

Unmanned Ground Sensors

PMMI P-ISR Sensor Demo

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Video, IP
and Sensors



Broadcast



Covert Audio
and Video



C2 Software
Solutions



Tagging, Tracking,
Locating and Cellular

Company

- DTC (formally Cobham TCS) has been at the forefront of innovation for over 25 years, developing leading edge surveillance and communication technologies for successful operations in demanding environments, from cities, to the digital battlefield.
- As a leading designer of wireless communication technologies, DTC works with military, law enforcement, counter-terror units, governments, corporations and system integrators providing key surveillance and communication solutions for the challenges they have.
- DTC's award-winning technologies: Strategic Command & Control software, audio surveillance, video surveillance, IP mesh solutions, wireless broadcast solutions, cameras and sensors, tagging, tracking, locate and intercept, tactical communications and integrated surveillance solutions



Unmanned Ground Sensors

- Over 25 years experience of radio based unattended ground sensor solutions
- Supply to Military and law enforcement organisations
- Applications:
 - Covert rural and remote surveillance
 - Protection of operational personnel
 - VIP protection
 - Asset protection
 - Border protection
 - Intelligence gathering



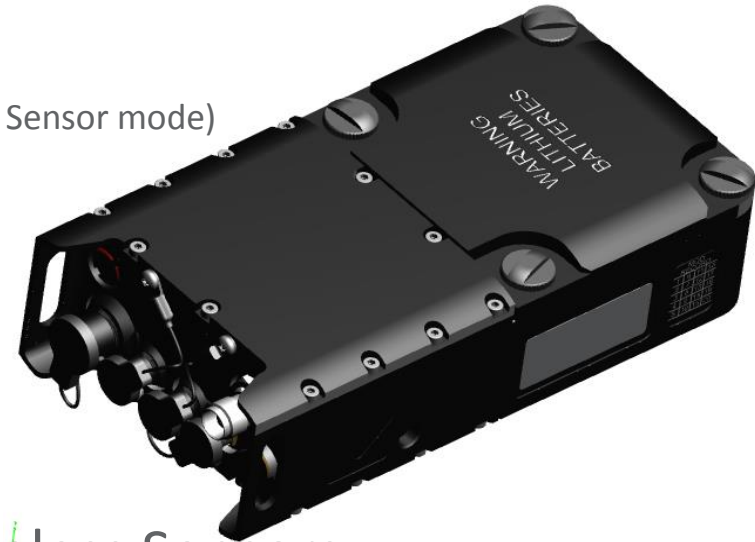
Technology

- Unmanned Ground Sensors to detect border incursion at key locations along a border
- Sensors to detect movement by different physical properties
 - Magnetic
 - Passive Infrared
 - Seismic
 - Make-Break
- Sensors have the ability to ‘wake-up’ deployed cameras
- Alarms are transmitted to a Central HQ (Destination Node)
 - Time, location and ‘event’ type (low rate data)
 - IP Mesh Radio (high rate data: video & still imagery)
 - Demonstration is via Phase 3 IP Mesh NetNode Robust 2W erp
 - Deliverable is via SOL8SDR IP Mesh NetNode (smaller fit-form-factor)



Nugget Phase 3

- Multi-hop Nugget Mesh capability
 - 153 – 176 MHz
- Purged IP67 housing
- Internal lithium 'D' cells (2-off):
 - Up to 90-days operation (one alarm per hour in Sensor mode)
- External power input (8-16V):
 - >180-days (BA5590, BA2590, M1)
- Internal Sensors
- Two External Sensor connections
- Capable of receiving alarms from Wireless Sensors



Nugget Internal Sensors

- Tamper Sensor
 - Able to detect movement of the Nugget when deployed
- Geophone Sensor:
 - Able to detect footfall and vehicle movement local to the deployed sensor
- Trip Wire Sensor:
 - Magnet and fine 'Spider Web' thread (Make-Break)
- GPS Receiver
 - Stores GPS positional data locally on the Nugget



Nugget Modes

- Destination Node:
 - Connected to a laptop/tablet
 - Displays alarm received via the Nugget Mesh
 - Utilises DTC's Mission Commander Command & Control software
- Network Node:
 - Receiver running continuously to relay alarms through the Nugget Mesh network
 - Wakes up IP Mesh NetNode in order to transmit video/still imagery
- Sensor Node:
 - Operates in lowest power state with receiver off except when alarm is generated or a confidence pulse has been transmitted



Nugget External Sensors

- Long Range PIR:
 - 100m range
 - Left-Right or Right-Left Alarm
 - Tripod/ground spike mounting options
- Mini PIR:
 - 5m range
 - 2m integrated cable
 - 150mm ground spike



Nugget External Sensors

- External Geophone
- Magnetic Sensor
- Make-Break Sensors:
 - Mini PIR
 - Pressure Pad
 - Make-Break Switch
 - Tilt Switch
 - Reed Switch
 - Proximity Sensor
- External Sensors are connected via Nugget Interface Box



Nugget Deployment Aid

- Development of a deployment aid to confirm correct Nugget operation is next on the roadmap
- Used during setup & deployment to confirm operational
- Bluetooth from a Nugget to rugged hand-held device



NP3-HUB

- Allows >2 external sensors to be connected to the Nugget
- Can be used to connect external power
- Two units can be 'daisy-chained' together
- All sensors interrupt driven to minimise power consumption
- 2m integrated cable
- Available end of March '17



Wireless Sensors

- Wireless Sensors supported using Miniature Sensor Transmitter (MST)
- Allows Make-Break sensors to wirelessly communicate with the Nugget
- Sensors:
 - PIR
 - Pressure Pad
 - Make-Break Switch
 - Tilt Switch
 - Reed Switch
 - Proximity Sensor
- Future development of wireless sensors on roadmap



Miniature Sensor Transmitter (MST)

- Short range wireless sensor transmitter:
 - Mini PIR
 - Pressure Pad
 - Make-Break Switch
 - Tilt Switch
 - Reed Switch
 - Proximity Sensor
- IP67 housing environmentally tested to DefStan 00-35
- Lithium ½ 'AA' cell
 - Approximately 6-months deployment lifetime
- Integrated antenna
- Legacy & 3rd Party Make-Break Sensors can be integrated



Future Wireless Sensors

- Preliminary schemes for wireless sensors options produced
- Development will start following the Nugget Deployment Aid



