Remote Surveillance with redundancy using Unmanned Vehicles

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Executive Summary

- **Remote Surveillance**
- **Redundancy**
- **Unmanned Vehicles (UV)**
- **Current Remote Monitoring Systems**
- **UV Specifics**
- **Applications**
- **UV System Example**
- **UVS Integration Advantages**

Remote Surveillance

- **Follow the state of a process or system**
- **State described by variables**
- **Variables are measurements**
- **Generate events/notifications from measurements**
- **Monitor the events/notifications from a remote location**

Redundancy

- **on Vehicle level**
  - perception, communication etc.
- **on Monitoring System level**
  - Data Acquisition

Unmanned Vehicles

- **Land, air, sea**
- **Different sizes, ranges and degree of autonomy**
- **Communication between systems**
  - Military: JAUS & STANAG 4586
- **Increase:**
  - safety level
  - responsiveness
  - environment

Current Remote Monitoring Systems

- **Infrastructure**
- **SCADA**
- **Monitored remotely**
- **Decisions taken remotely**

UV Specifics

- **Localization**
- **Perception**
  - Process Data
- **Where should the Data Processing take place**
  - on-board
  - in the cloud

Applications

- **Perimeter Security**
- **Pipeline Surveillance**
- **Underground Surveying**

1. Perimeter Security

Current:

Cameras

IR Barriers

Problem:

Countermeasures for perimeter breach

2. Pipeline Surveillance

Current:

SCADA – measure flow, vibration etc.

Problem:

Late detection

3. Underground Surveying

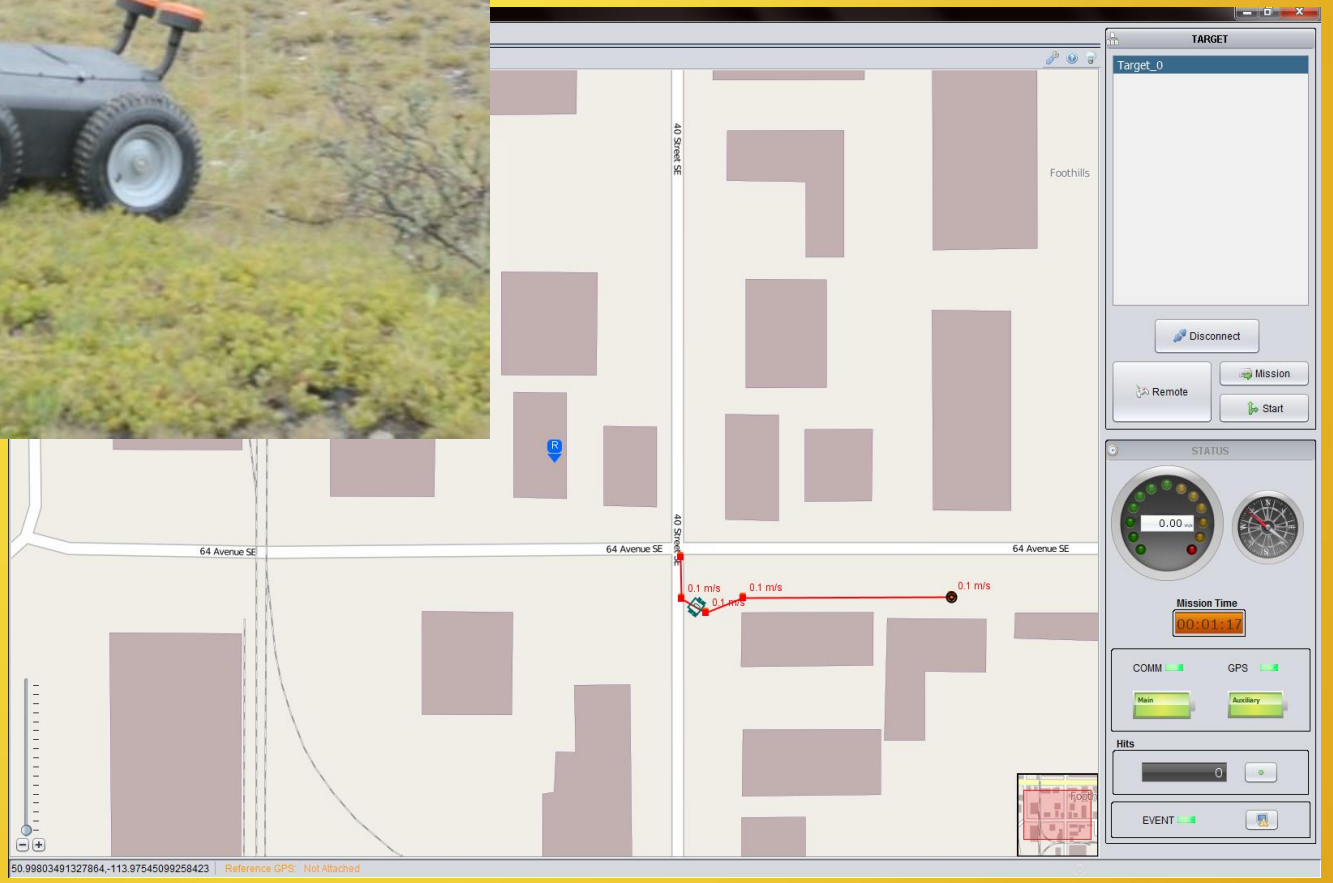
Current:

Static setup

Problem:

Slow rate

UV System Example



UVS Integration Advantages

- **Adaptability to changes in environment**
- **No infrastructure necessary**
- **Controlled level of autonomous decision making**

Questions?

Thank you!