



Sultanate of Oman
Ministry of Defence
National Survey Authority

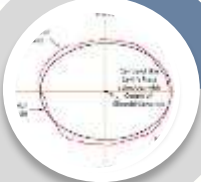
MOBILE MAPPING SYSTEM (MMS) & UNMANNED AIRCRAFT SYSTEM (UAS) FOR SULTANATE OF OMAN

Bibhudatta Swain
Geomatics Analyst



**Sultanate of Oman
Ministry of Defence
National Survey Authority**

**CURRENT
INITIATIVES
BY NSA**



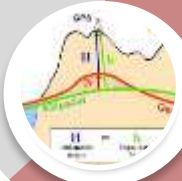
**Oman National Geodetic Datum
(ONGD-17)**

Local coordinate system for the Sultanate



**Oman National CORS Network
(OMANCORSNET)**

To provide real-time positioning System in the Sultanate



**Oman National Geoid Model
(OMANGEOID))**

A height modernization program to determine the accurate optometric height



**Oman Geospatial Manual
(OGM)**

To enforce standards for Geospatial activities in the Sultanate



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FUTURE INITIATIVES BY NSA

Satellite Receiving Station

Access to direct download
Satellite Images from Remote
Sensing Satellite

Mobile Mapping System

Collection of Geospatial
information from a mobile
vehicle using MMS Technology.

NSA GeoPortal

Development for National
GeoPortal for product catalog
and Routing Services etc.



Large Scale Mapping

Create and update large-scale
mapping including 5k and other

Unmanned Aircraft System

Collection of Aerial information
like LiDAR, DEM, OrthoPhoto
using UAV



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MOBILE MAPPING SYSTEM (MMS)

GNSS/GPS

Camera System
360-deg Coverage

Roof Mounting
System fits in one case

Laser, LiDAR, Radar Scanner
2D Profiler or 3D HDS

Industrial Computer
Dedicated hardware

Power Supply
One cable connection





MMS WORKING METHODOLOGY



FIELD APPLICATION

- Route Planning
- Sensor Setting
- Data Collection



OFFICE APPLICATION

- Field Data Importing
- Trajectory Calculation
- Map Adjust
- Panoramic Image Generation
- Point Cloud Generation
- Data Exporting



DATA PROCESSING

- GIS Data Collection
- Data Analysis



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MMS MOUNTING BASE



WATER



LAND



RAIL



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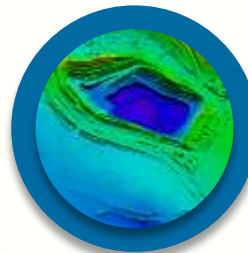
MMS BENEFITS



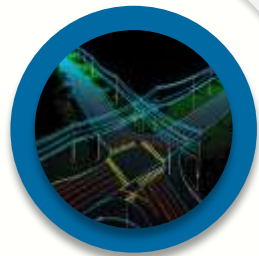
TOPOGRAPHICAL
SURVEYING



OPEN PIT MINE
SURVEYING



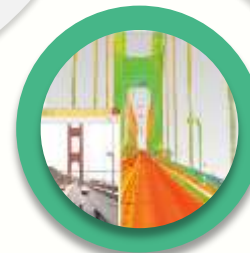
UNDERGROUND INSTALLATION
MANAGEMENT



ASSET MANAGEMENT
& ASSESSMENT



CONSTRUCTION
MONITORING



ROAD FACILITY
MANAGEMENT



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UNMANNED AIRCRAFT SYSTEM (UAS)





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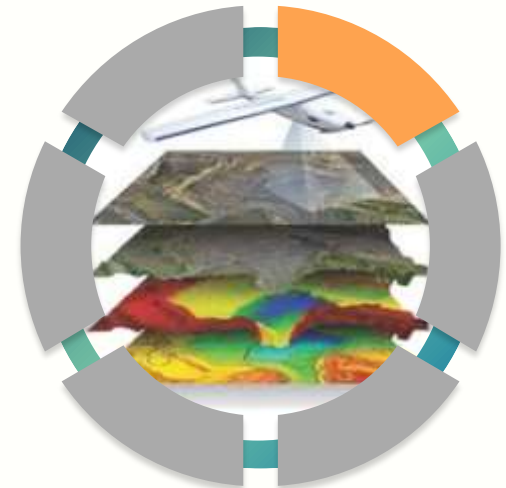
UAS WORKING METHODOLOGY



FLIGHT PLANNING



DATA AQUISION



DATA PROCESSING



UAS CLASSIFICATION

FIXED WING

For Mapping Large Areas

Wind speeds 40-45 mph

Only for Outdoor use

Flight duration 40-50 min

Need a Launcher for Take off and Landing

DEM, Orthophoto, Point Clouds, LiDAR data

ROTARY WING

For Mapping Small Areas

Wind speeds 20-30 mph

Indoor & Outdoor

Flight duration 15-20 min

Launcher is not required for takeoff & Landing

Inspection., Surveillance, Aerial Photo, Videos





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UAS BENEFITS



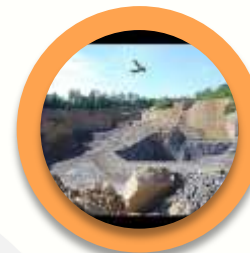
EMERGENCY



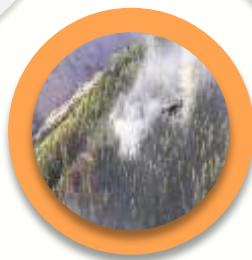
ASSET INSPECTION



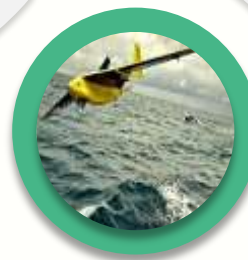
HIGH PRECISION
AERIAL PHOTO



SEARCH & RESCUE



ENVIRONMENT
CHALLENGING
AREA



SECURITY MONITOR



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MMS & UAS BENEFICIARIES

Regional
Municipalities, Water
Resources/ Muscat
Municipality & Other
Municipalities

Ministry of Defence

National Centre for
Statistics &
Information (NCSI)

Ministry of Transport
& Communication

Public Authority of
Mining

Ministry of
Environment

Royal Oman Police

Supreme Council for
Planning (SCP)

Ministry of Housing

Ministry of Oil & Gas

Ministry of
Agriculture &
Fisheries

Many more



WHY NSA?

CAPABILITY

- Pioneer in Surveying
- Expertise in 3D Data capture & Mapping, DEM & OrthoPhoto generation
- Good understating of Aerial photo, Image interpretation
- Custodian of photo Achieve
- Expertise in map production
- Training & Resource Development

INITIATIVE

- Oman National CORS Network (OMANCORSNET)
- Oman National Geoid Model (OMANGEOID)
- Oman National Geodetic Datum (ONGD17)
- Mapping 50K/100K Map
- Oman Geospatial Manual
- Oman Road Atlas

COOPERATION

- Good relationship with other stake holders in the Sultanate
- Part of various technical committees like UN-GGIM, UN-GEGN etc.
- Represent Oman Internationally
- Supports other ministries in Geospatial Activities like ONSS
- Strategic Partner for NSDI





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THANK YOU

**National Survey Authority,
Ministry of Defence,
Bait Al Falaj, P.O. Box 113,
Muscat, P. C. 100,
Sultanate of Oman**
Tel 968-24312164 · Fax 968-24312443 ·
Email: nsaom@omantel.net.om ·
Website: www.nsaom.org.om