Wireless Geo



Wireless PIR



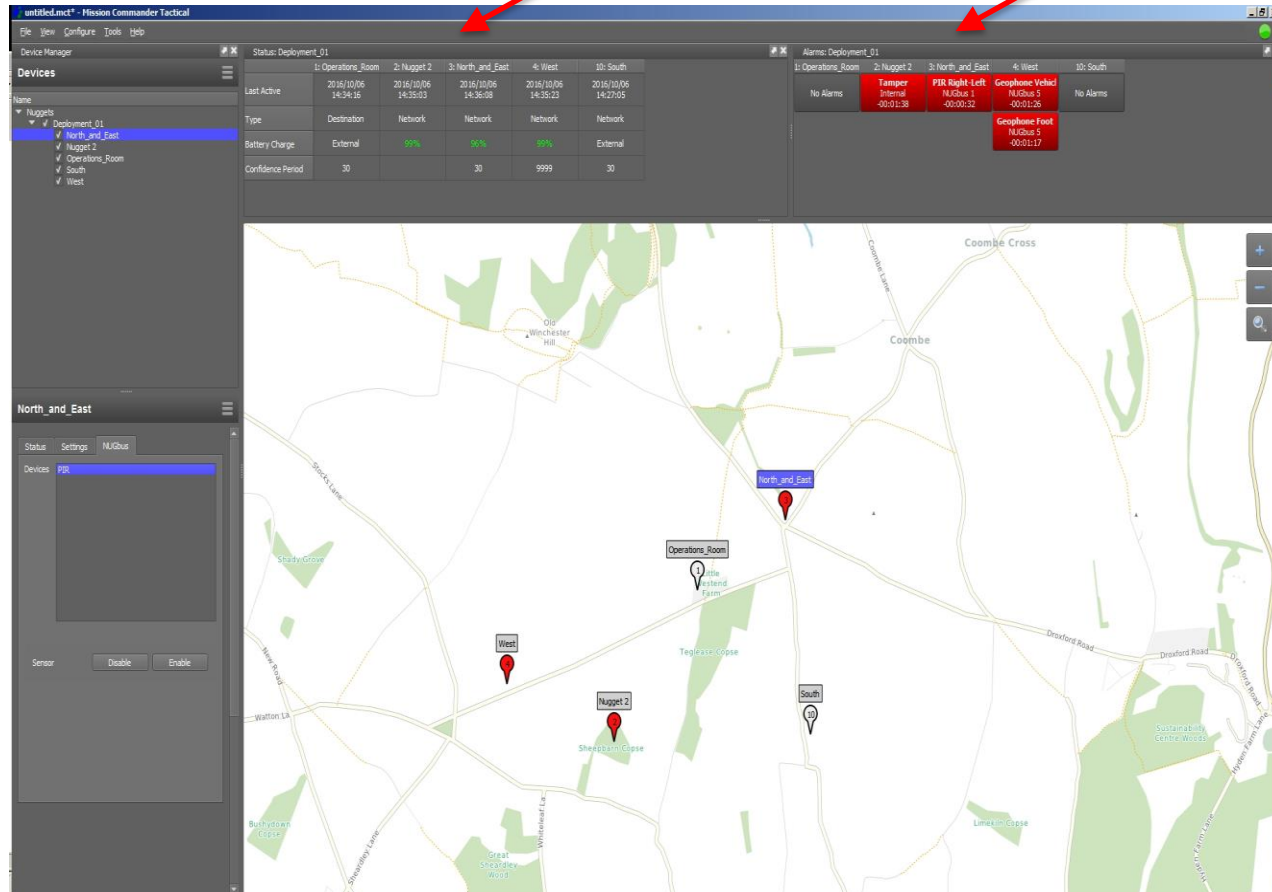
Mission Commander C² Interface

Status
Window

Alarm
Window

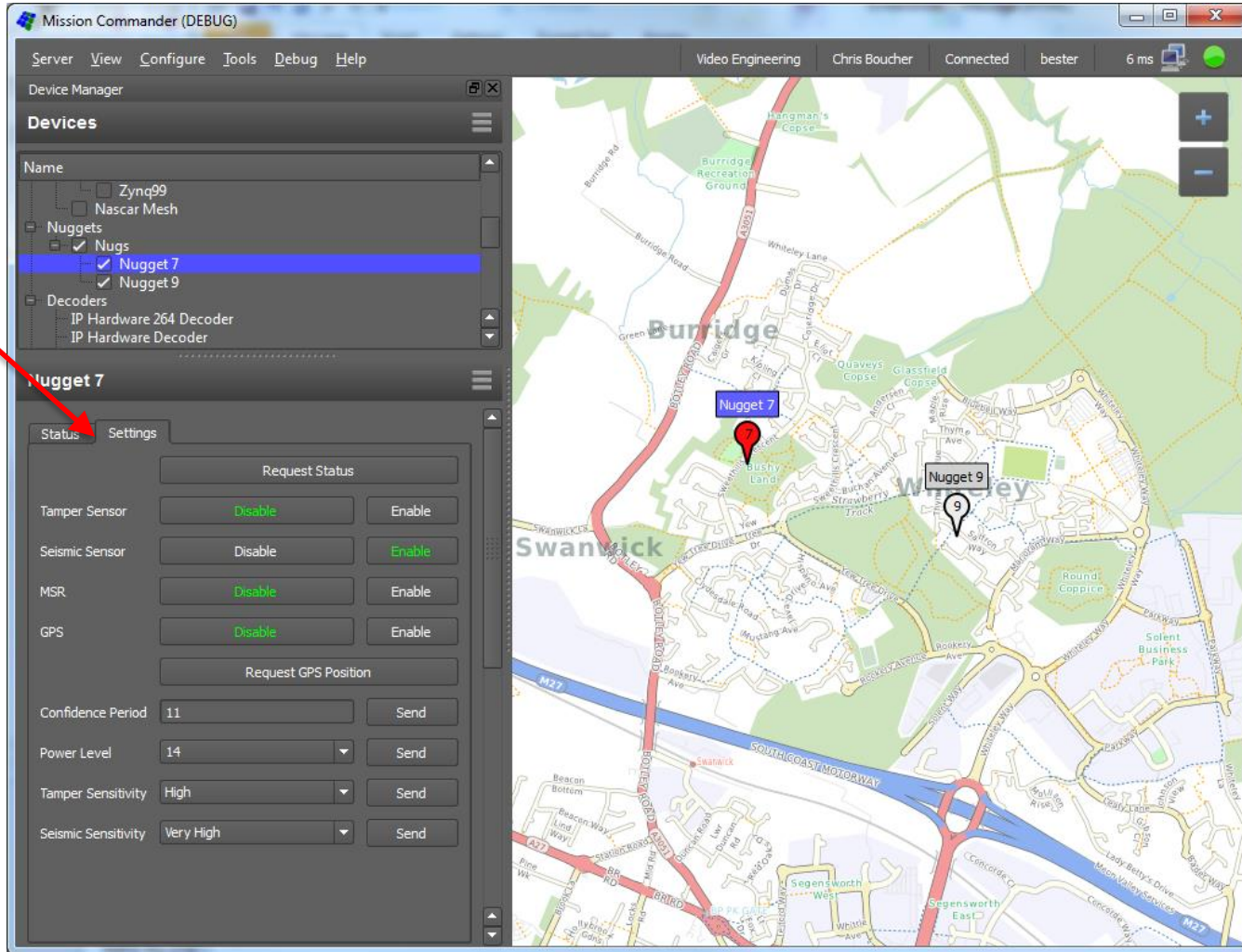
Device
Window

Nugget Status
