
GLOBAL
HEALTH
SUPPLY CHAIN SUMMIT

Turning Innovation into Impact: The role of collaboration in leveraging UAVs for payload delivery

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VillageReach
Starting at the Last Mile

Global Health Supply Chain. Dar es Salaam Tanzania
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The Underlying Challenge

- Over the last decade, innovations in delivery systems have achieved important strides in population health
- Nonetheless, supply chain breakdowns still occur, particularly in last mile contexts with limited infrastructure
- Unmanned Unmanned Aerial Vehicles (UAVs) offer a new approach to delivery that many groups are looking to assess

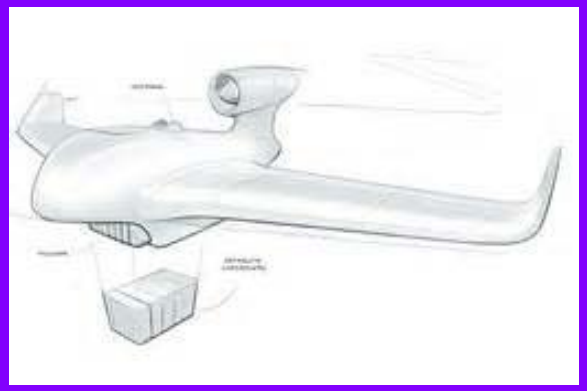
How do we leverage shared interest, efforts, and learning around UAVs for greatest impact?

