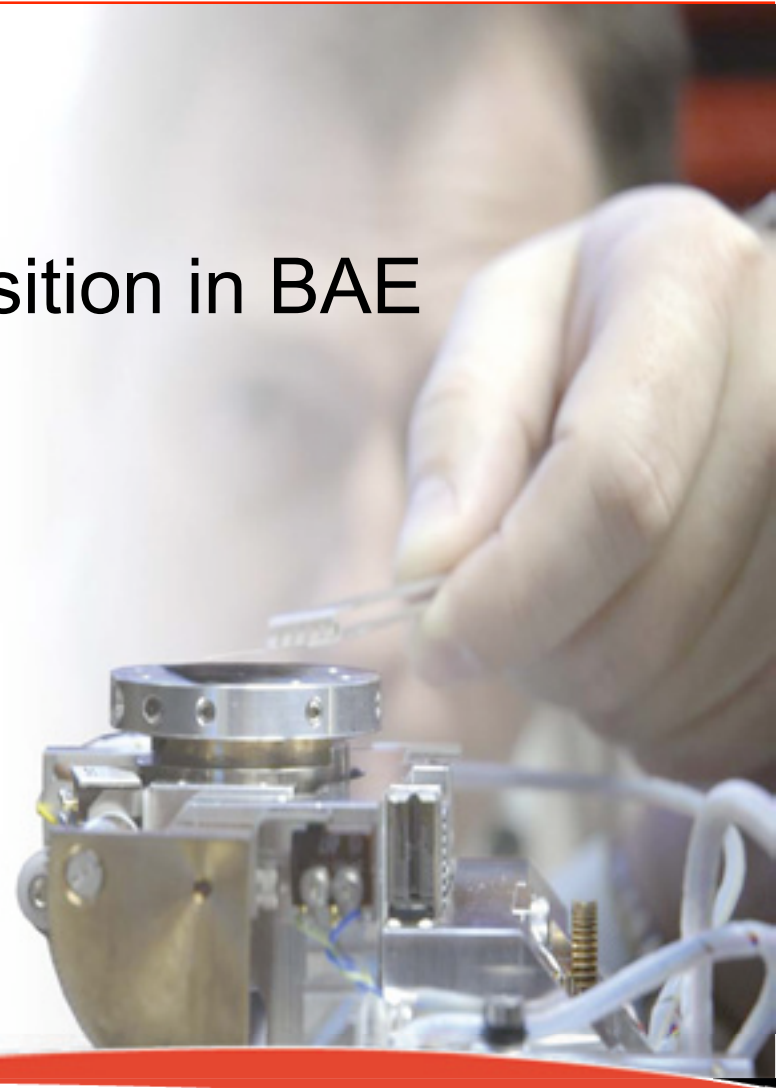


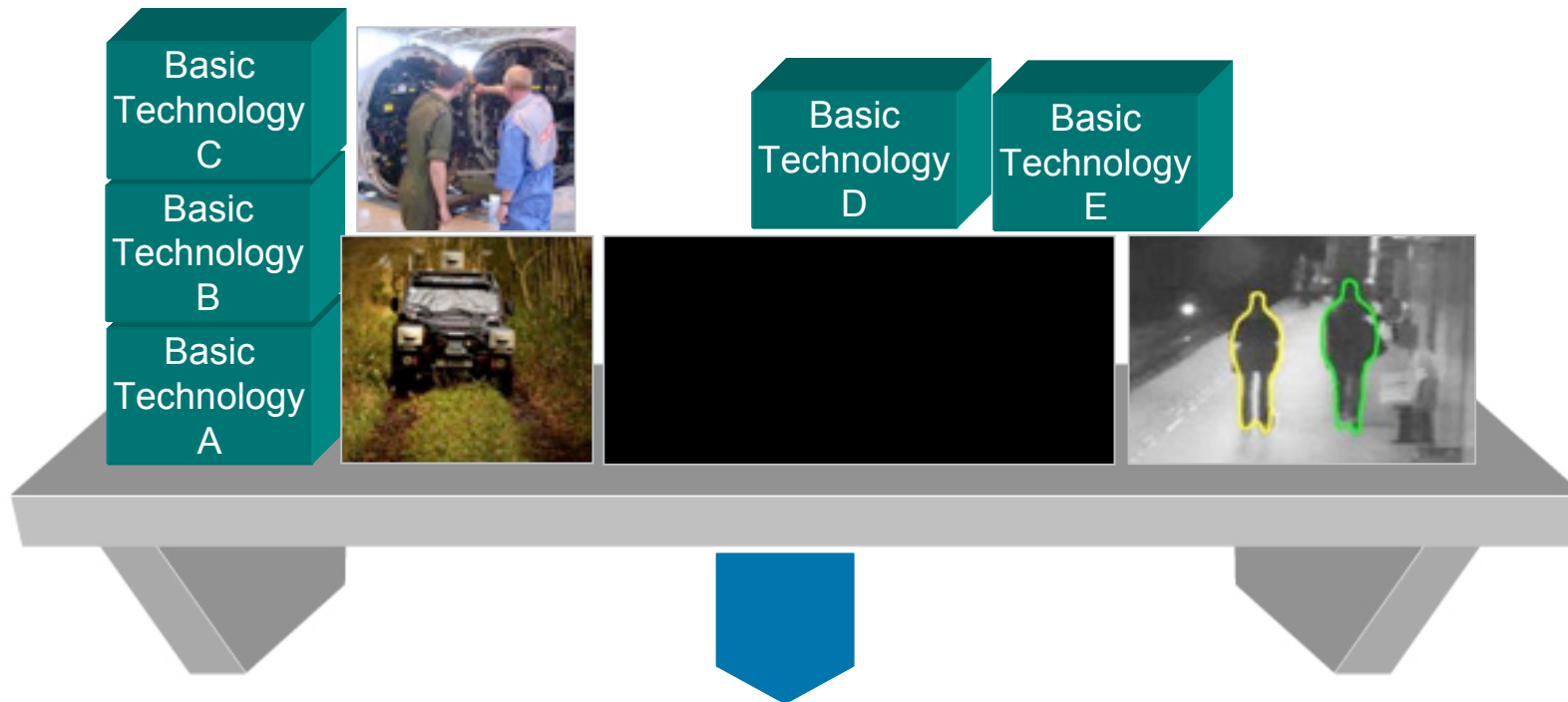
# Innovation in Technology Acquisition in BAE Systems