Window

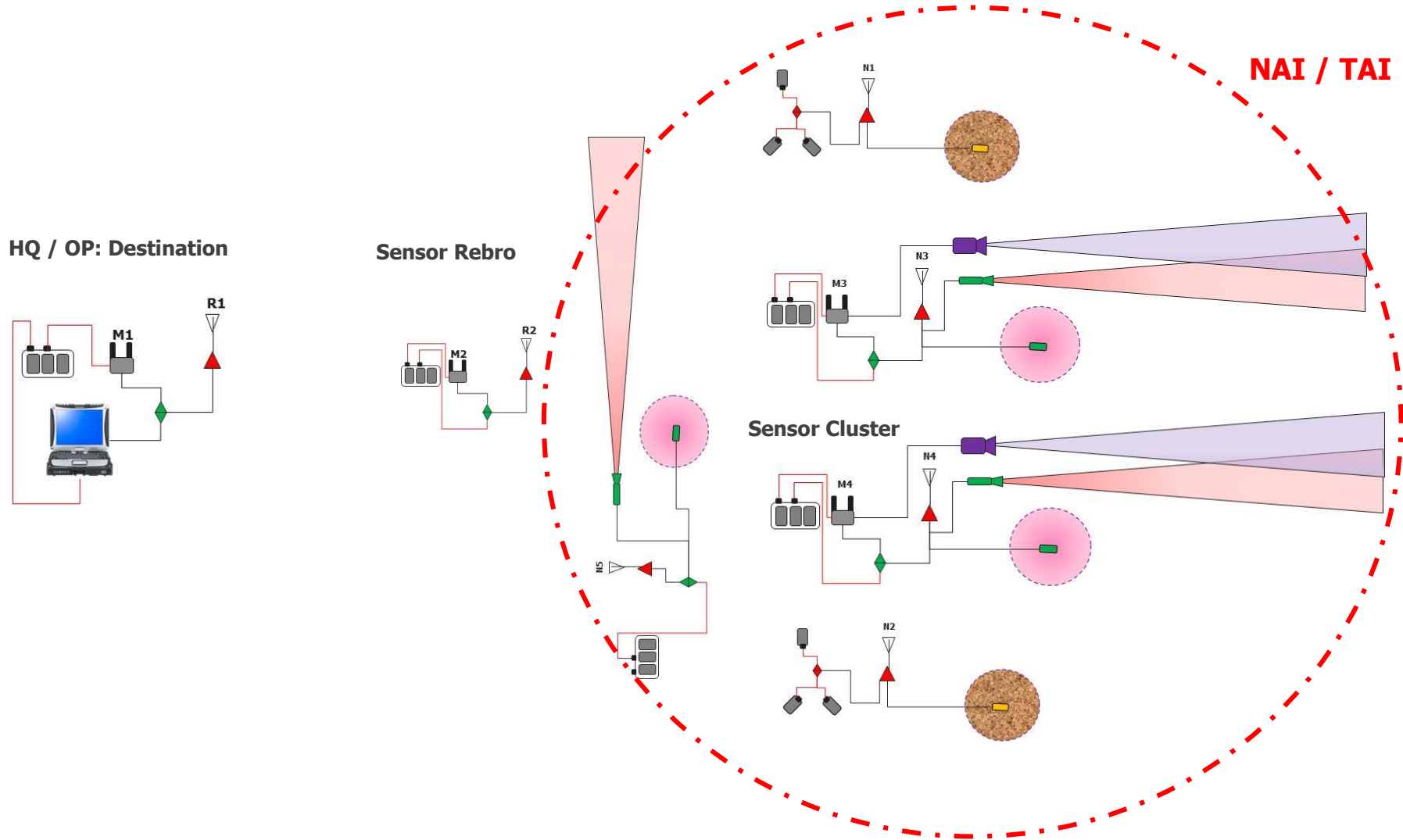


Mission Commander Nugget Settings Tab

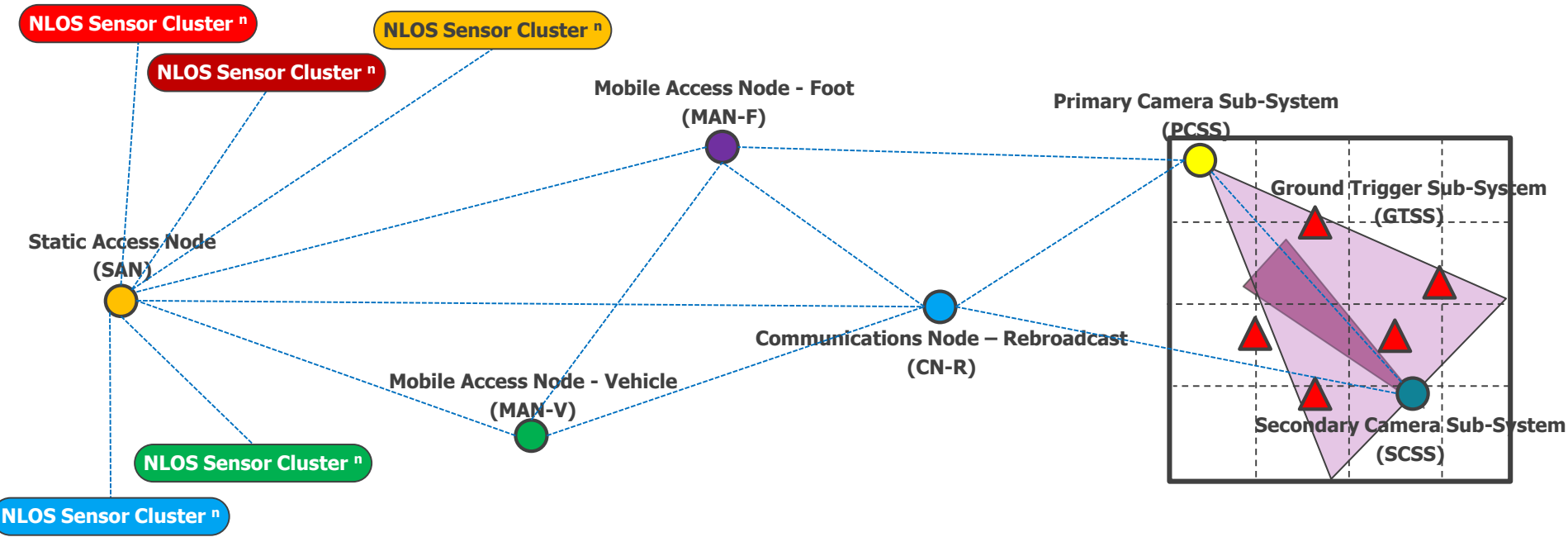
Nugget
Settings Tab



Deployment Architecture



