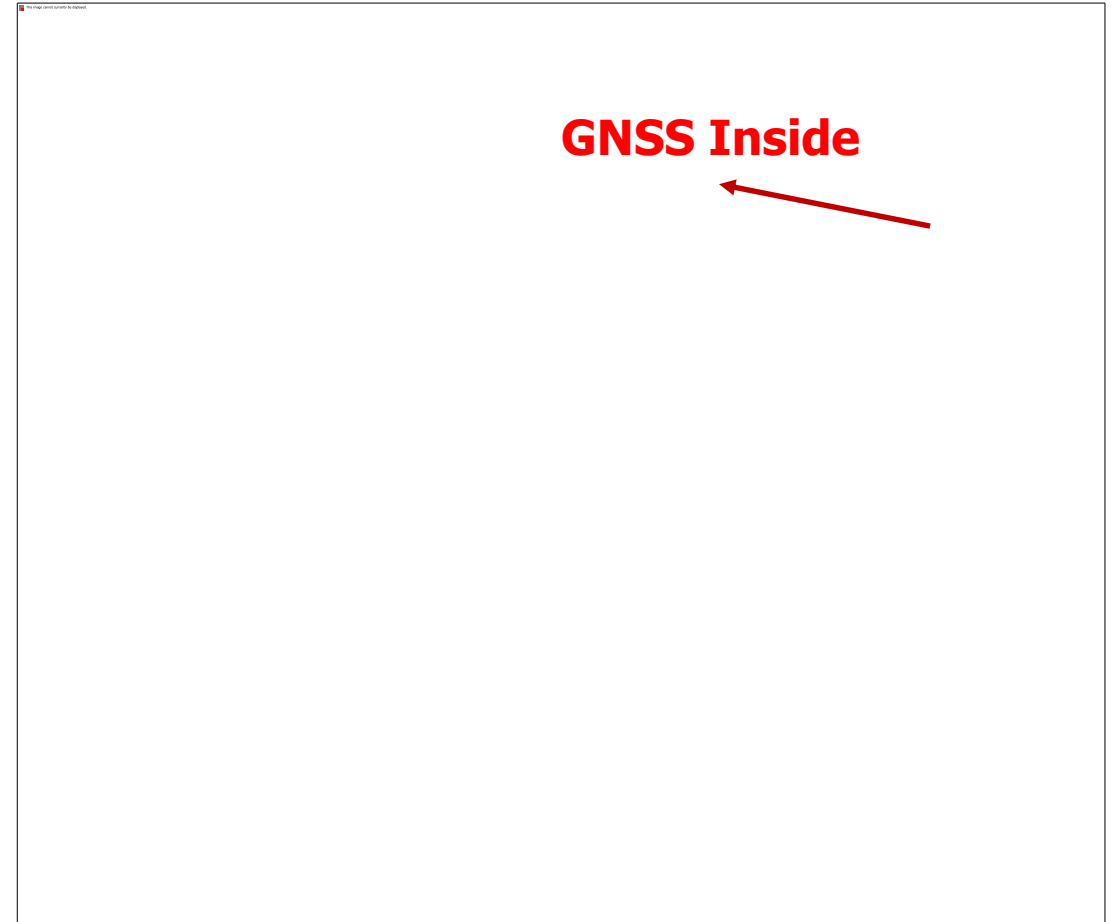
- Extended scalability
- Z-Blade GNSS-centric technology
- 240-channel 6G ASIC
- Anti-theft technology
- Long Range Bluetooth
- Trimble CenterPoint® RTX



Patented inside-the-rod mounted
UHF antenna design



Establishment of GCPs for Post Processing of Drone Survey Data



MOST IMPORTANT PROCESS AS ACCURACY OF IMAGES DEPENDS ON THE ACCURACY OF GCP'S

Insight2.0 For Mapping

Fully autonomous

- Uses our proprietary commercial grade flight control HW & SW.
- Vertical Take-off and landing

Survey grade accuracy

- Delivers **4-5 cm absolute accuracy** in survey data enabled by unique **on-board PPK GPS technology**

Large area coverage

- **> 100 Hectares** in single flight at 3.5 cm/pixel image resolution
- Endurance greater than **40 minutes**

Light weight & portable

- **Only 3600 grams.** Allows easy and quick deployment in tough terrains with limited open area. Can be carried by 1 person

Multi-application

- Topography mapping & surveying
- Industrial inspections
- Precision agriculture

Salient Features

- Ability to operate in high Electro magnetic interference
- Obstacle Detection and Collision Avoidance System

Insight just got smarter and better.

With better endurance and area coverage.

DGCA APPROVED.



