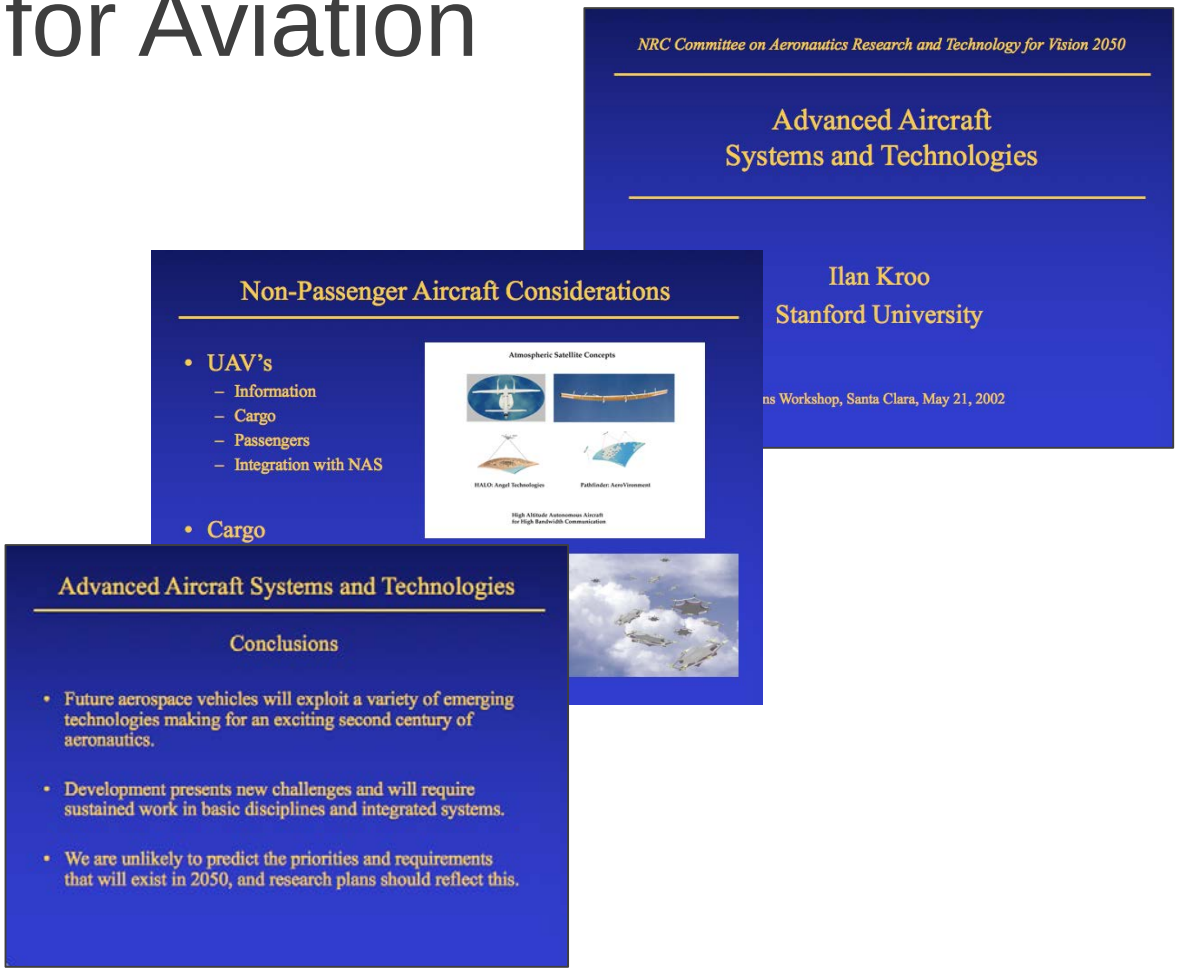
Session 4: Future Visions
New Directions for Aviation



