Design Reference Missions (DRM):
Integrated ODM ‘Air-Taxi’ Mission Features

Structural Health / Energy Storage / Electric Components
Loss of Control / Degraded Systems / System Health
Real-Time I/O Operator & Geo-Fencing
Regional Noise Abatement
Trusted Autonomy
Inter-operability

Last 50 ft
Maintain Power Margins for VTOL

Entry/Exit Controlled Airspace
Autonomous Separation
Autonomous Flight Planning (Pick-up) (Drop-off)
Coexist with Package Delivery aircraft
ODM Pick-up point
ODM Drop-off point

Sense & Avoid System
Weather Detect & Avoid System

Power-Regeneration Range Extension

Sense & Avoid (Aircraft)

Local Noise Abatement

Contingency Management

Optional Emergency Landing Site

Regional Noise Abatement

https://ntrs.nasa.gov/search.jsp?R=20170006527 2020-02-06T22:33:39+00:00Z
https://ntrs.nasa.gov/search.jsp?R=20170006527 2020-02-06T22:33:39+00:00Z
Hybrid Electric Integrated System Testbed (HEIST) flight control

- Embedded Controllers & Distributed Intelligence
- Improved efficiency for each controller (i.e. Motor, Generator, Turbine Fuel, Batteries)
- Power Train Command & Control Loop
- Improved Efficiency for integrated Power-Train
- Aircraft / Flight Maneuver Command & Control Loop
  - Electric Motors Used as Control Effectors
  - Reduce Vertical Tail Size
  - Failure Recovery
- Mission / Operations Command & Control Loop
  - Peak Seeking Control
  - Optimal Flight Profile
  - Recharge Batteries
  - Extend Range

Enhanced Roll Control
Enhanced Yaw Control
Enhanced Pitch Control
Optimal Cruise Research to extend range (i.e. Porpoising)
Windmilling Turbo-Gen Increased Endurance Battery-only Endurance