Insight-PPK Multicopter Drone

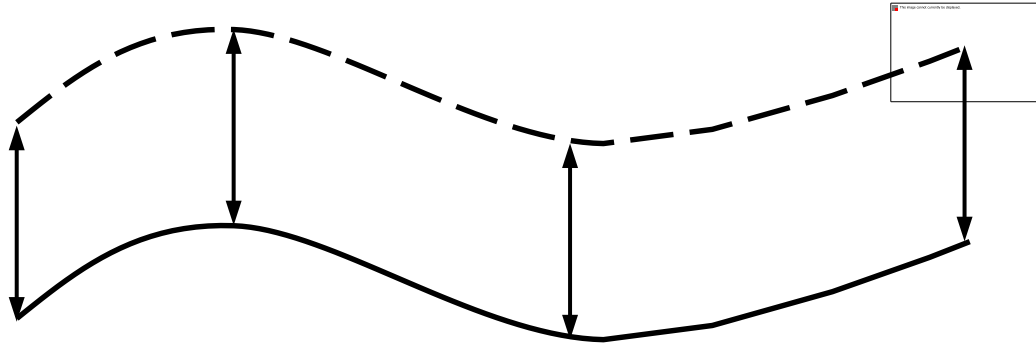


Fig 1: UAV with terrain-following

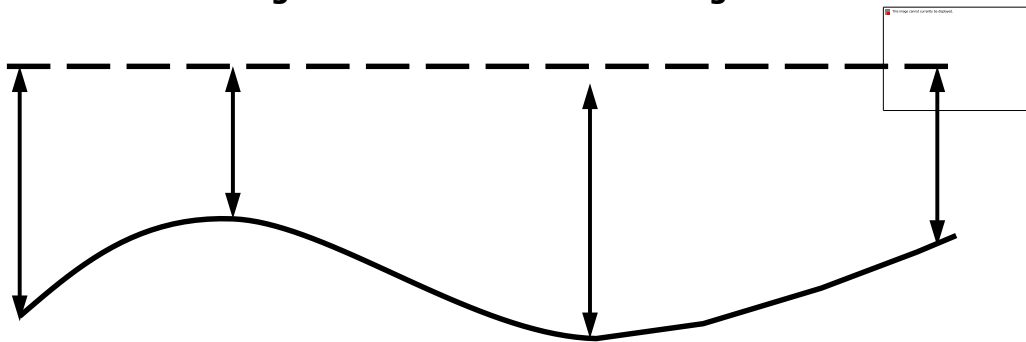


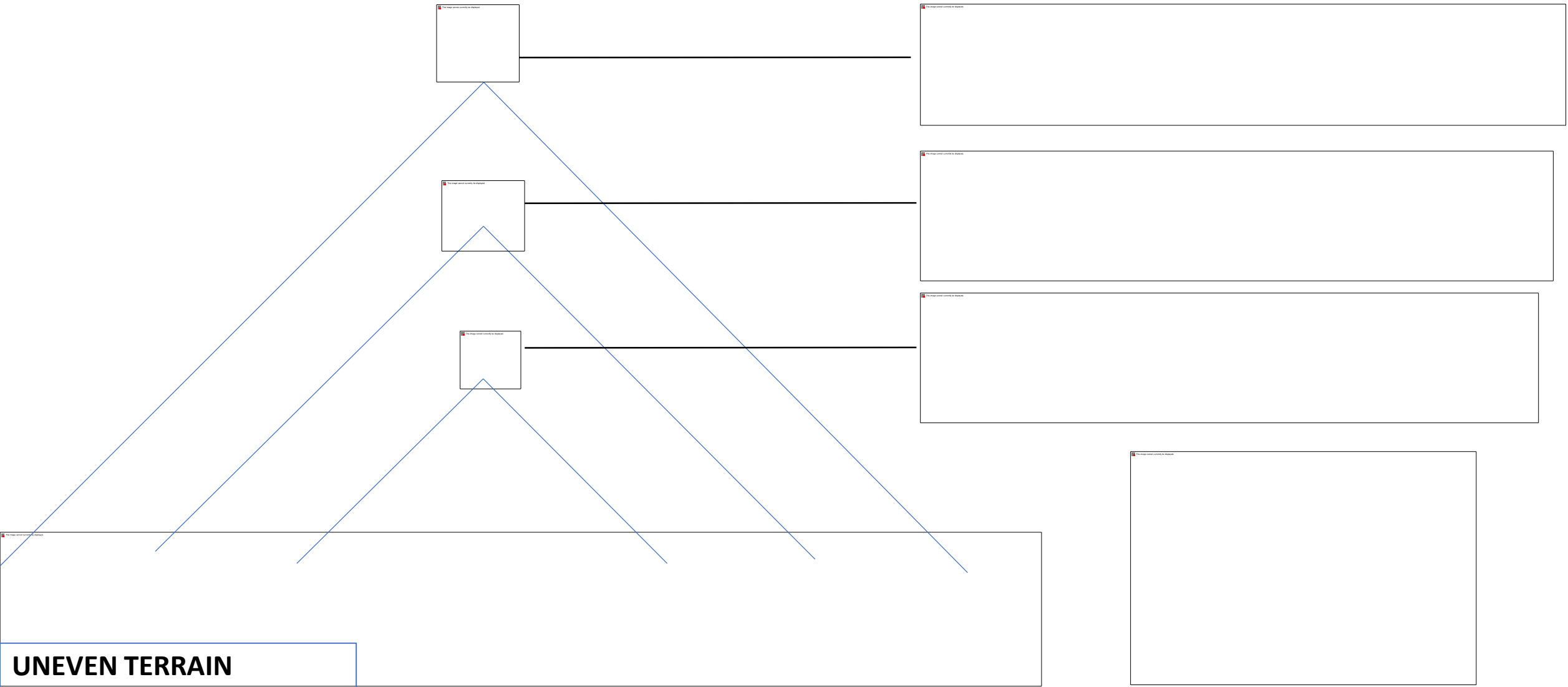
Fig 2: UAV without terrain-following

Failsafe Features

- Terrain following Feature
- Automatic Return to Home on Low Battery
- Automatic Return to Home on Communication Failure



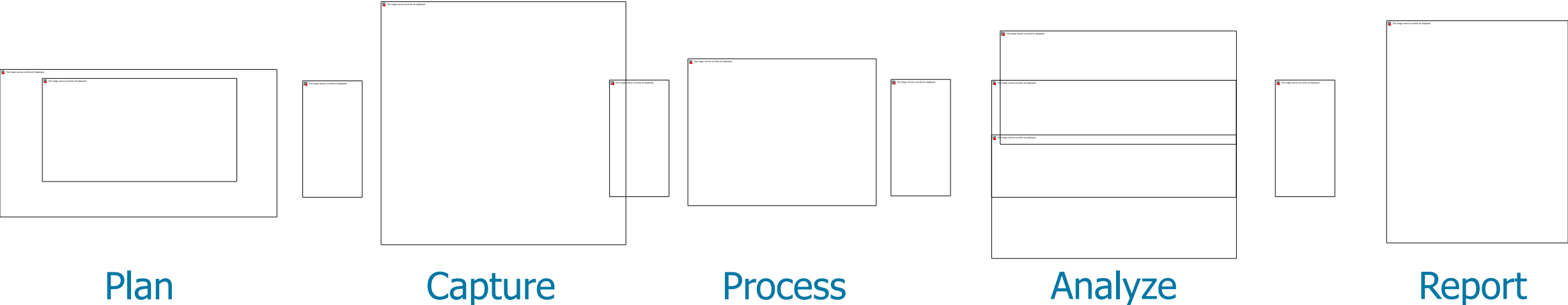
Why to really use drones?