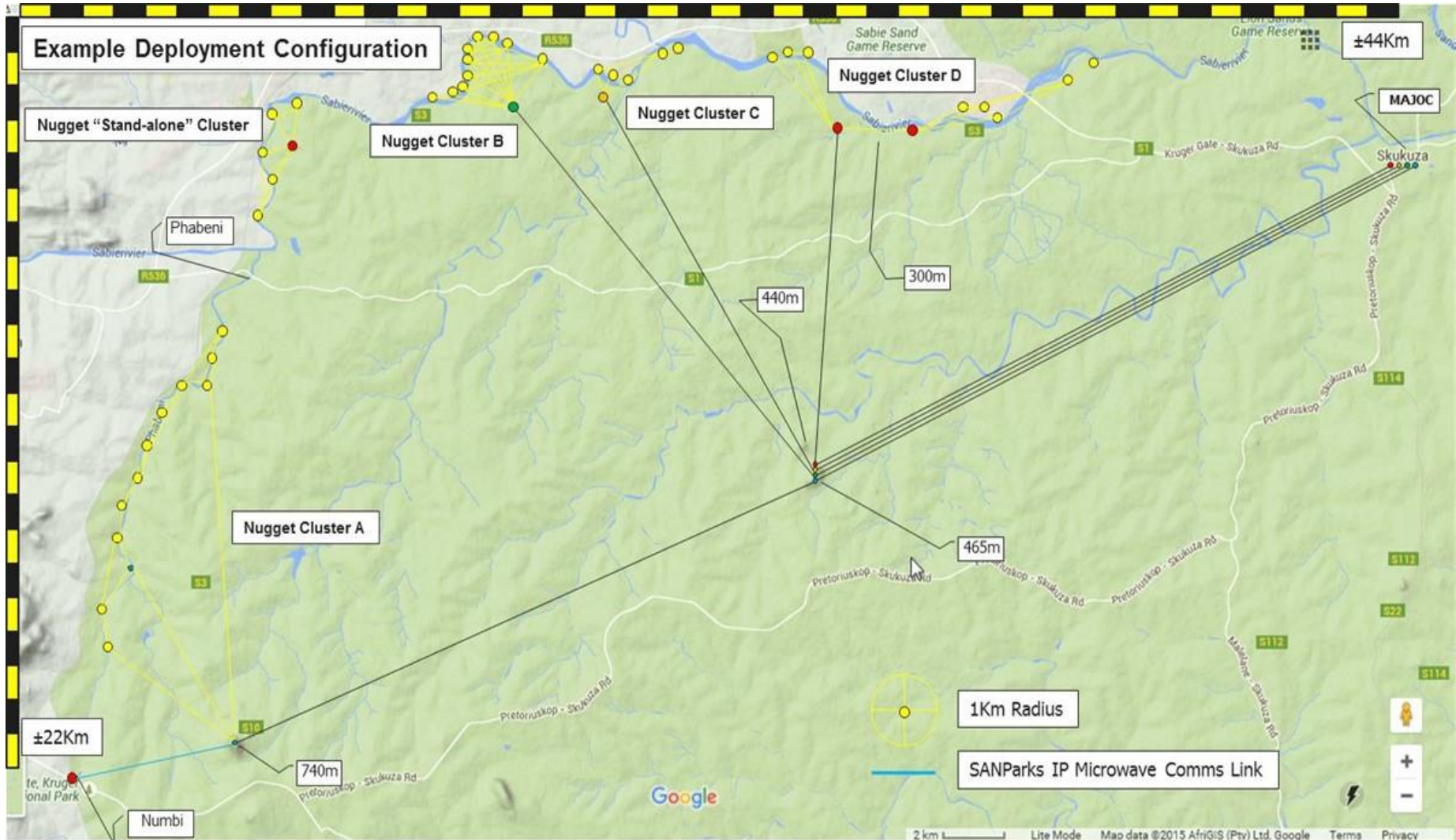
Pattern of Life Surveillance



OP / Patrol Base / FOB	Range >10Km	Range <2Km	Range <2Km
NLOS Sensor Cluster	LOS Communications Link	NLOS Comms Link	NLOS Sensor Cluster ⁿ