The Transportation Status Quo

Infrastructure Challenges

UAV Technology

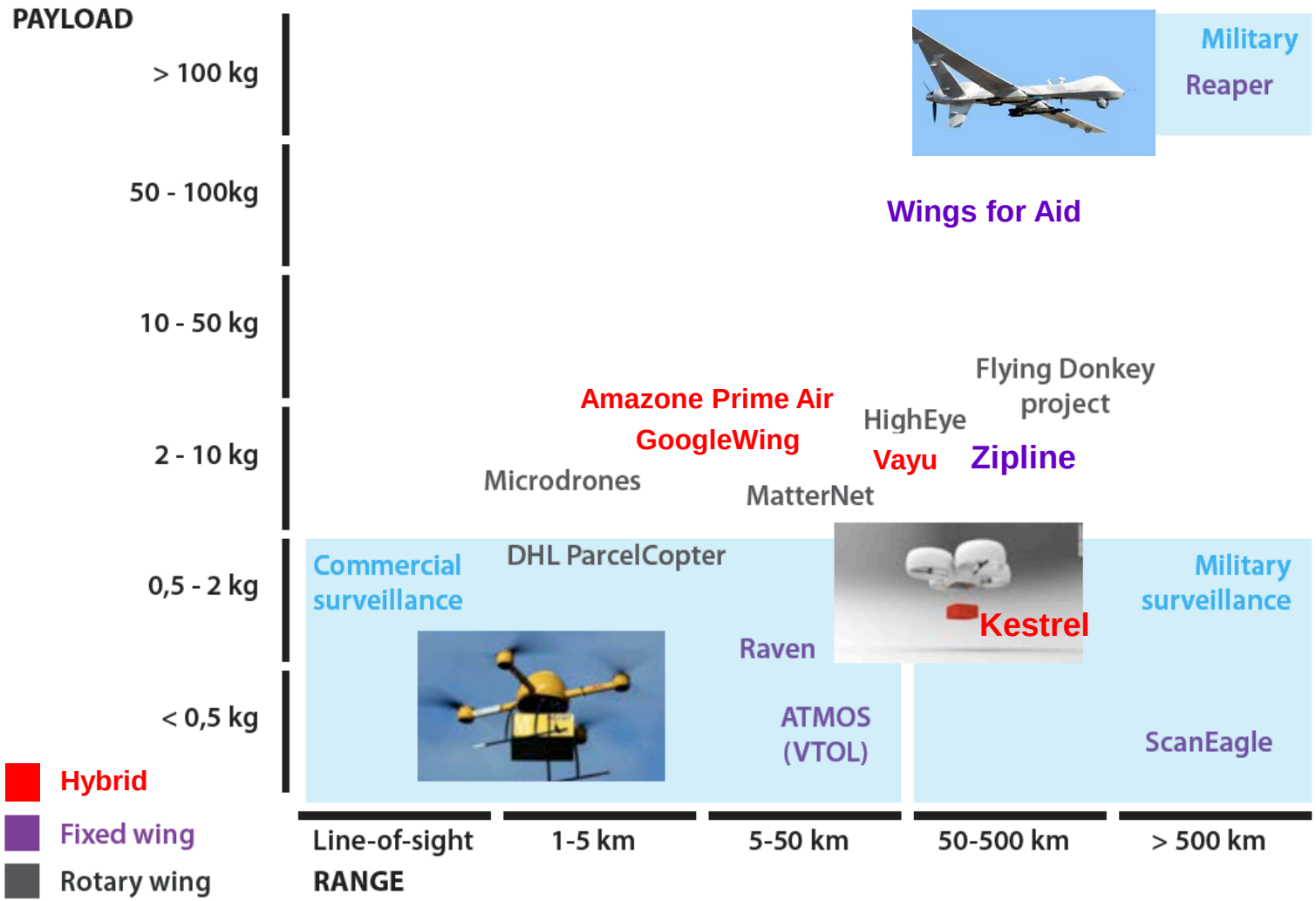
Fixed-wing



Rotary-wing

Hybrid

Payload vs Distance



Modified from Wings for Aid slide

Challenges

- Technology
  - Distance vs. Power
  - Distance vs. Weight
  - Transmission signal
  - Battery charge & materials
  - Collision avoidance auto-mation
- Cargo
  - Fragile
  - Sensitive to temp
  - Expensive
  - Limited space
  - Limited weight
  - Biological/biohazard
- Environment
  - Bad weather
  - Terrain/topography
  - Animals & Birds
  - Human interference
- Economic
  - Cost of drone
  - Infrastructure
  - Pilot training
  - Maintenance
  - Additional system devices
- Political
  - Regulations
  - Military connotations
  - Security – national, data
  - Public acceptance
  - Growing local technical capacity
- Social/Community
  - Evolving perceptions (military → healthcare)
  - Accidents – people & property
  - Security – national, local
  - Building UAV understanding

Challenges

Challenges with Assessing, Developing Emerging Technologies

- Duplication/redundancy of efforts
- Resources spent on reinvention
- Isolated learnings
- Lack of leveraging complementary activities
- Networks of collaborators don't yet exist
- Rapidly-changing landscape
- Staying up to date with new R&D and evidence
- Defining specific use cases & building tech to spec
- Access to experts, tech providers in growing field

UAV for Payload Delivery Working Group (UPDWG)

Who: Groups invested in the development, advancement, and application of UAV in public health and supply chain systems.

Goals: Provide an informal, centralized mechanism to share information, coordinate efforts, and connect with partners & technologies.

Activities: Roundtable calls, featured webinars, discussions, form sharing of resources

Organizations

unicef
PATH
WFP World Food Programme wfp.org
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. . .

Manufacturers

MATTERNET
WINGS FOR AID
VAYU
zipline
Flirtey stuff by air anytime anywhere
. . .

Funders

USAID FROM THE AMERICAN PEOPLE
Bill & Melinda Gates foundation
Gavi The Vaccine Alliance
. . .

and more

LLamasoft Supply Chain By Design
Johns Hopkins Bloomberg School of Public Health
BD
. . .

Member Projects in Action

zipline

Delivering blood supplies in Rwanda

- HWs request delivery by SMS
- UAV launched within minutes of request
- Delivery parachutes into parking-lot sized target (no landing needed)
- Huge support from Rwandan govt, interest in building centralized UAV hub

VAYU

Transporting kits and lab samples

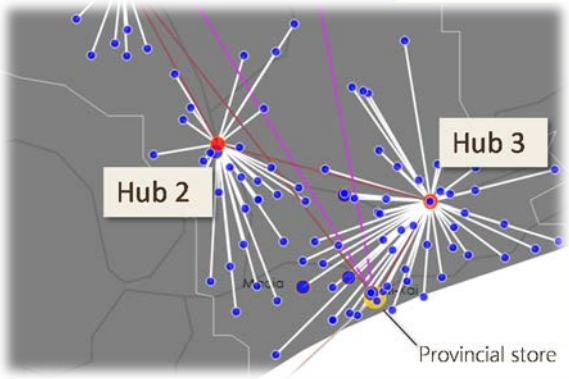
- Madagascar -- HWs identify cough, request TB test kits
- UAV lands, HWs unload & reload with new cargo
- Blood and fecal samples sent from rural HFs to central lab (reverse)
- Training HWs in new transport system

unicef VillageReach MATTERNET

Assessing UAVs for DBS transport

- Malawi -- faster infant diagnosis of HIV
- Compare UAV transport vs. motorcycle for DBS sample transport
- 93 flights between health center and hospital
- Gain government permissions & support
- Collect costing data of total monthly transport, vehicle life, fuel, distance

Member Projects in Action



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Modeling potential benefits, cost

- HERMES Modeling UAV transport of vaccines in Mozambique
- Simulating multi hub and spoke model, distance requirements
- Payload capacity vs. number of trips
- Assessing availability, cost per dose

fhi360 THE SCIENCE OF IMPROVING LIVES

Understanding perceptions of UAVs

- Attitudes around UAVs for non-military uses in Tanzania
- Feedback from private citizens and govt officials on UAV mapping flights
- Both groups positive about use, saw utility in many applications.
- Need for: raising awareness, building local capacity, develop regulations, best practices

We Robotics

Flying Labs for local ownership

- Co-creation for innovation in developing & at-risk countries
- Building local capacity, buy-in
- Partners: Universities, NGOs, govt, UAV companies
- Engaging stakeholders, applying learnings
- Drone Code of Conduct for Social Good

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Leveraging UAVs to address emerging disease threats

- Building stronger strategies through collaboration
- Engaging various levels of healthcare – emergency AND system solutions
- Emphasizing community engagement

Thank You

Suggested Reading

- Vaccine Journal (HERMES) -- *The economic and operational value of using drones to transport vaccines*
- UAViators -- Drone Code of Conduct for Social Good
- FHI360 study -- Using UAVs for Development: Perspectives from Citizens and Government Officials in Tanzania

To join the UPDWG mailing list, email rachel.powers@villagereach.org

Visit www.uaviators.org/teams/payload-team

Thank you