UNEVEN TERRAIN

Drones can do all the dull, dirty, dangerous and repeatable jobs better, faster and cheaper

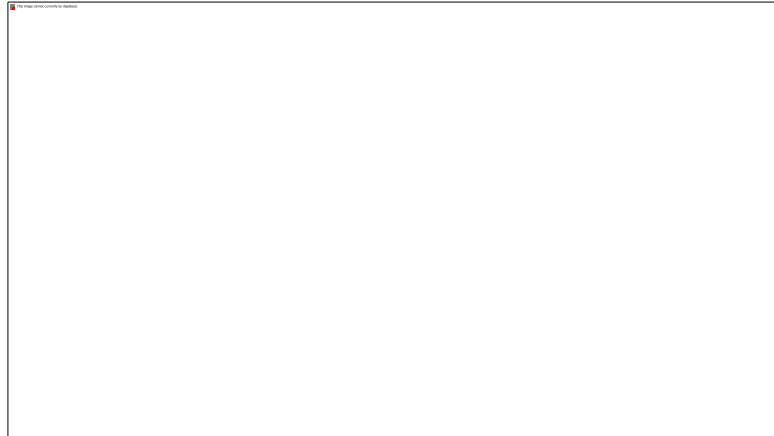
The holistic Survey Methodology



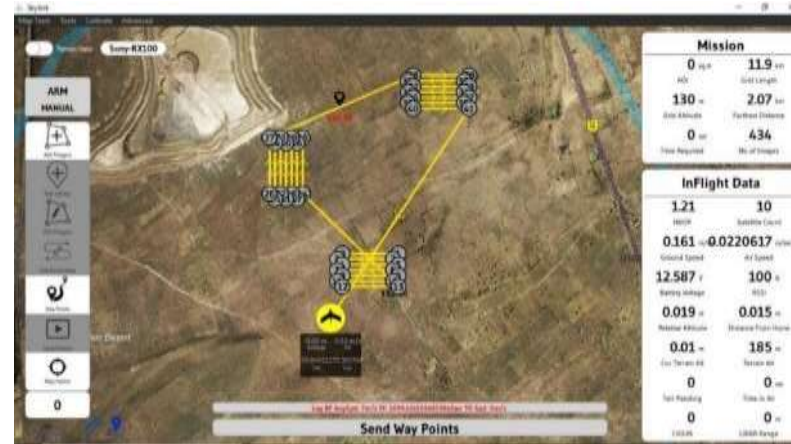
Enterprises are seeking for long term and robust end to end solutions



Planning



Master Mission Capability



Multi-Polygon Flight planning



Corridor Mapping

ADVANTAGES

1. More accurate and precise flight planning with **up to 1.5x time saving** in flight planning compared to conventional flight planning softwares.
2. Chances of flight **planning errors reduced by up to 3x** because of the master mission capability.
3. Multi-polygon flight planning **saves up to 2.5x time in data capturing** because of efficient flight planning and no requirement of landing the drone to fly the next polygon even if the drone has sufficient battery.



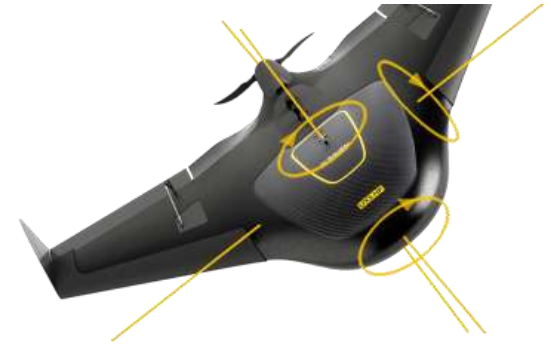
Post Processing Software

Trimble UASMaster / SPECTRA SPSO

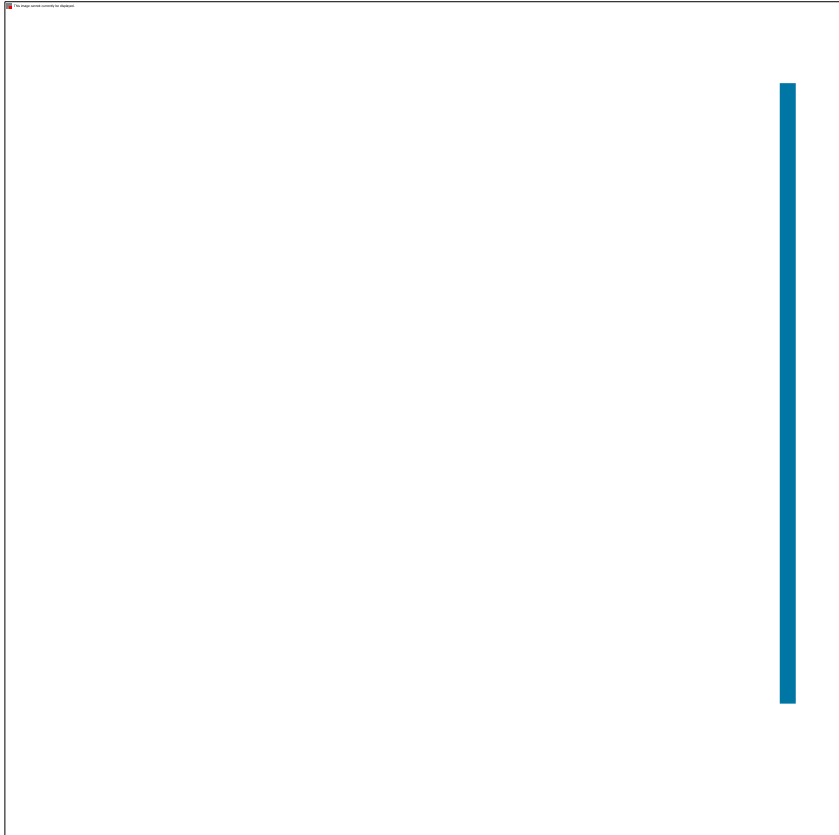
Complete Photogrammetric Workstation for UAS and Terrestrial Close-Range Imagery