Linear Feature Surveillance

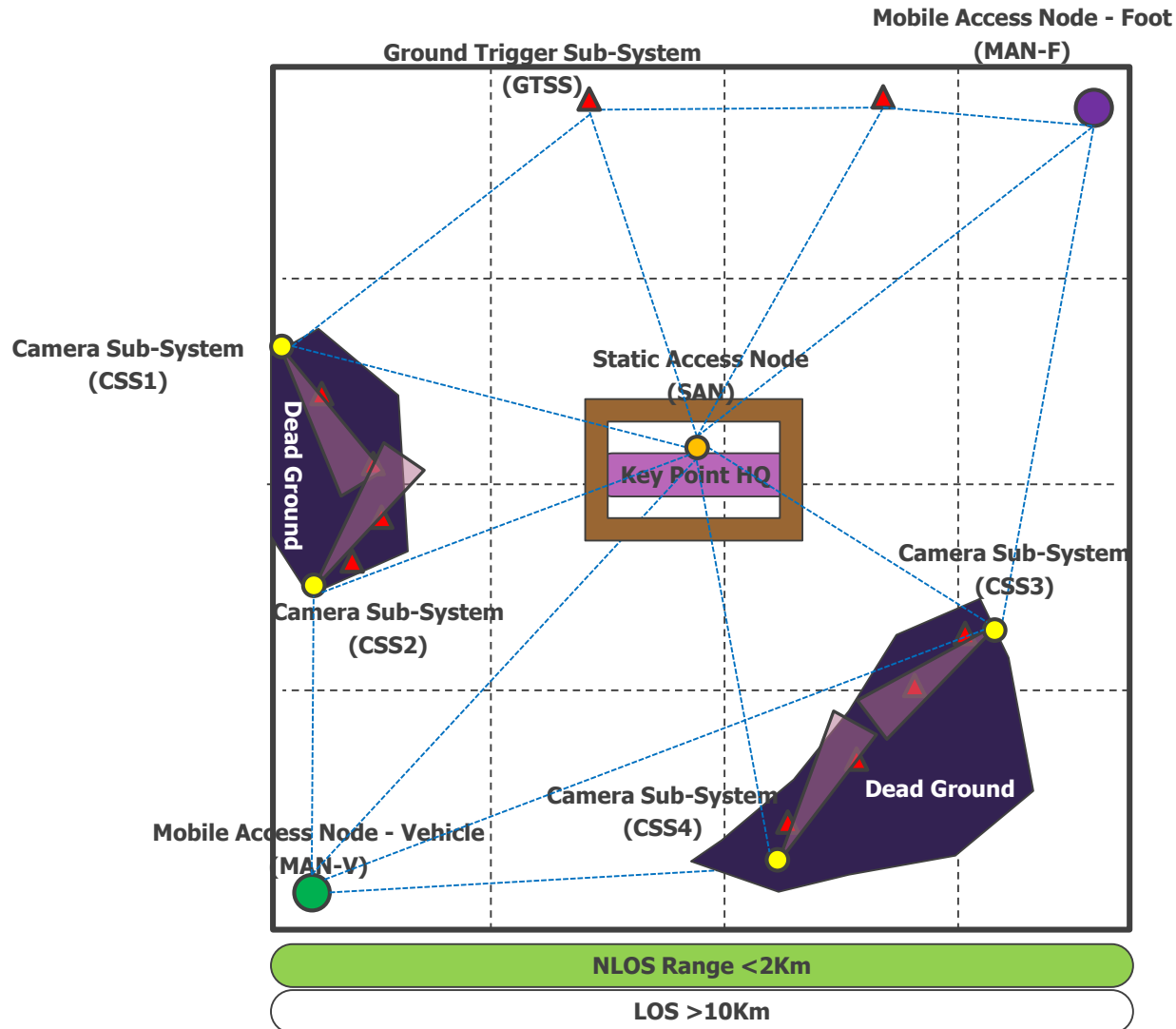


Border Security

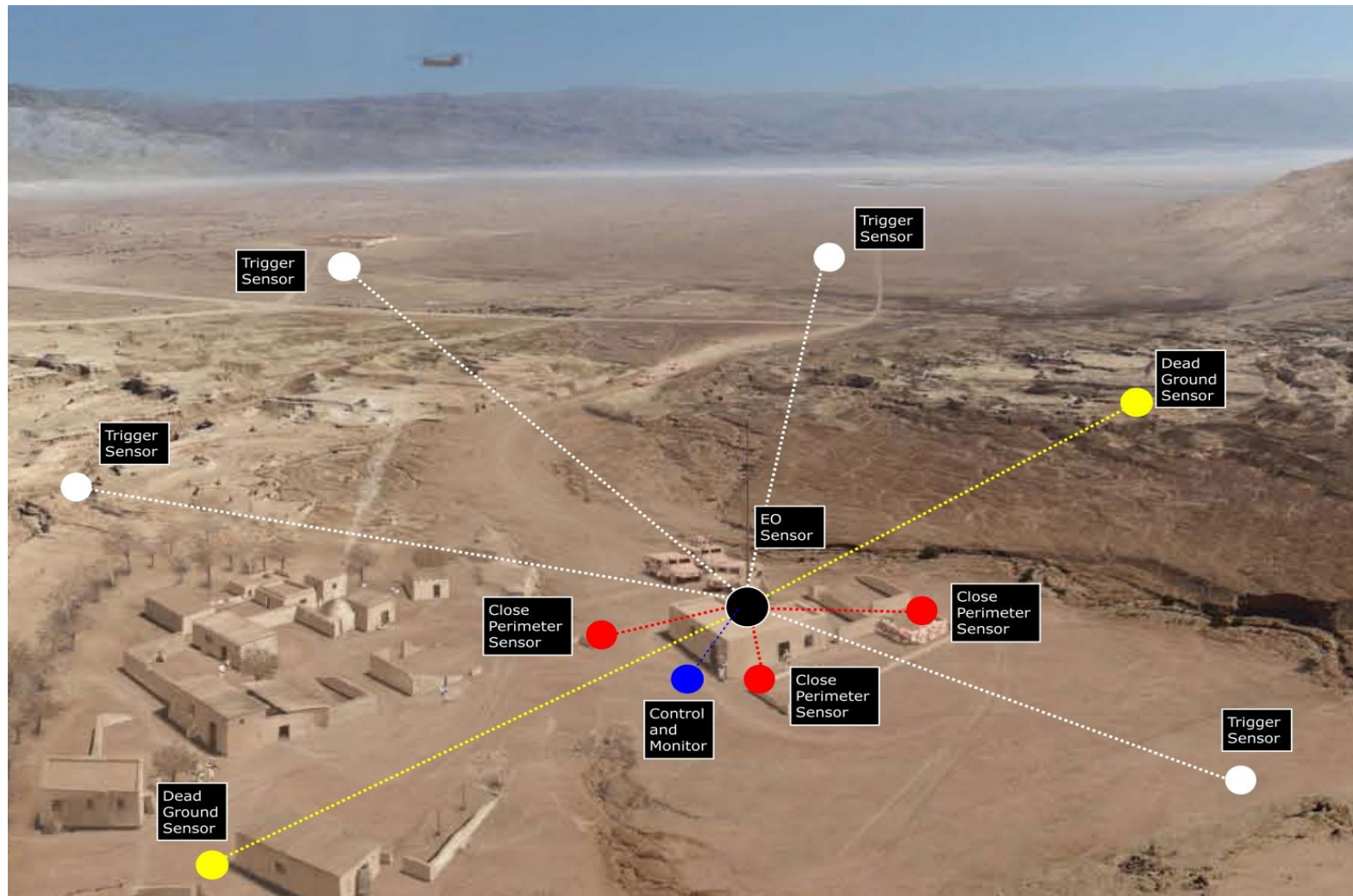
- Drug trafficking
- Human trafficking
- Anti-Poaching