Phil Woods

Chief Technologist, BAE Systems  
Technology and Engineering Services



# The Technology Shelf



## Stocking the Technology Shelf

### **Project FLAVIIR**

- Low cost novel UAV
- Example of University based programme

### **Project Consequence**

- Data security
- Example of standard collaborative programme

### **Surveillance data analysis test bed**

- Anti terrorism and information systems
- Example of research partnering

### **Project “Sandbox”**

- Open innovation facility in autonomy



# Project FLAVIIR

---

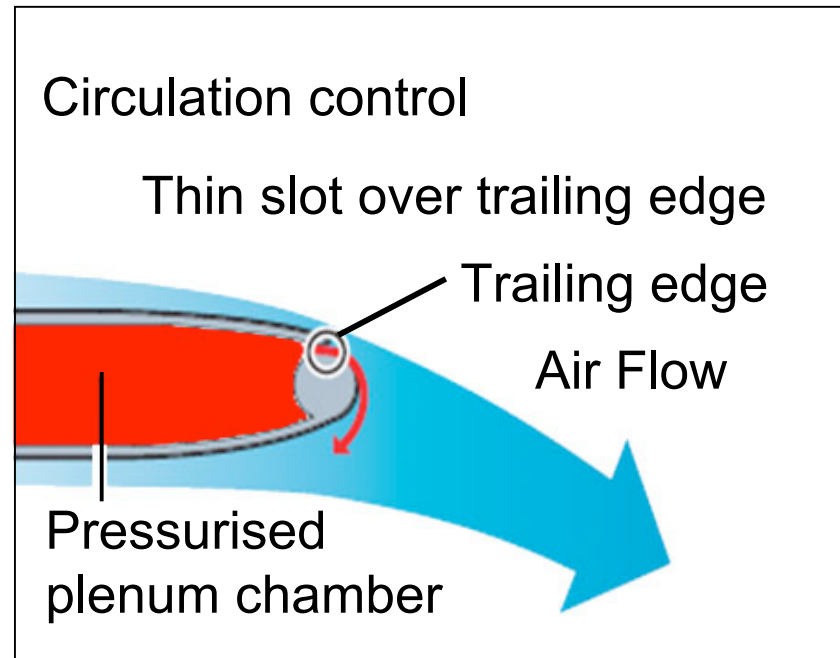
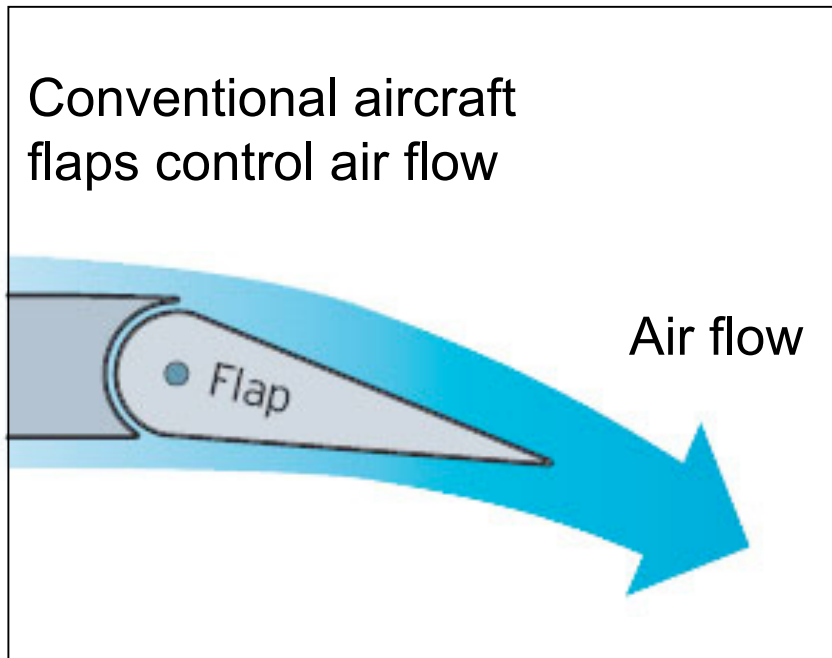
- Driven by a single challenge:  
“A low cost, maintenance free UAV without conventional control surfaces”
- BAE Systems & EPSRC sponsored
- Long term - 5 year duration
- 10 Universities
- Novel in that
  - It asked Universities to work together
  - Considered integration and demonstration a key element

Cranfield  
UNIVERSITYImperial College  
LondonUniversity of  
LeicesterUNIVERSITY OF  
LIVERPOOLMANCHESTER  
1824  
The University of ManchesterThe University of  
NottinghamSwansea University  
Prifysgol AbertaweUniversity  
of SouthamptonTHE UNIVERSITY OF  
WARWICKTHE UNIVERSITY of York

# Project FLAVIIR – What is in it?

The image illustrates the Project FLAVIIR experimental setup and its multidisciplinary integration. The top-left photograph shows the physical hardware, including the Titan jet engine, jet pipe, and FTV nozzle, mounted on a 6-component balance. The top-right photograph shows a computer workstation used for data acquisition and simulation. The bottom-left photograph shows a metal grate structure, likely part of the engine's inlet or nozzle. The bottom-right photograph is a colorful aerodynamic simulation showing flow patterns. The central circular diagram highlights the integration of various disciplines: Aerodynamics, Electro-magnetics, Numerical Simulation, Control Systems, Materials & Structures, and Manufacturing, all feeding into the central 'Integration & Demonstration' phase.