Key Features:

- Complete photogrammetric workflow in one product
- Fully automatic geo-referencing, calibration, refinement and analysis
- Create colorized dense point clouds, surface models and bare earth terrain models
- Refine and edit terrain models, collect GIS data and vector maps on top of stereo 3D imagery
- Create digital orthophotos, classic orthos as well as true orthos
- Process data from any type of UAS and frame cameras
- Excellent results without requiring specialized photogrammetry knowledge or experience.



Outputs



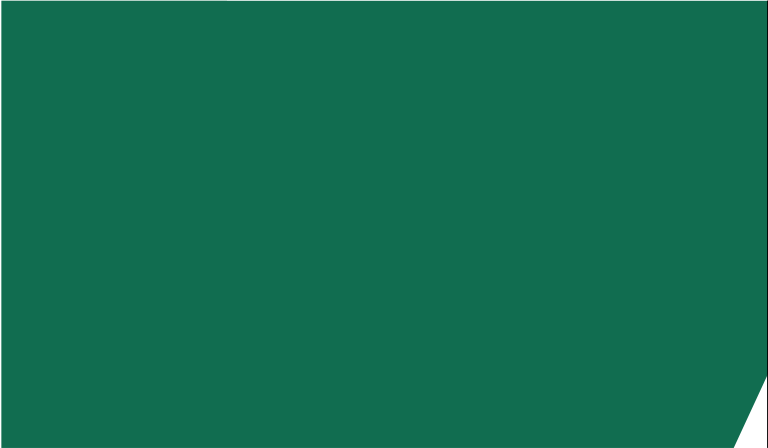
- **2D Orthophoto**
- **3D Point Cloud**
- **Digital surface Model**
- **Digital Terrain Model**
- **Contours**