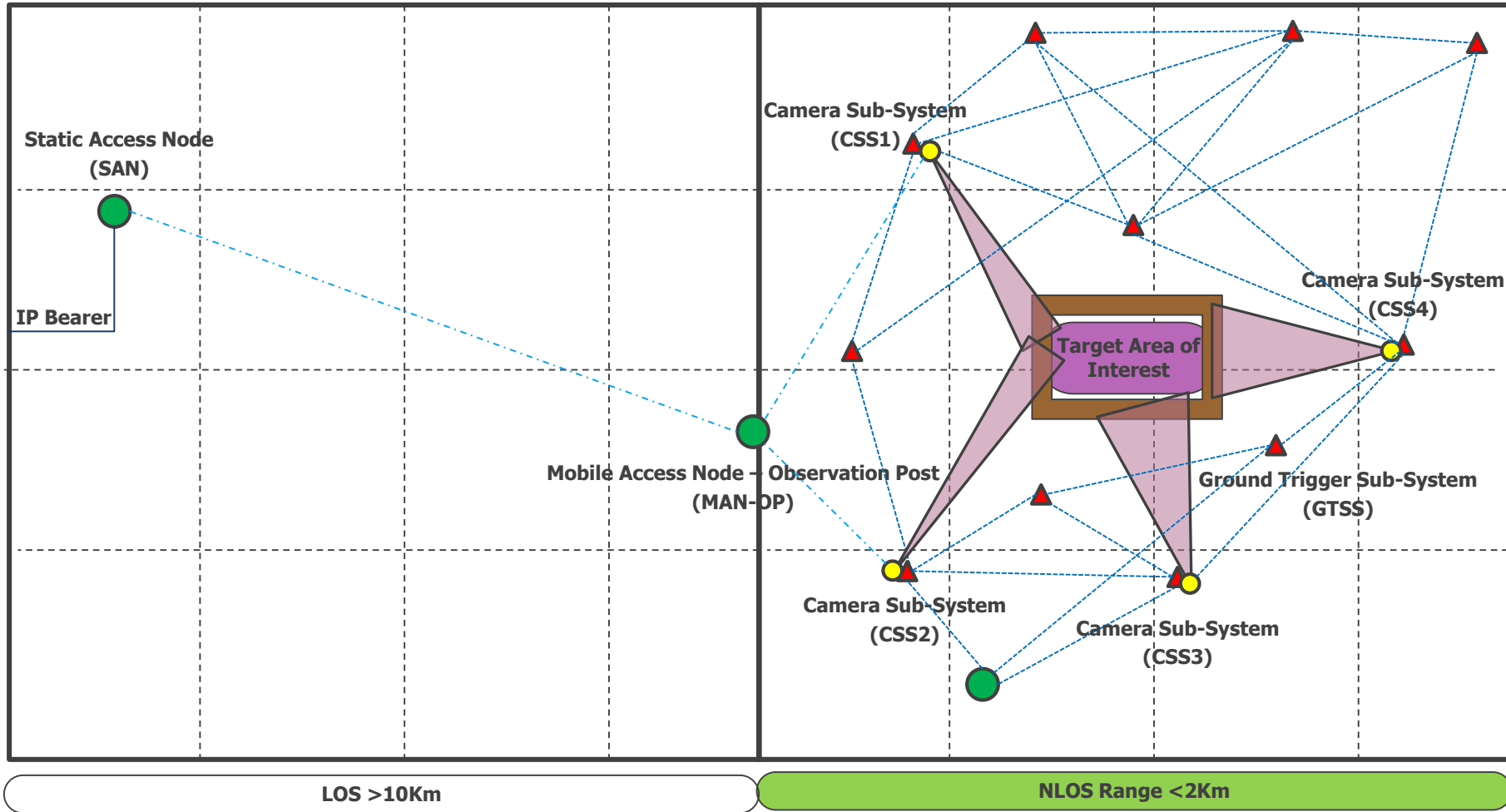
VIP & Key Point Protection



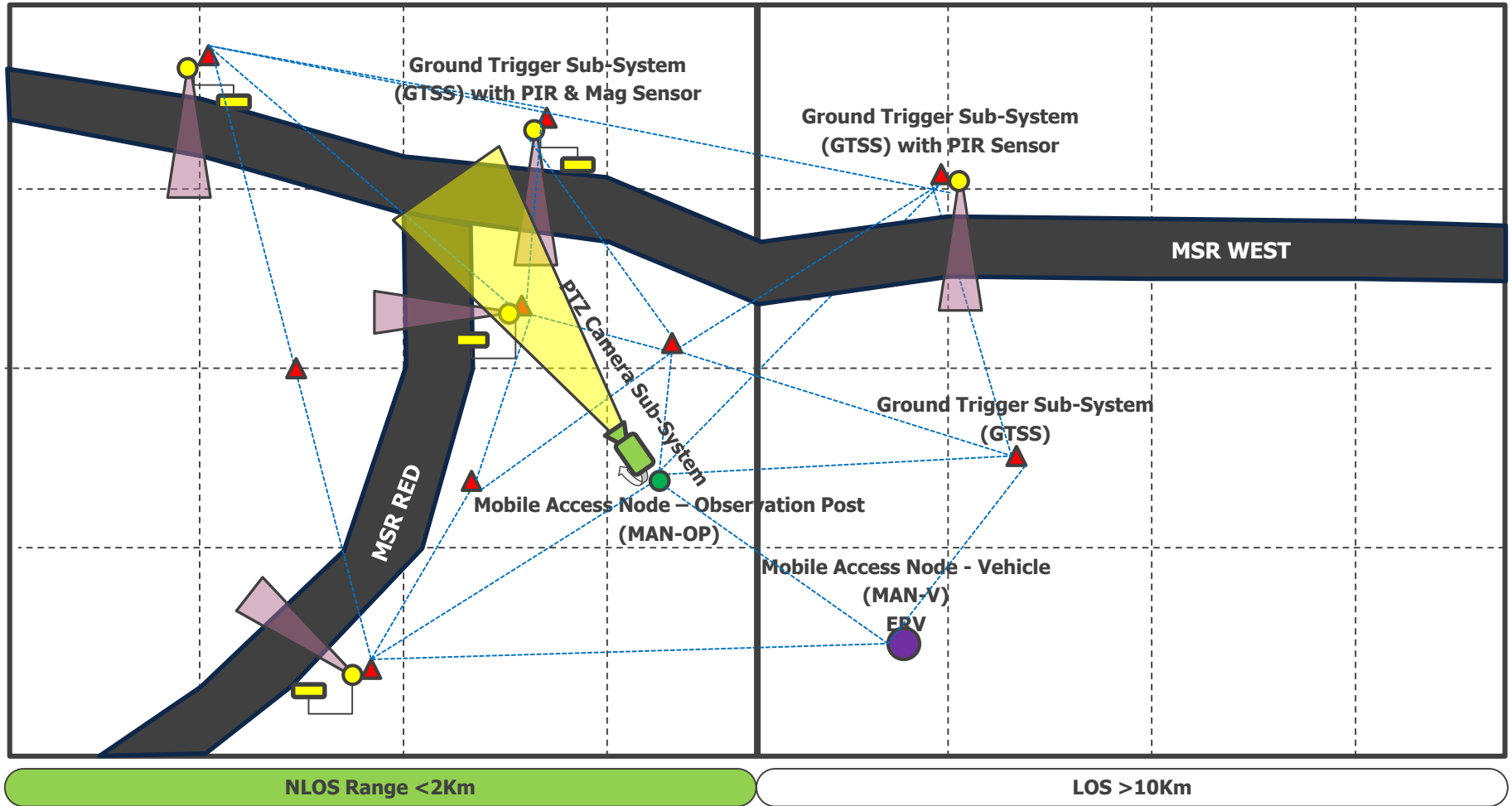