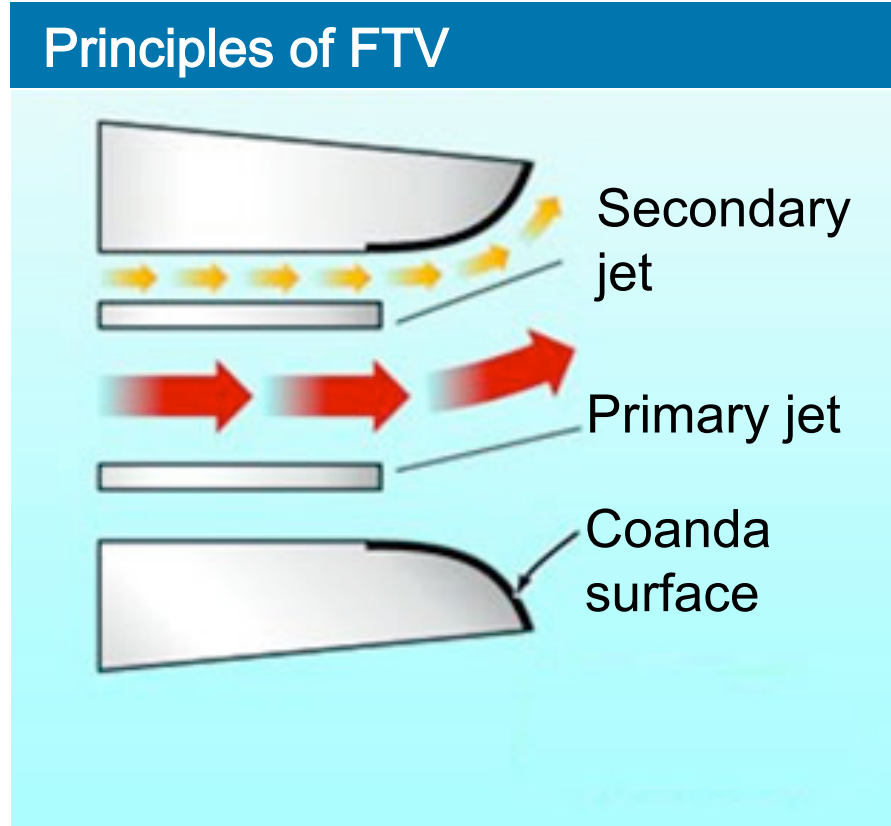
# Project FLAVIIR – Flapless control example



*Pictures courtesy of the Daily Telegraph*



# Project FLAVIIR – Flapless control example



Picture courtesy of the Daily Telegraph



## Project FLAVIIR – The demonstration approach

---



Overcoming engineering and integration problems  
enabling agility for the future

A red decorative graphic consisting of a thick, curved line that tapers from left to right, positioned at the bottom of the slide.

# Project Consequence

---

- An EU funded project involving
  - Partners: BAE Systems, Microsoft, HP, Imperial College, CNR, CREATE-NET
- Project aim
  - Produce a data centric information protection framework
- Problem context
  - How to share appropriate information at the right time in the right place



# Project Consequence

- During a major disaster recovery
  - Access to data is required by certain rescue personnel to aid operation
  - Sensitive information (commercial or public safety) needs to be handled correctly
  - Data needs to be limited to prevent overloading