d

3D Point Cloud

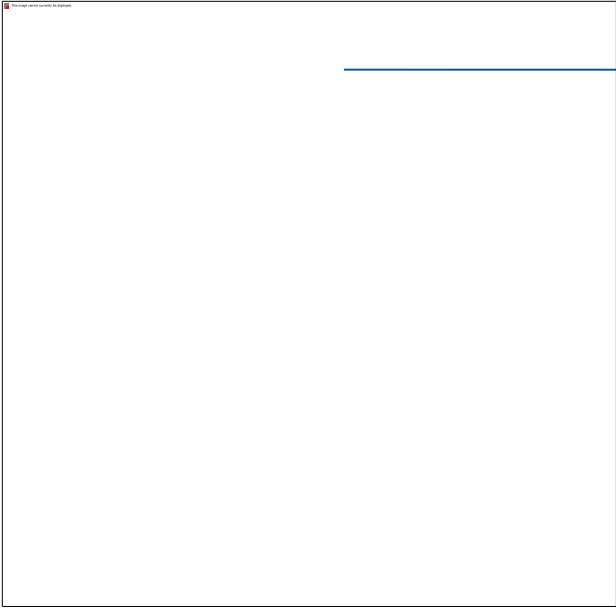




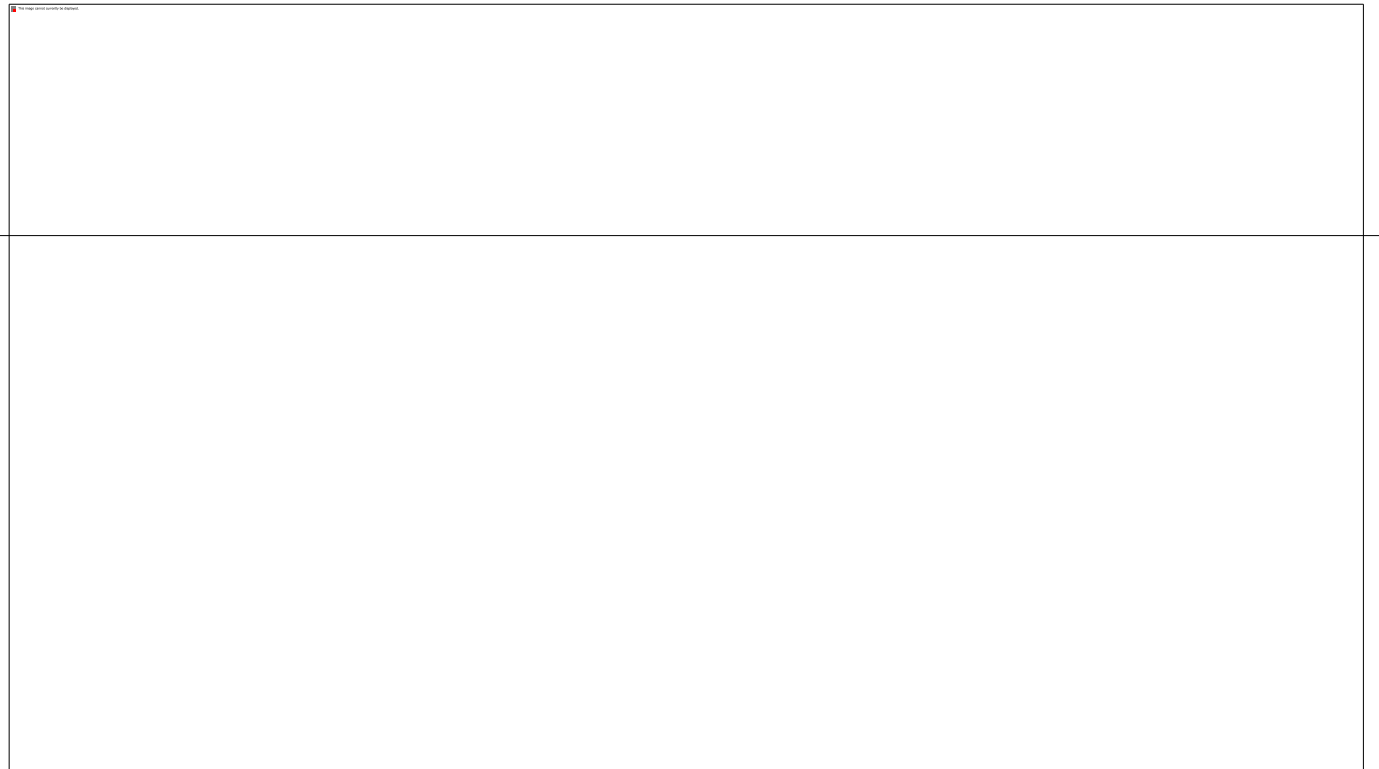
2D Orthophoto

Digital Surface Model

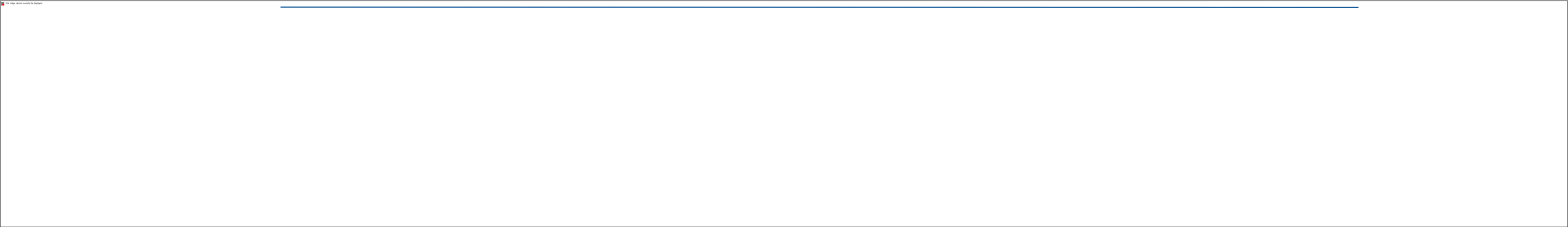




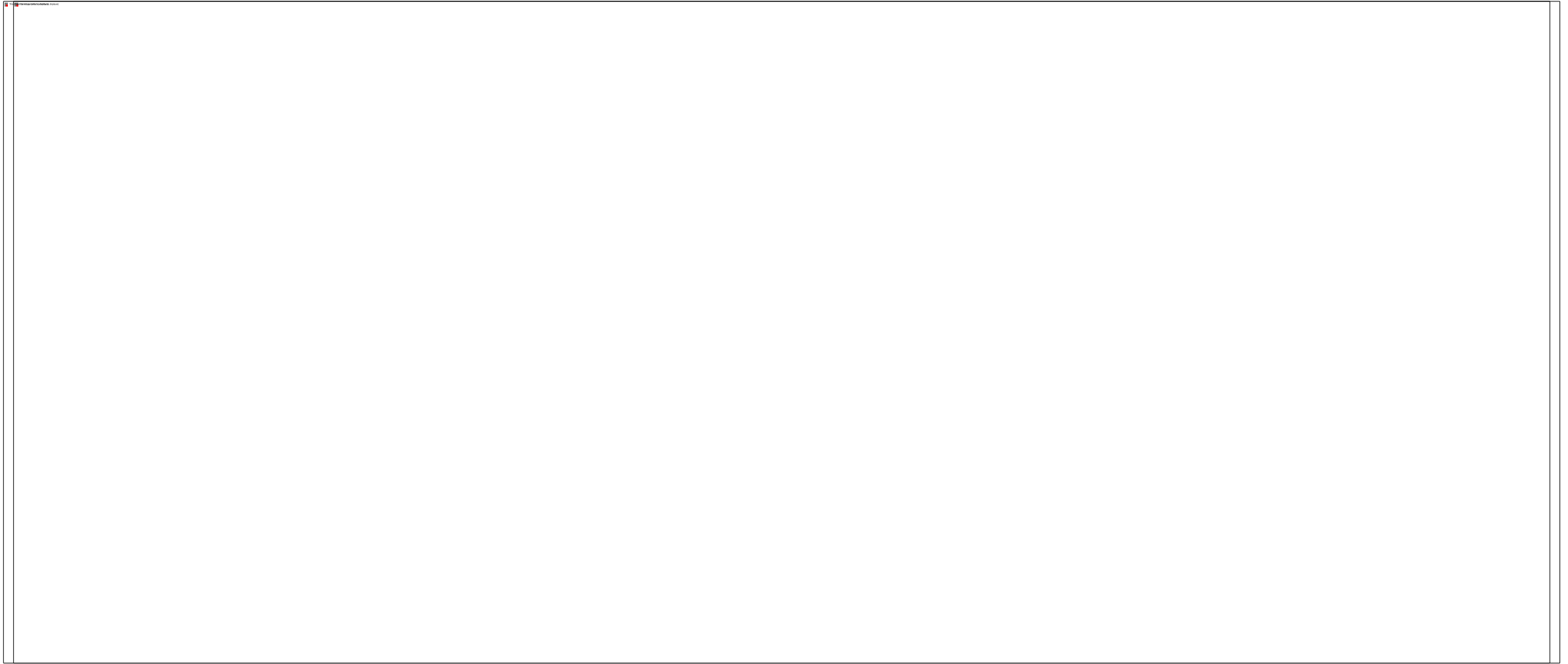
Digital Terrain Model



Contours 1m Interval



Feature Digitization

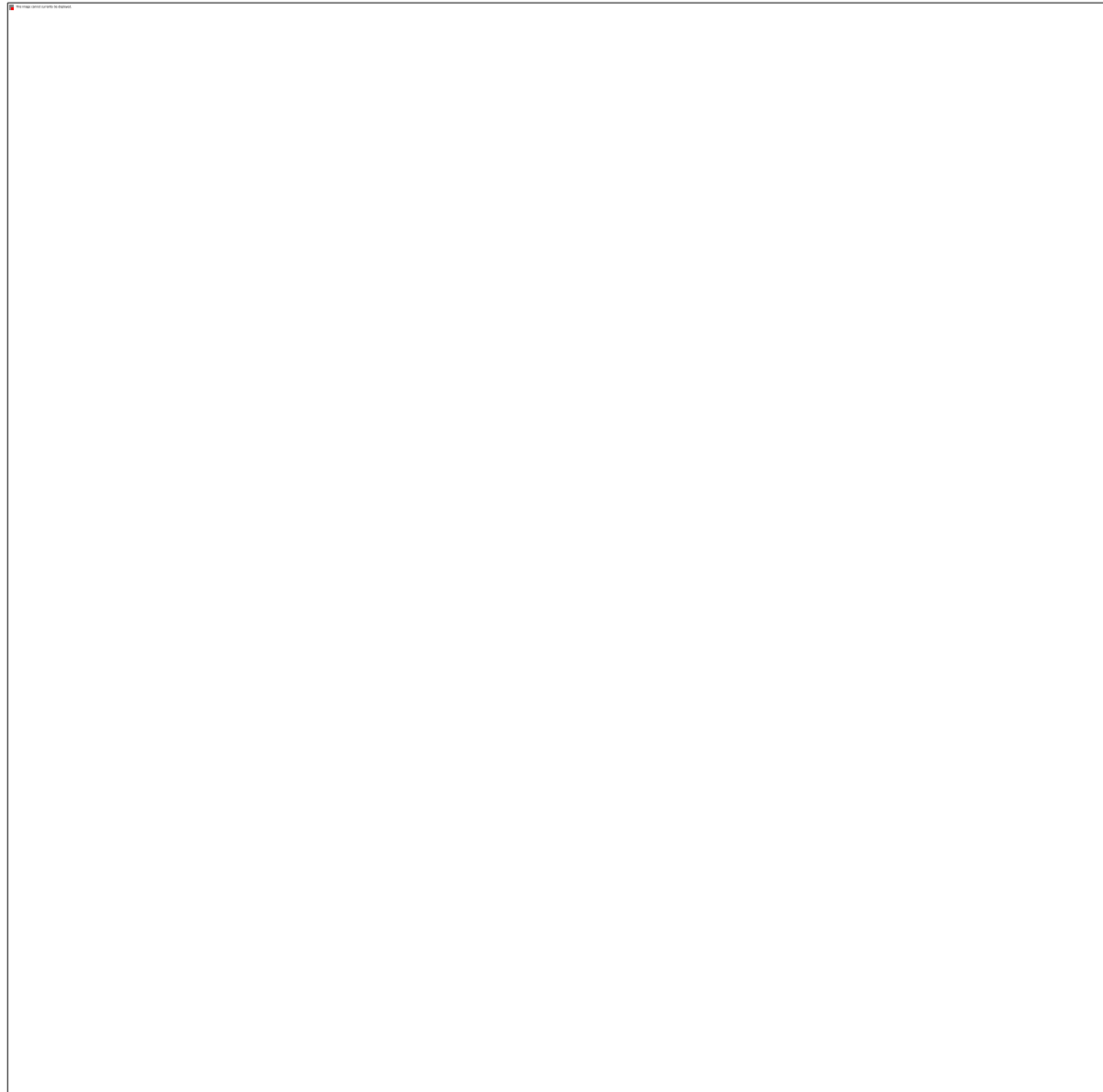


Area Computation



