Scalable Traffic Management for Emergency Response Operations (STEReO)

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roots in air traffic control research

traditional air traffic control research and simulation
future of aviation

advancing technologies enable new aircraft types, increased demand for airspace, and need to safely manage the airspace
UAS traffic management (UTM) project

new paradigm of air traffic management using a distributed network of service providers
clear path forward for multiple areas of research, often overlapping
STEReO
Scalable Traffic Management

NASA’s UAS Traffic Management (UTM) System

- access the airspace and coordinate use
- standardized platform for sharing operation information & data
Emergency Response Operations

existing challenges include...

- limited communication and infrastructure
- manual coordination to deconflict airspace
- large number low altitude aerial missions (e.g. search and rescue)
- remote sensing data can’t be received in a timely manner
To what extent can a STEReO ecosystem

Reduce response times

Provide operational resiliency to dynamic changes during a disaster event

Scale aircraft operations
STEReO

communications

human factors

UTM services

domain expertise & tools

autonomy

National Aeronautics and Space Administration
Communications persistent, interoperable, and expanded allocation of band for tracking UAS operations without burdening existing networks
UTM Services
airspace coordination and management

alleviates workload associated with incorporation of UAS operations
Autonomy
mission driven on-board
decision making

support mission tasks and safe
separation with payload directed
flight
Domain Expertise & Tools
subject matter experts and stakeholders
collaboration on problem definitions, barriers and solutions
Human Factors
concept and information requirements
distributed virtual collaboration tools that demonstrate the information to action cycle
Targeted use-cases

California wildfire field demonstration

Florida post-hurricane simulation
The application of UTM, ad-hoc communication networks, vehicle to vehicle communication, and onboard autonomy to enable airspace management and ensure the safety and resilience of the operations.
Distributed Virtual Collaboration

Collaborative tools to ingest data and distribute a common operating picture for all stakeholders for strategic planning and decision-making.
Why is STEReO transformational?

- Addresses resiliency gap for UTM/UAM ecosystem
- Advances state-of-the-art in onboard autonomy
- Foster the UAS/UTM expansion to public safety community
Why Is STEReO “Transformational?”

Who cares?
FAA, UAS industry, Public Safety Agencies, and General Public

Community benefits
- faster recovery
- more situation awareness during disaster

System level benefits
- increases capacity of operations under a restricted airspace (e.g. TFR)