Negotiate  
data sharing  
agreement

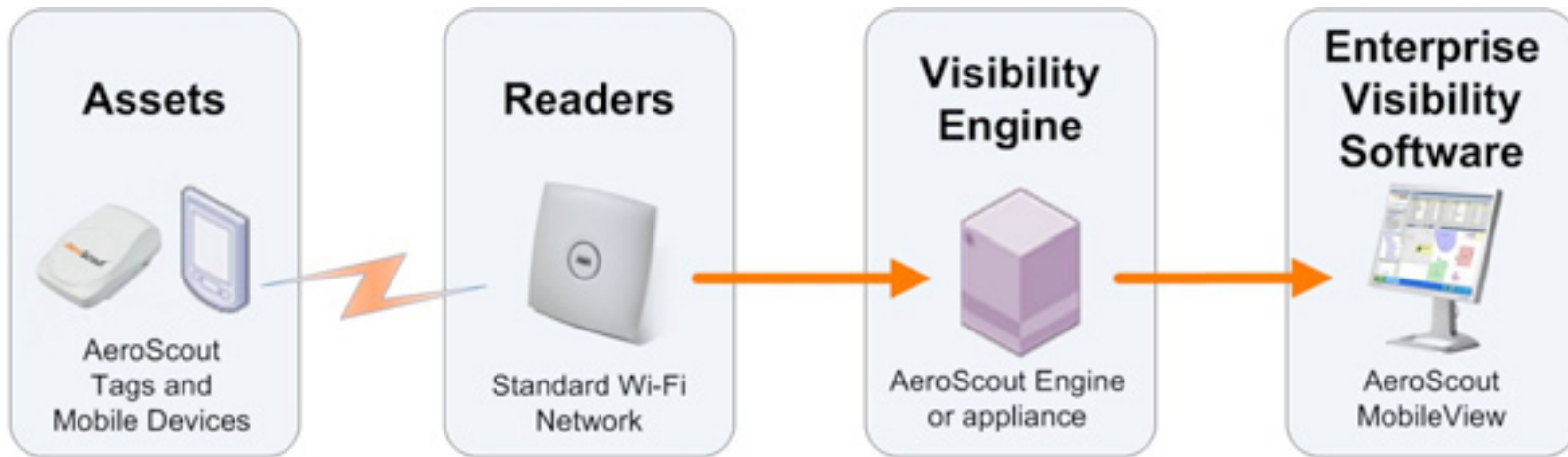
Translate agreements  
into policies and  
machine rules

