Meeting of Experts
UAS Integration in the NAS
General

- Excited that NASA is addressing this issue
- Is effort addressing key issues.
- Should address civil UAS
- Small low capability UAS are important.
  - Be clear on intent regarding small UAS
- Address level of autonomy as it relates to communication assumptions
- Time frame 2015-2025
  - Research needs to keep pace with industry
- Review background docs
  - RTCA - OSED, Access 5, DO 304, 320, …
General

• Small UAS is only area with defined cert path
  – NASA input would be useful
  – Low hanging fruit, safety data to support FAA decisions (eg night ops)
• Message framing (tone)
  – Not just use of stimulus money, real problem defined
  – Clarify NASA role not driver (eg con-ops)
• Partnerships government focused, consider more industry involvement
  – FCC and NTSB as partners?
• Poor job on presenting background and assumptions
• Need to be more out of the box and dealing with future issues rather than existing capabilities
• Limited by current tool set
• Consider SATS experience
• Effort may be spread too thin
  – Prioritize and focus (eg 4 deliverables)
  – Involve community in prioritization
Con-Ops

- Need to leverage existing con-ops
- Multiple con-ops likely
- Need to be explicit on assumptions
  - Vehicle size, airspace, mission
- Is routine access defined
- Too deterministic
- Approach to systems analysis and con-ops integration, fuzzy, vague
- Not clear what the prioritization scheme is
- NASA is recovering from its dormant period
- Has RTCA OSED document been reviewed (don’t reinvent the wheel)
Separation Assurance and Collision Avoidance

- Separate separation assurance from non-nominal
- Non-nominal more useful
- Sep assurance good area but need to frame the research questions
  - Using the FAA, DOD frameworks
- Vague
- “No use doing what was being presented in separation assurance”
  - Need to come up to speed on DOD experience
- Unclear which vehicles are being considered
- Unclear assumptions, eg airspace
- Plan assumes a solution of another safety layer
  - Not clear that this is correct
- Terminology issues
  - Some elements have been done
- Review other efforts (eg Smart Skies)
Pilot Aircraft Interface

• Terminology (HSI?)
• In the loop vs on the loop
  – In the loop will be the exception in the future

• Didn’t discuss ATC controller interface
Communications

• Spectrum critical near term issue
  – WRC 12 (only command and control)
• Best use of spectrum bucket
• Think of out of the box approaches to bandwidth
  – Leverage space experience
• Consider NEXTGEN as default baseline
• System trades com vs level of autonomy
• Some of current planned deliverables already exist
Certification

• Should operational regulatory issues be out of scope?
• Inclusion of operational mitigations in cert process will be critical
• Support approach
  – Focus on automation
• 1309 approach good, SMS and other approaches are not discussed.
• What is the advantage of cert by application
• Definition of accident and incident for UAS
Integrated Test and Evaluation

• What are the driving requirements?
  – Making assumptions on vehicle mix, requirements, etc

• Test airspace access for university researchers