Piloted Vehicle Autonomy

Autonomous Aircraft Older Than Stanley

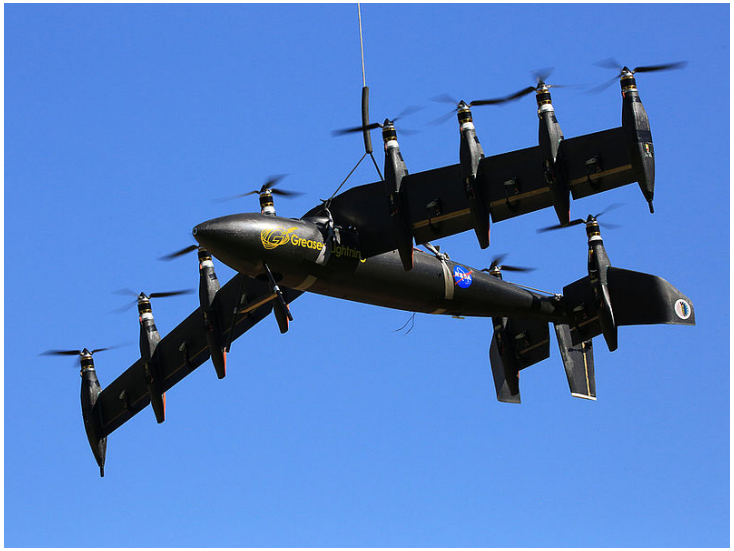
Why Autonomous Aircraft Now?