Deploy policies  
to systems and  
applications

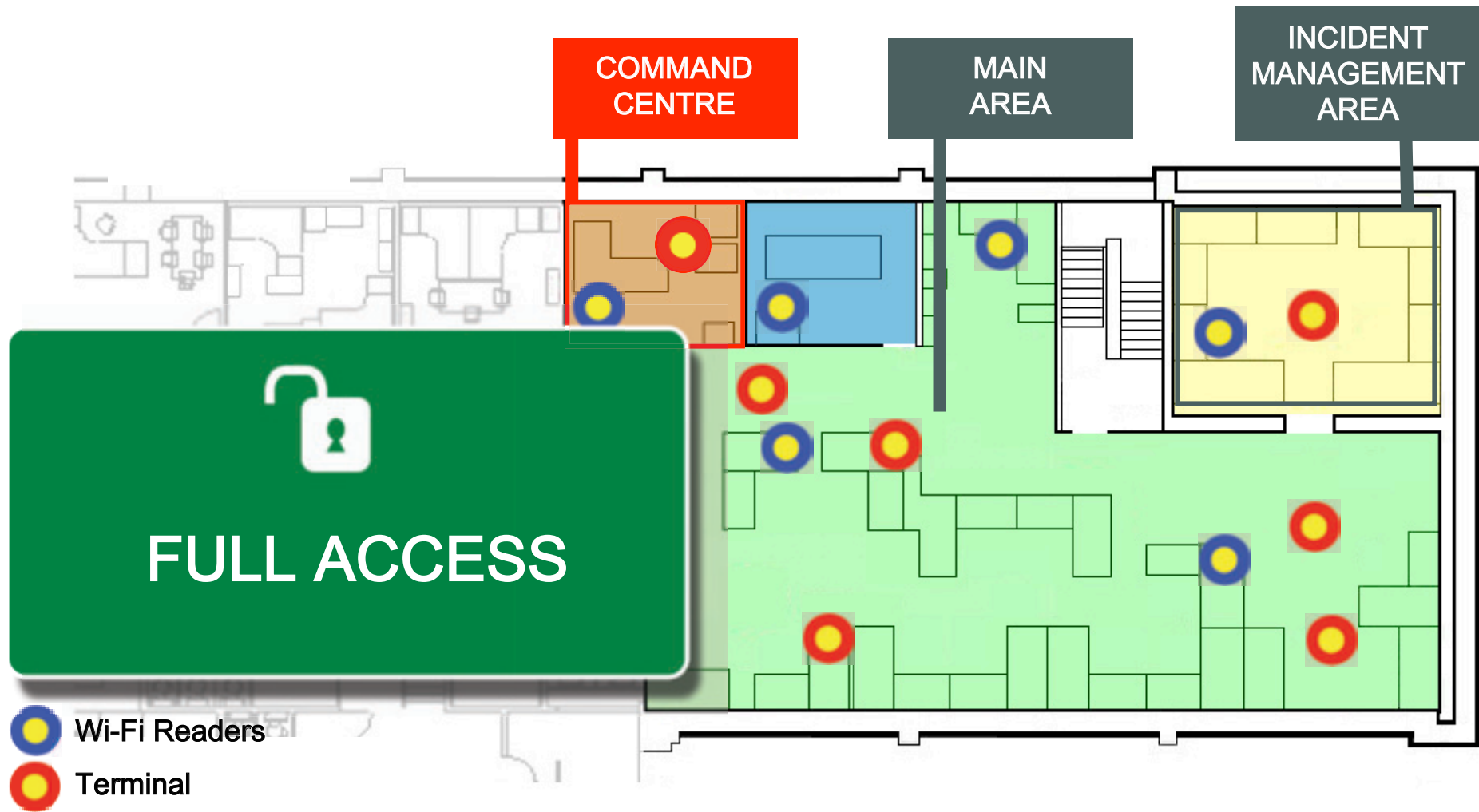


# Project Consequence - Localisation

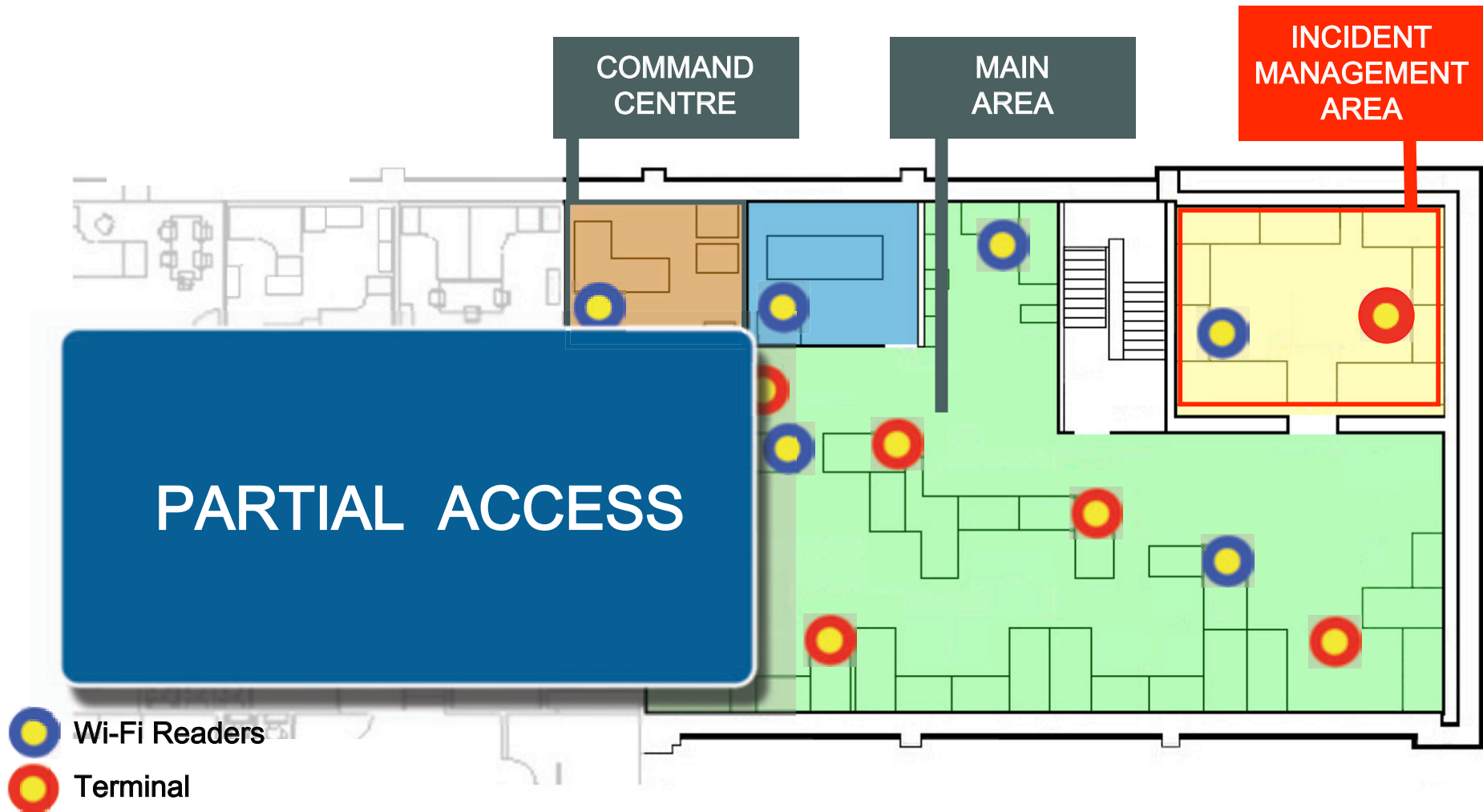
---



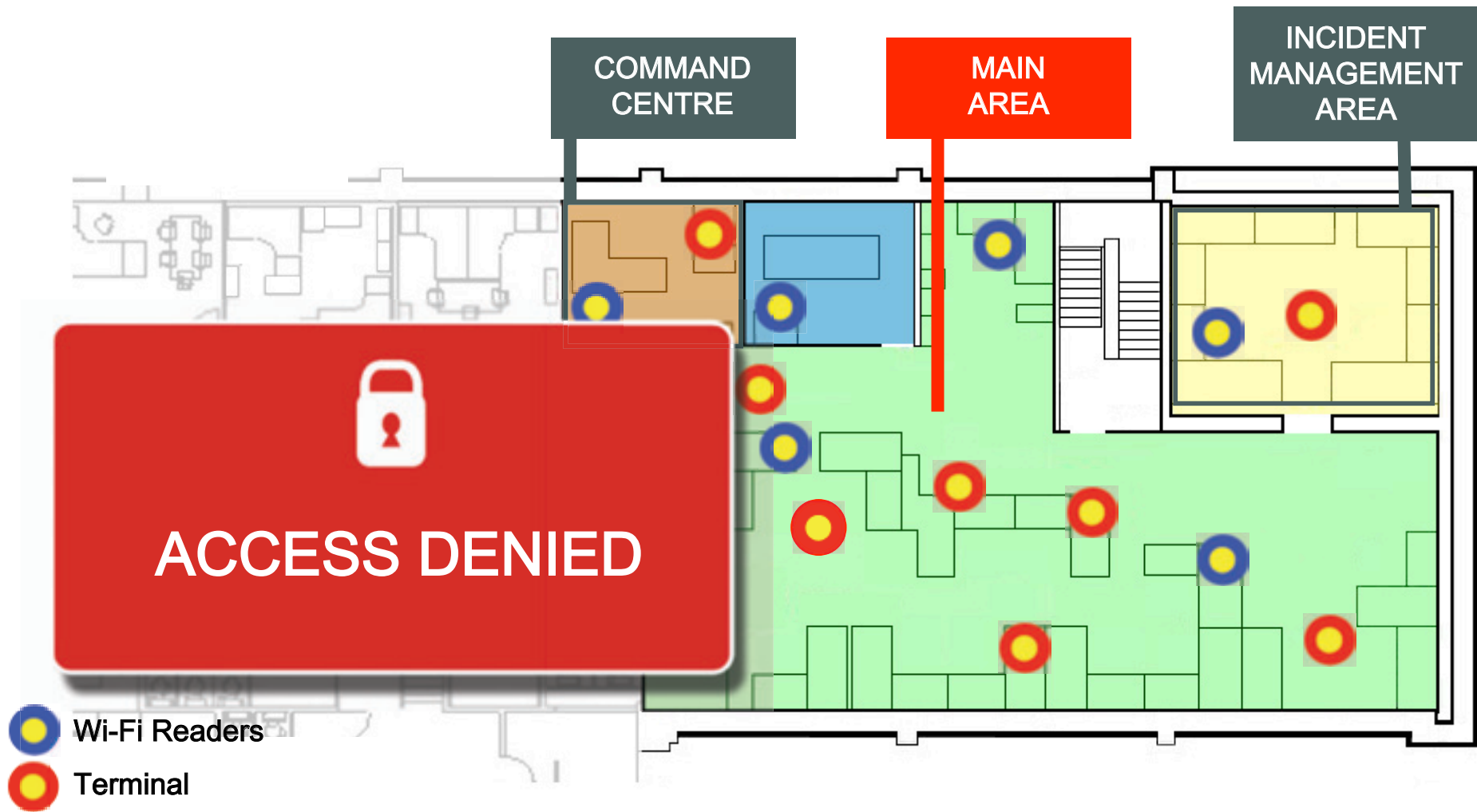
# Project Consequence – Data Access



# Project Consequence – Data Access



# Project Consequence – Data Access



# Surveillance Data Analysis Testbed



# Surveillance Data Analysis Testbed – who is involved?



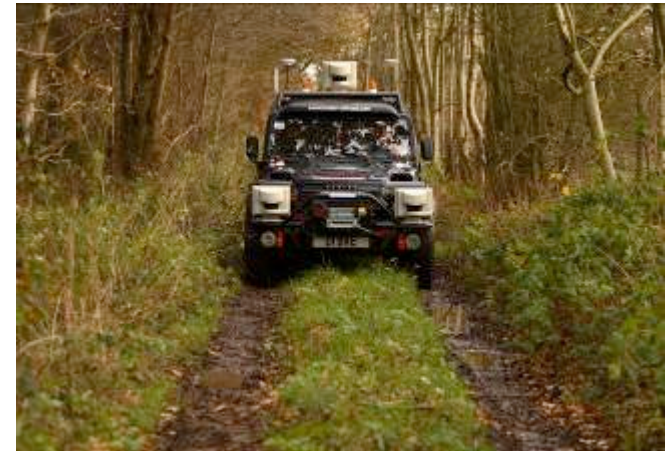