Data Processing Outputs

**OUTPUT-1: 2D Georeferenced
Orthophoto for the survey area.**



Case Studies

Survey Team is Acquiring Data in Field



IIT Kanpur

Case Studies



DNC Bhubaneswar

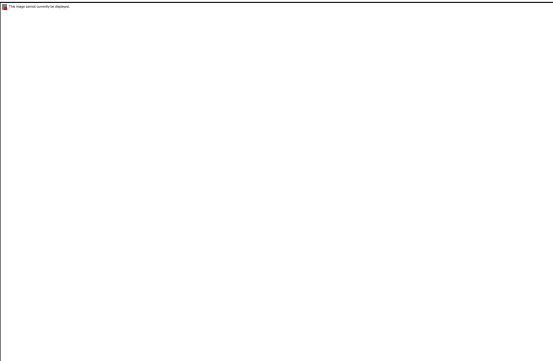
Case Studies



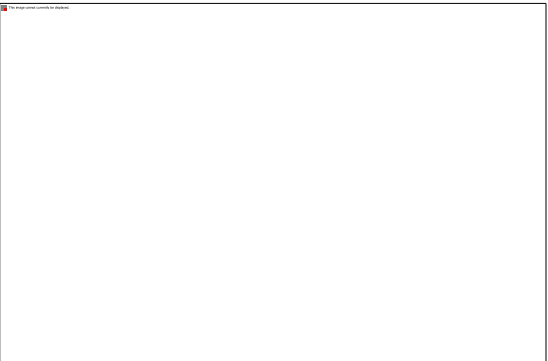
PWD, Mizoram



GNSS Enabling Ground Truthing and Ground Validation



