Emerging Commercial UAS Operational Environments and NASA’s Role

NASA’s UAS Integration in the NAS (UAS-NAS) Project is conducting research in the areas of Detect and Avoid (DAA), Human Systems Integration (HSI), and Communications to support reducing the barriers to routine UAS access to the NAS.

IFR – like Operations
UAS will be expected to meet certification standards and operate safely with traditional air traffic and ATM services. (Example Use Case: Communication Relay / Cargo Transport)

The Ikhana UAS (left) performing an “encounter” against cooperative, manned traffic using a NASA Detect and Avoid (DAA) system.

The UAS-NAS project used Ikhana to help inform the Phase 1 MOPS (red outline), with flight tests conducted in 2015 and 2016. The next phase of flight test, scheduled for Summer 2018, will use a smaller UAS to research and develop minimum DAA and sensor performance standards to enable additional UAS operations in the NAS.

Tweeners
These UAS will operate at altitudes below critical NAS infrastructure and will need to routinely integrate with both cooperative and non-cooperative aircraft. (Example Use Case: Infrastructure Surveillance)

Low-Altitude Populated
Must interface with dense controlled air traffic environments as well as operate safely amongst the traffic in uncontrolled airspace. (Example Use Case: Traffic Monitoring / Package Delivery)

Low-Altitude Unpopulated
Low risk BVLOS rural operations without aviation services. (Example Use Case: Agriculture)

Cooperative Traffic

Non-Cooperative Traffic

Minimum Enroute Altitude

Class E
60K’ MSL

Class A
Cooperative Traffic

18K’ MSL

Class E
10K’ MSL

Class E

Class B / C

Class G
700’ AGL

2500’ AGL

500’ AGL

1200’ AGL

Airport