LOCAL AUTHORITIES AND THEIR DIRECT RESPONSIBILITIES FOR DEVELOPING DRONE / eVTOL ECO-SYSTEMS

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A Developing Policy Document prepared by:

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Cities will have a critical role in development of urban air mobility/advanced air mobility (UAM/AAM) and municipal drone industries worldwide. But what exactly should this role be? CIVATAglobal members have started to discuss these issues. The following text highlights some early conclusions and further areas for discussion and debate. This paper will be extended in scope and granularity over the coming months and years, with members able to provide further inputs which will help guide the debate on where roles and responsibilities of different stakeholders – inter alia national aviation safety regulators, operators, central and local governments – should lie. Members have highlighted local authority responsibilities in the following areas:

1   *Deciding when to launch drone/UAM services and identifying priority services*
2   *Deciding the sites of drone take-off and landing areas, eVTOL vertiports*
3   *Deciding the location of air corridors for drones/eVTOLs to balance flight efficiency and citizen safety*
4   *Providing critical and dynamic aeronautical information to the CAA on movements of people and high-altitude platforms (such as cranes)*
5   *Liaising with police and security agencies to develop a policy to deal with rogue drone operations*
6   *Defining no-go zones for environmental, wildlife and other ground protection issues*
7   *Integrating drone/eVTOL flight networks with ground infrastructure*
8   *Defining the locations of ground-based conspicuity surveillance for low-level detection of crewed and uncrewed aircraft*
9   *Taking the leading role in the management organisation which develops, manages and operates the drone/eVTOL network*
10 *Licensing drone/eVTOL operators and operations*
11 *Specifying the requirements for any UTM to provide a service within a defined area alongside terms of reference*
12 *Agreeing the placement of sensors on buildings for drone/eVTOL operational communications*
13 *Setting out the local rules for defining the operational envelop, the priority of services, the environmental limits in terms of noise and hours of operation*
14 *Developing strategic infrastructure financing plans (see also 5).*

15 Integrating UAM planning with a local authority's decarbonisation strategy

The next version of this paper will be published in January 2021, developed from inputs from members at member meetings and direct inputs into the paper by contacting the editor at phil.butterworth-hayes@civataglobal.org.

1. Launching drone/UAM services and identifying priority services

Cities can have a vision for Urban Air Mobility (UAM) – but it will be high-level. It will need to be supported by private sector industry programmes and clear investment resources. So the end result is likely to be very different from the vision. In particular, the decision on when to launch the first services, and what these priority services should be, will need to be taken by several stakeholders and not the city alone, unless the city is prepared to commit considerable funds to the programme. Each city will negotiate its own role in the stakeholder-group eco system.

To prepare for future-oriented plans and increase public acceptance, it is important that the local government discusses with existing and future stakeholders a range of service options; these discussions will need to be harmonised with current strategic city planning programmes. Any new UAM service should not be a threat to existing businesses, but rather should be considered as a complementary service and improving the life of citizens.

As a primary priority, cities should engage their communities in understanding public appetite for drone/eVTOL services and public concerns.

| Best practice examples: |
| Operational references: |

2. Deciding the sites of drone take-off and landing areas (TALOs) and eVTOL vertiports

Public space is a scarce resource so the industry should think about private land as the location for initial services. Many local authorities will lack the information on how to integrate this new transport mode into existing transport networks so any local government drone/UAM operation will probably take longer to implement than many plans suggest. However, most local planning authorities will have a statutory duty to decide whether a TALO/vertiport programme based on private or public land can go ahead.

Local authorities will need to work with aviation regulators and industry experts to integrate UAM infrastructure planning in their transport strategies, especially when considering how high-rise structures can be adapted for UAM use, both in terms of TALO requirements and associated power supply needs. This should also apply to large shopping- mall and business centres, hospitals, ports, etc.

| Best practice examples: |
| Operational references: |

3. Deciding the location of air corridors for drones/eVTOLs to balance flight efficiency and citizen safety

Ideally, drone/passenger eVTOL operators should be able to fly free route airspace routes across the urban sky, taking into account restricted areas, dynamic NOTAMs and prescribed noise sensitive/safety management procedures as defined in the airspace map used by flight planners.

