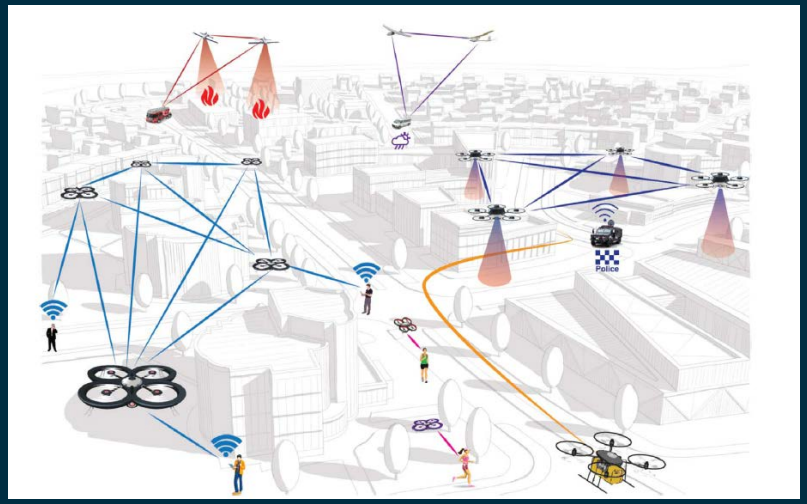
CASCADE

Secure Case Study



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CASCADE

- Accelerating the commercial exploitation of unmanned air systems

Agility – do it faster
Safety – do it safer
Capability – do it better
Autonomy – do it smarter
Scalability – do more

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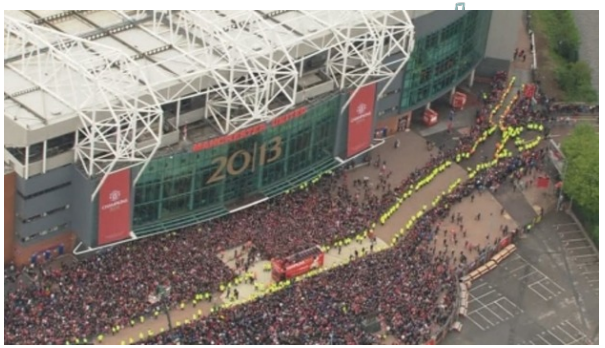

‘Secure’ case study scenario

- *Greater Manchester police drone unit are tasked with routine monitoring of a major football match at Old Trafford. At the same time a specialist surveillance unit are tracking movement of known persons of interest who are now heading towards the stadium through the city. Development and approval of a dynamic operational plan is required immediately to provide effective aerial intelligence on the evolving situation.*

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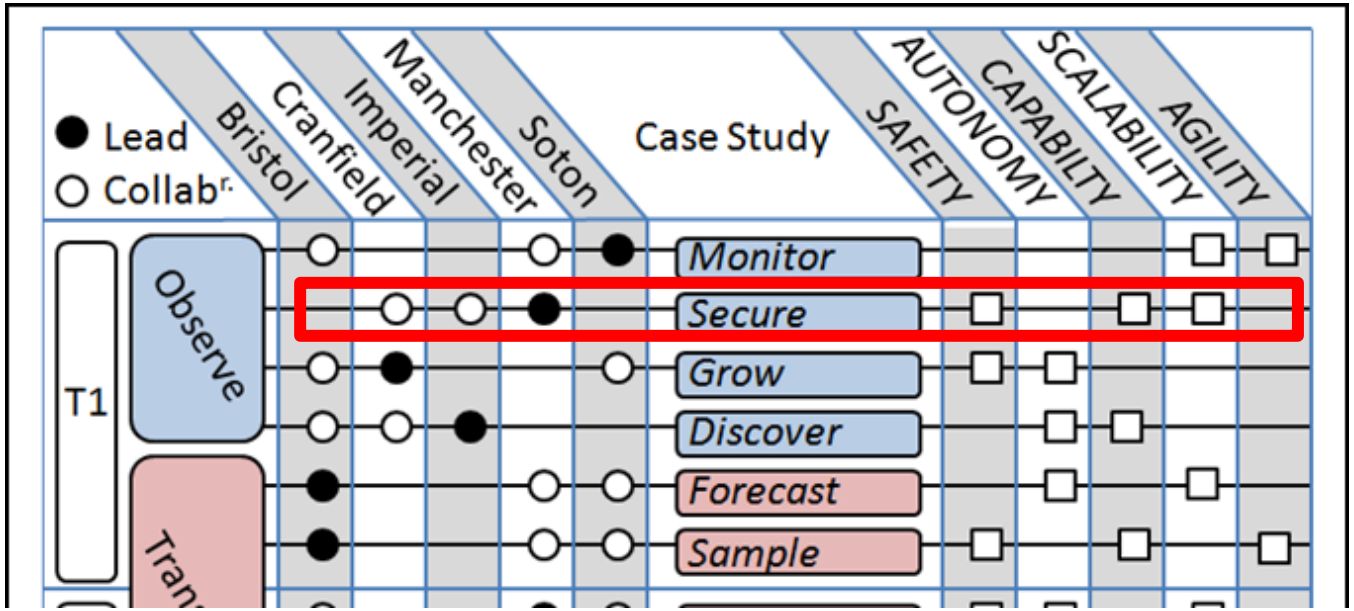
Research opportunity

- The capability of available drone vehicle technology far outstrips the ability of civil law enforcement to use it as currently constrained by legal guidelines (CAA) and organisational approach to risk
- An opportunity exists to unlock this capability through development of smarter mission management tools that dynamically automate planning, risk assessment and safety case generation for security applications

Case study industry partners

- 'TITAN' tactical surveillance unit
  - Team of ~10 police officers dedicated to covert surveillance operations in the NorthWest
  - Significant appetite to use drones as routine part of day to day operations.
  - Approved as drone operators but as yet not used them operationally
  - Significant challenge in providing evidence of adequate management of risk for new technologies
- Great Manchester/Lancashire police drone task force
  - New team recently tasked with introducing drones for routine police operations
  - Focus on reducing cost of police operations (send a drone rather than squad car to investigate a potential suspicious person)
  - Emphasis on deskilling operations such that minimum of specialist training is required

Case study academic partners



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Relations to CASCADE themes

- Scalability
  - Solutions need to be scalable to widespread roll out to police/security forces across the UK
  - Need to minimise growth in cost and complexity with scale
- Safety
  - Key barrier to exploitation
  - Many useful applications are not possible due to unaffordable cost of safety
- Capability
  - Advanced capability e.g. perch and stare, is of value but is a secondary driver

Research method

Method	Simulation	Mixed Reality	Field Trials
Advantage	Mathematical rigour	Flexibility	Industrial relevance
Output	Engineering science	Human factors	Operational science

Management

- Case study will be led by the UoM PhD student (Ethan)
  - Focus will be on development of new operational science
  - Access to engineering science and know how in wider robotics group

- Scalability research and links with other CASCADE partners will be led by the UoM PDRA (Tom)

SWOT analysis

- Strengths
  - Applied case study with clear end user need
  - Good skill base in house to support underlying engineering science (path planning in complex environments)
- Weaknesses
  - Operational science could be considered too fuzzy for engineering research
  - We are not experts on human factors or practical operations research methods
- Opportunities
  - Good opportunity for planning and risk assesment module to feed in to other case studies
- Threats
  - Potential competition with commercial developers in this space. Need to project one or more generation beyond current systems