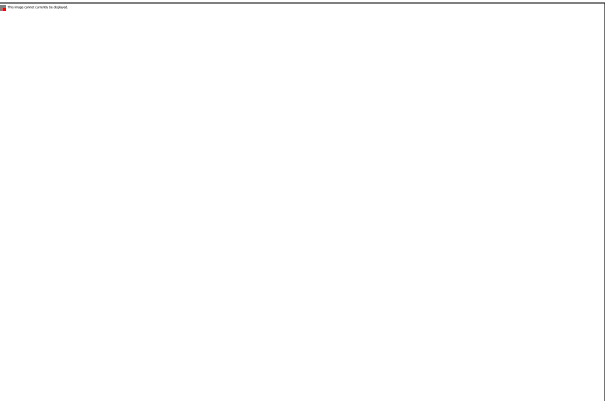
BOUNDARY IDENTIFICATION ON FIELD



GOVT LAND VERIFICATION ON FIELD



Reconciliation Report



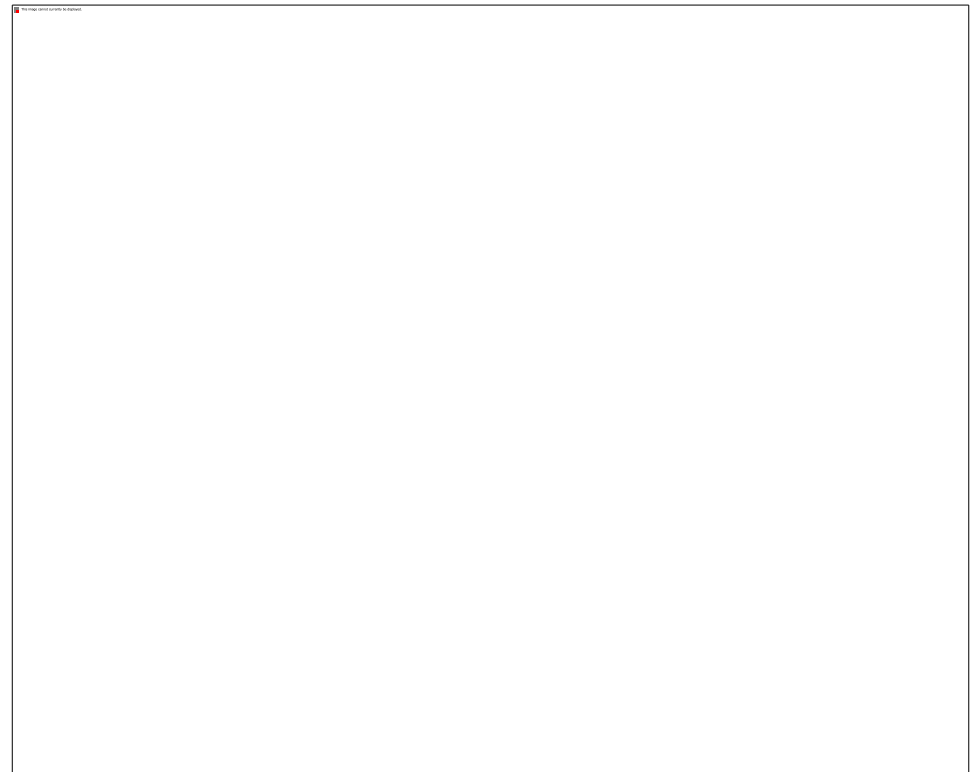
Measurement & Subdivision of Actual Land



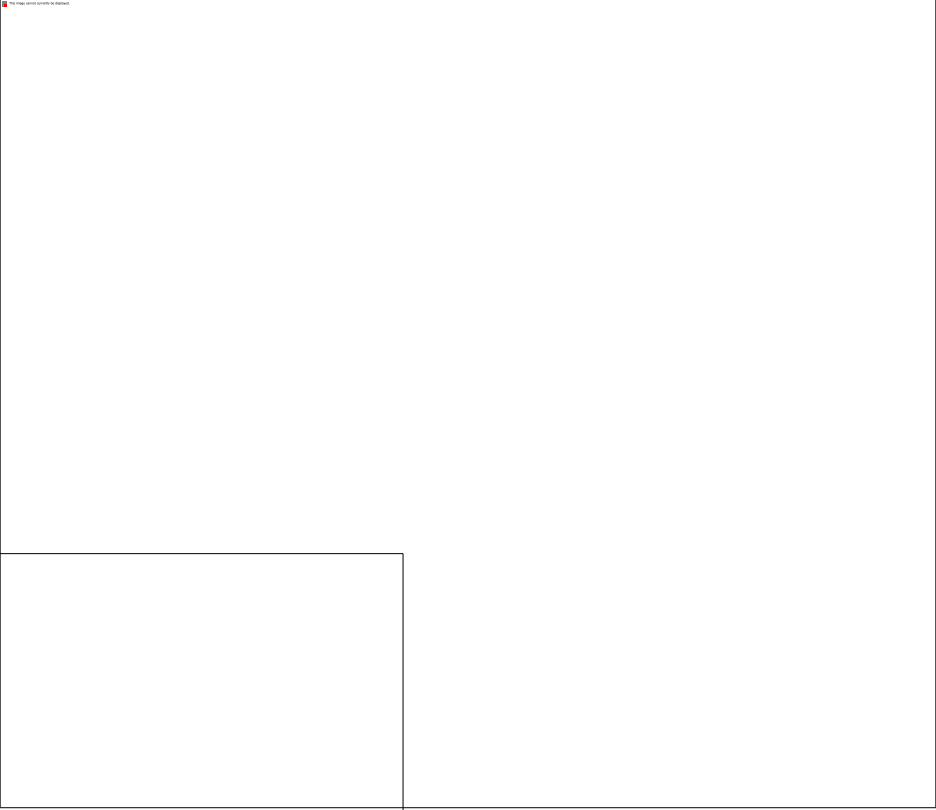
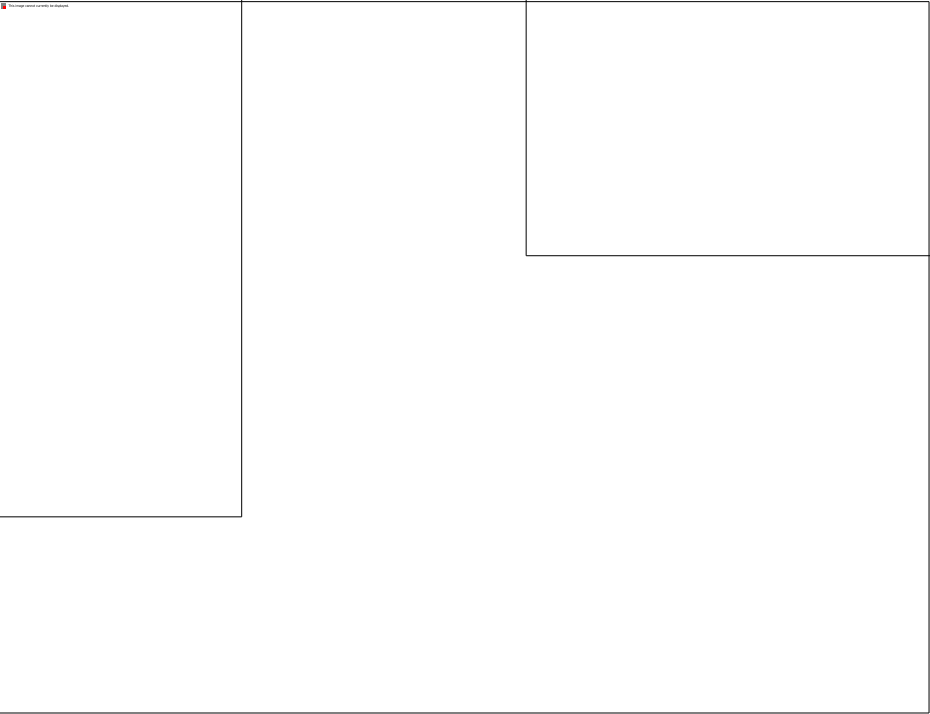
CORS Network enables On-Call Surveys in timebound manner