Force Protection Scenario



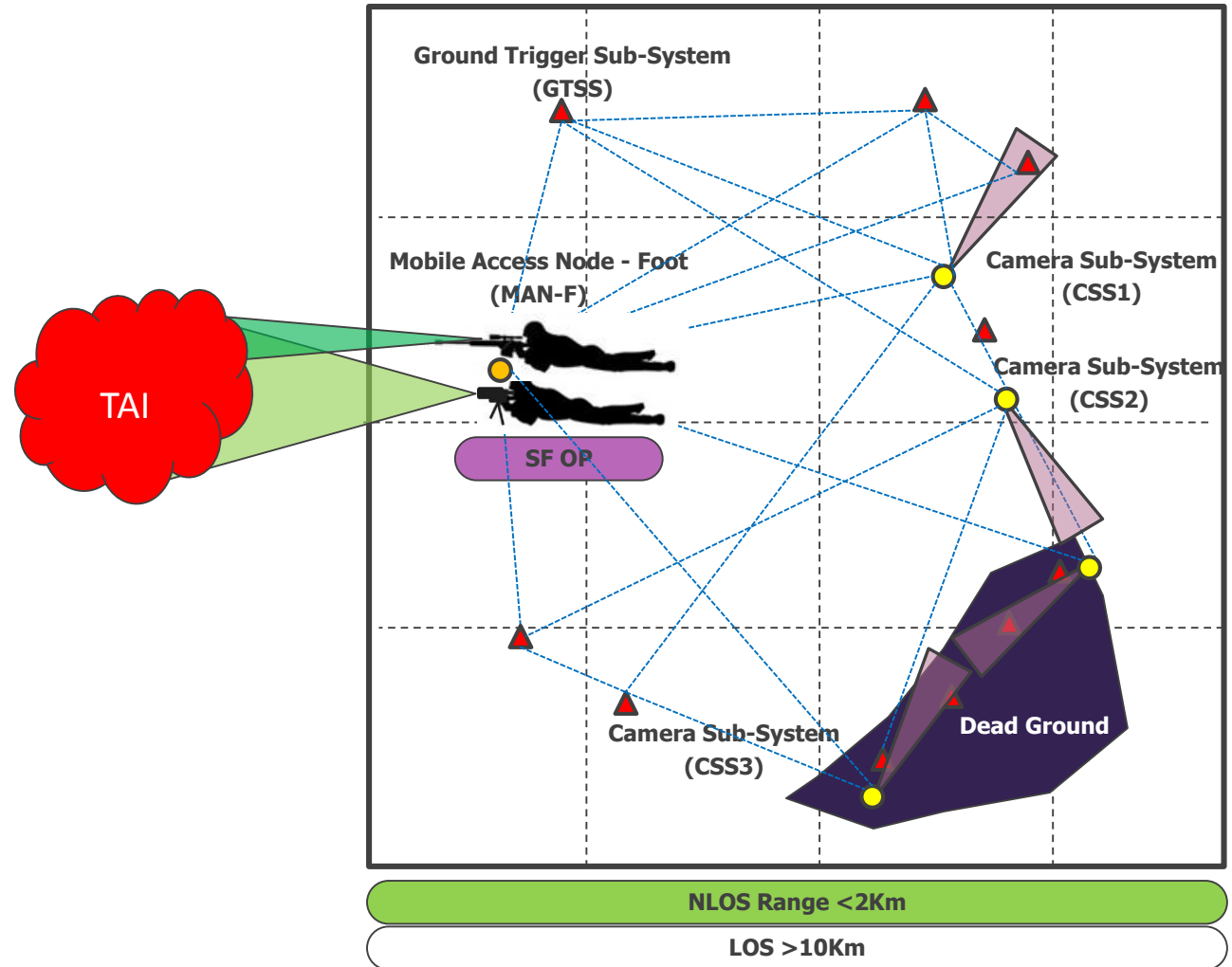
Target Area of Interest (TAI) Close Observation Surveillance