Autonomous delivery

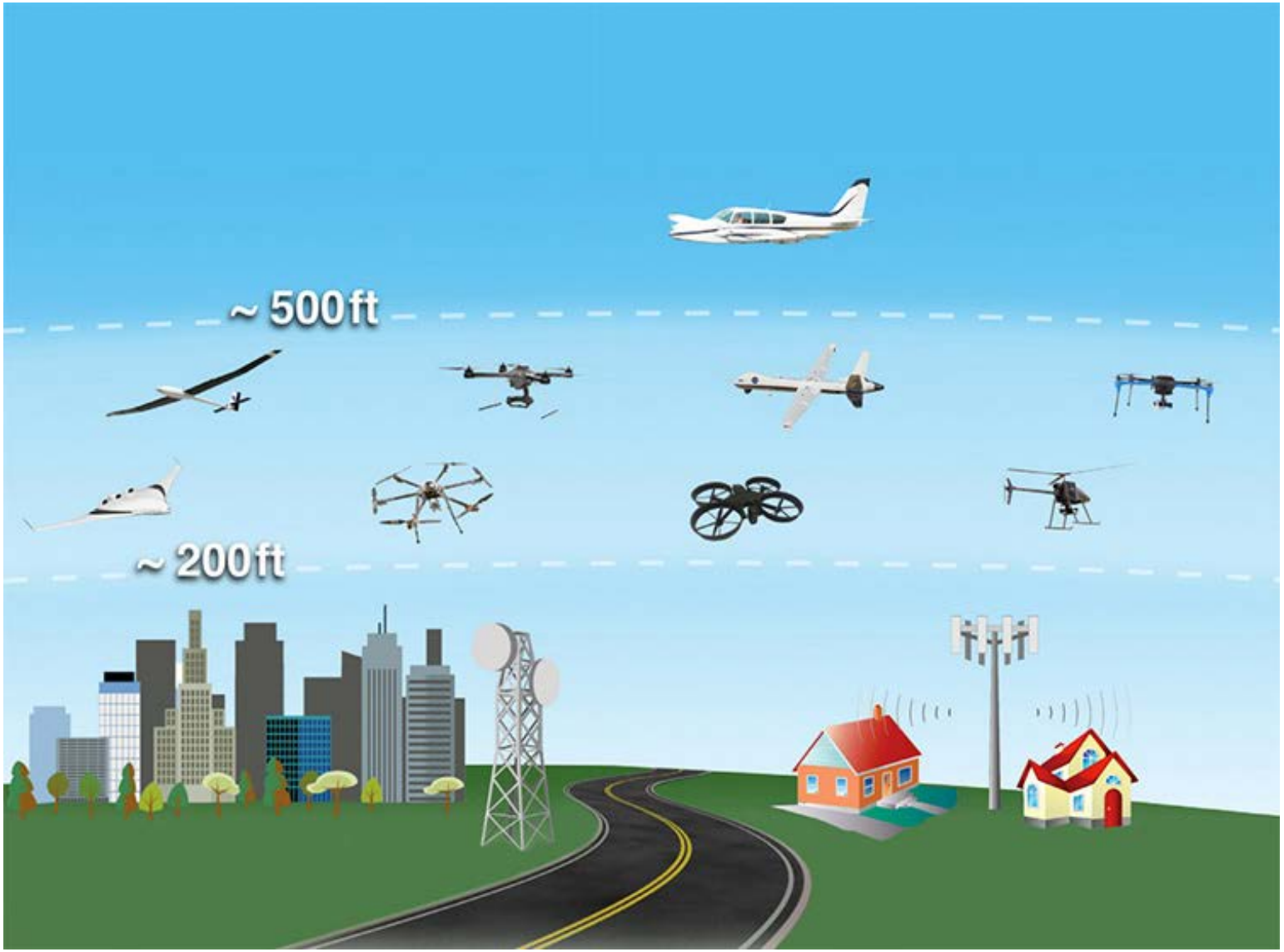
Personal mobility

Societal Needs	Urbanization, traffic, time, housing, environment, economics, communications, commercial funding
Regulatory Issues	Safety (ATM, airworthiness), noise, air quality, security, global climate, privacy
Technological Advances	Electric infrastructure, power systems, energy storage, simulation, sensors, precision nav, deep learning, structures tec

Autonomous Aircraft Evolution



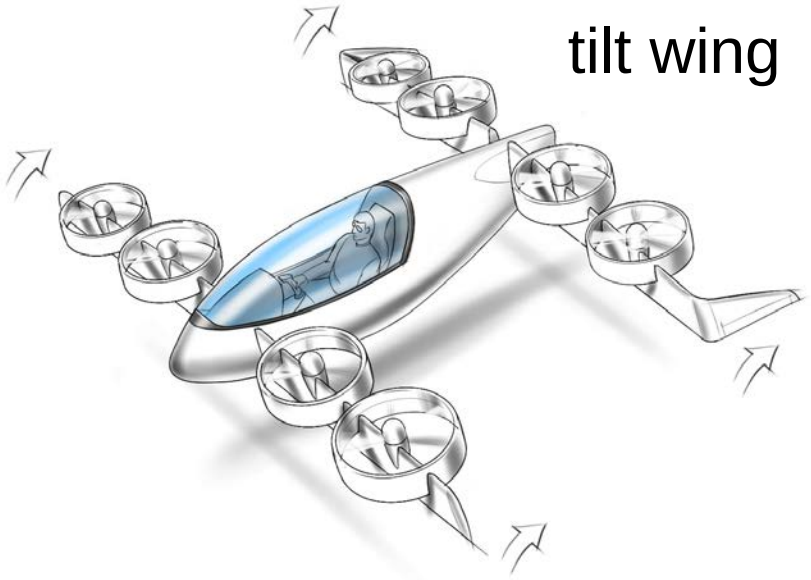
Multiple Vehicle Challenges to ATM/ATC/UTM



Personal Air Mobility

Puffin, NASA

Multi-rotor tilt wing



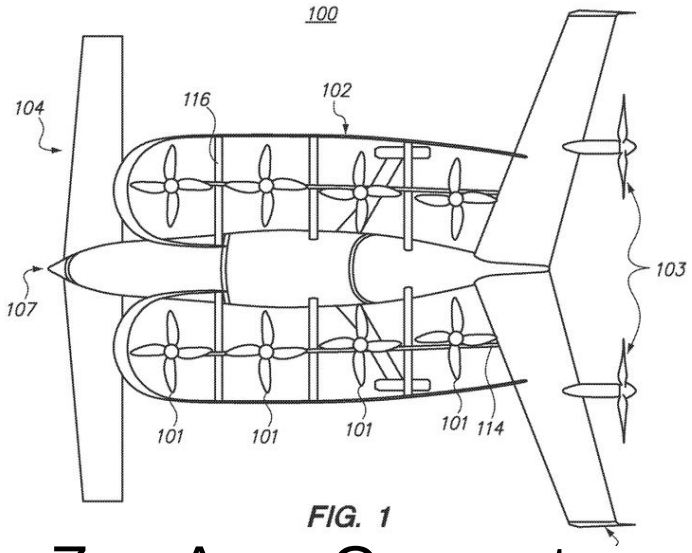


FIG. 1

Zee.Aero Concept

Zunum Hybrid

Questions and Issues

- How close is this vision of the future?
- What are the technical/regulatory/social barriers?
- What infrastructure is needed?
- How will flight vehicles interact with ground transport?
- Is the technology scalable to large payloads and high speeds?
- How might this form of air transport change society?
- What should we do now to make this happen?

Critical Technologies

- Vehicle autonomy and augmentation
- Revolutionary propulsion
- (Even more) safety critical software
- Machine learning and adaptive systems
- Aero modeling in more challenging domains
- Scalable structures and manufacturing
- Non-evolutionary design (flexible, fast, believable)
- Low cost avionics