## An Interesting Problem – tracking in crowds

- Key issues in tracking in crowded spaces
  - Noise and clutter
  - Uneven image illumination
  - Target crossing and partial occlusion
- Example technologies
  - Self Adapting Discrimination Filter with Ipsotek tag and track



# 'Sandbox'

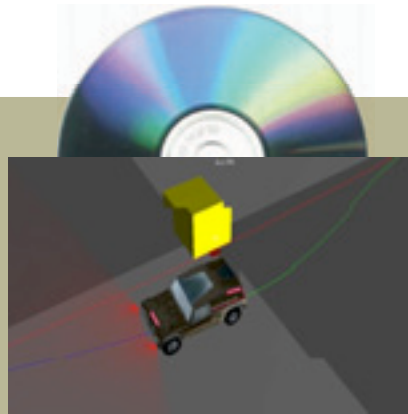
- 'Sandbox' open innovation facility
  - Provision of BAE Systems assets to 3<sup>rd</sup> parties to allow demonstration of capability in representative environments
- BAE Systems gets:
  - Results of evaluation of new ideas
  - People developing products which will quickly integrate into BAE Systems products
- Third parties get:
  - Ability to develop for BAE Systems market with realistic hardware/software
  - IP controlled environment
  - Access to hardware and software, potentially expensive to re-develop
- Open to anyone with a well developed idea
  - Large companies, small companies, academia...



# What is in the 'Sandbox'



Support



Simulator  
on a CD



Pioneer in a box




Open Wildcat

**External Company**

## Summary

---

- Agile fast development into products is only possible with the right and *available* set of capabilities to pull through
    - There is a need to ensure the ‘shelves’ are **intelligently** stocked and **well understood**
  - There is no single research engagement model
    - We have considered standard collaboration, research partnering and open systems approaches
    - BAE Systems are always looking for innovative ways of engagement and technology pull through
- 

# Q&A

---