GNSS Field Controller

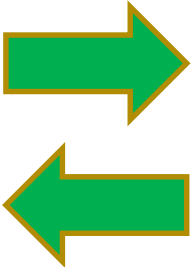
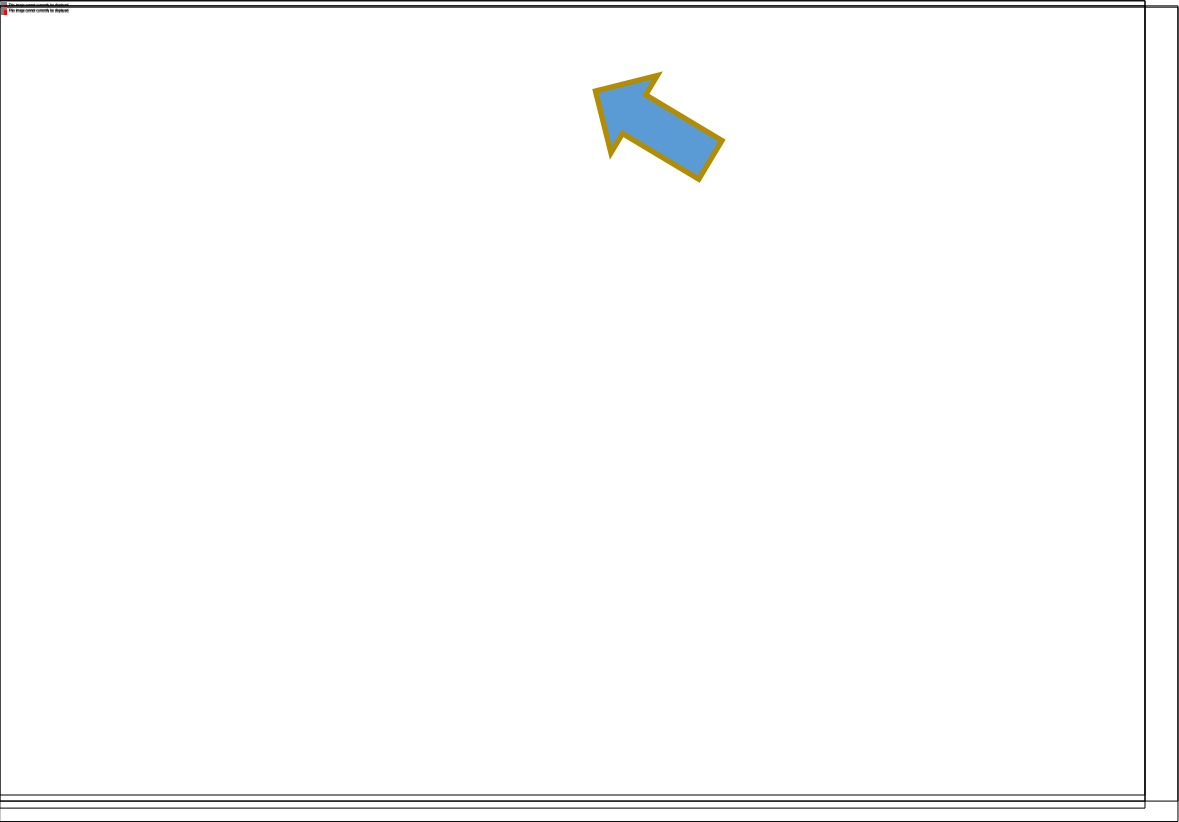
ALLOWS YOUR DIGITIZED MAP IN BACKGROUND IN THE FIELD



Ground Truthing & Attribute Collection

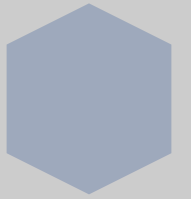


Data Synchronization



Field to Finish

Thank
You!



“Looking forward
to privilege of
working together
for achieving best
results in our
work.”

For Questions/feedback contact:

Vivek Bansal, Vice President

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Mob : +91 9871091371

Email : vivekbansal@panindiagroup.com