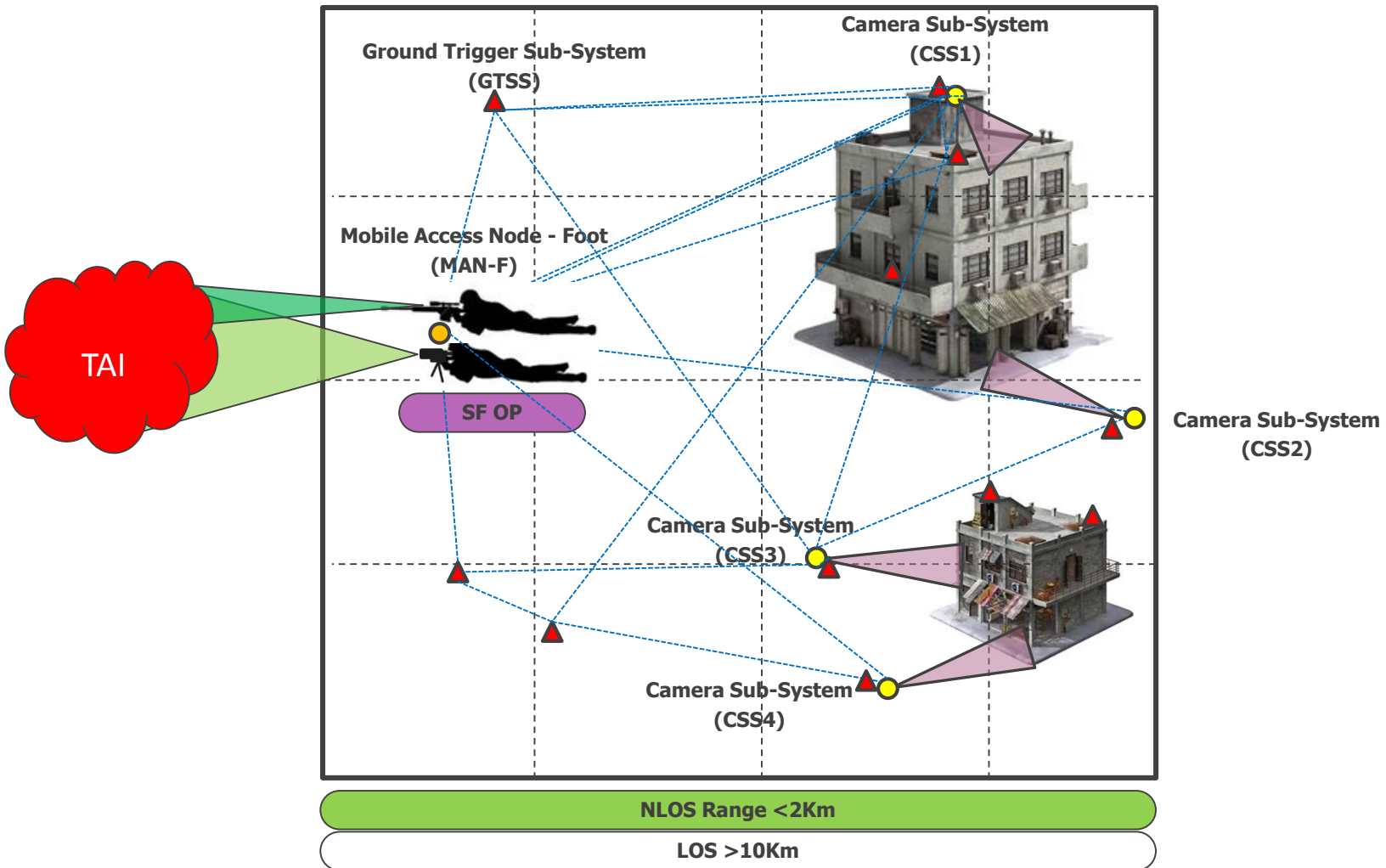
Main Supply Route (MSR) Close Observation Surveillance



Sniper Team Rear Protection



Sniper Team Rear Protection



VIP or HVT Deployment

Number of Sensors = 16 On Channel A or B

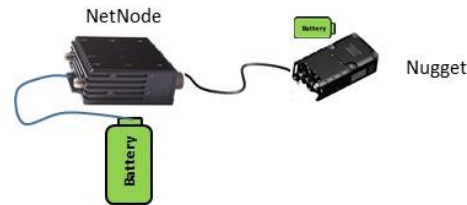


Summary

- DTC are a global trusted partner providing military and government agencies with world class equipment delivering capability in the fields of ISR.
- DTC solution delivers the following benefits:
 - Low technical and program delivery risk
 - An innovative, modular, self-healing, self-forming IP network infrastructure and open architecture solution
 - Proven state of the art secure Non Line of Sight (NLOS) and Line of Sight (LOS) communications solution
 - Commercial and Military Off the Shelf (COTS/MOTS) equipment to leverage in-service capability
 - Remote Configuration
 - Operationally-Proven Technology
 - Secure Digital Transmission
 - FIPS Approved
 - Robust Network
 - Spectrum Efficient
 - Modular, Scalable & Open Architecture
 - Rebroadcast Solution
 - RF Range LOS:
 - SAN: >9 km (dependent upon the height of the receive antenna).
 - MAN-V: >9 km (dependent upon the height of the receive antenna).
 - MAN-F: >5 km (dependent upon the height of the receive antenna).
 - Extremely low latency encrypted transmission data enabling FMV and stills.
- Delivered by a strong multi-capability team with extensive experience of working with Special Forces, Law Enforcement & National Security organisations responding and successfully delivering Urgent Operational Requirements (UORs) to similar organisations



Demonstration Layout



HQ Building NO RF Transmissions



Unmanned Ground Sensors

PMMI P-ISR Sensor Demo

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Video, IP
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Broadcast



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C2 Software
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