In some cases, because of the number of restrictions, airspace users will have to follow closely defined routes of corridors. The choice of FRA or corridors will depend on use-cases and how much flexibility there is. For example, many hospitals in London are accessible by the river so once the platform technology has been proved, the location and management of highways in the sky can be developed. The case, from a demonstration viewpoint, would not have to have to be that involved because there is likely to be a high level of public acceptance for medical and emergency drone services. Local authorities should prioritise safety and noise acceptance as a prime issue in developing community acceptance.

One role CIVATA might play is to develop a public/private partnership to develop a detailed roadmap, from a top-down approach. The use case has to be decided before the landing-sites are identified and, because of the complexities of issues such as zoning, the initial TALOs should be located in privately-owned properties/land.

Best practice examples: Operational references:

4. Providing critical and dynamic aeronautical information to the CAA on movements of people and high-altitude platforms (such as cranes)?

The location of tall cranes and buildings – aeronautical data, in other words - is more of an operational issue than a planning one, so local authority-derived data needs to be coordinated with the police and fire departments. Vertiport designs are being developed with the airspace landing and take-off routes already integrated, so these must be developed along current aviation/airspace planning procedures. We cannot treat eVTOLs differently from aircraft flying today, which means integrating into them into the current airspace system where aviation stakeholders already have a clear role. We do not need to re-invent the wheel; most of the standing operating procedures are in place. Any new service related to eVTOLs/drone should be discussed and harmonised with the policy and plans of the national aviation regulator and air navigation service provider.

The final arbiter of aeronautical information/NOTAM data is the civil aviation authority – but local authorities are key stakeholders and will need a seat at the table when it comes to developing aeronautical procedures for UAM operations.

Best practice examples: Operational references:

5. Liaising with police and security agencies to develop a policy to deal with rogue drone operations

There is a clear role here for local authorities. An early imperative will be to research the areas of responsibility for rogue drone management, as they are split between national government, local government, security and policing agencies along with the availability of low cost but effective identification and related mitigation systems (see also 12).

Responsibility for the security and safety of urban airspace differ from country to country, so it is important these responsibilities are defined at an early stage.

Best practice examples: Operational references:

6. Defining no-go zones for environmental, wildlife and other ground protection issues

There is a clear role here for local authorities.

Stakeholders will need to harmonise rules and regulations related to protected areas and the environmental impact. The needs/responsibility of each stakeholder should be discussed and defined.

Best practice examples: Operational references:

7. Integrating drone/eVTOL flight networks with ground infrastructure

Vertiports have already developed material on airspace design. But what data is available to local authorities on airspace structures beyond the approach/take-off paths into vertiports and up to 400ft? There is little or no information on this – or who will decide optimised route structures if there are two vertiports/TALOs with overlapping flight patterns. The city will need to have an early, common operating picture of overlapping coverage and gaps.

Best practice examples: Operational references:

8. Defining the locations of ground-based conspicuity surveillance for low-level detection of crewed and uncrewed aircraft.

Local authorities will need to work with relevant aviation experts to determine optimised placement of relevant communications, navigation and surveillance technology to allow for resilient network coverage in an urban environment. A crucial aspect of the preparation of the flight route network is cooperation with mobile telecom service providers, who will be important investors.

Best practice examples: Operational references:

9. Taking the leading role in the management organisation which develops, manages and operates the drone/eVTOL network

The local authority has a primary role in planning multi-modal transport networks – including the potential repurposing of buildings, such as bus stations and car parks which could be considered as possible vertiport or TALO sites. But it is not yet clear whether this responsibility should be extended to cover the entire UAM/drone eco-system.

However, in long-term planning it will be vital for local authorities to develop both high-level and detailed views of how drones/eVTOLs will be integrated within future autonomous vehicle networks, especially how bandwidth communications challenges can be met in the CV-X (vehicle to everything) domain, The threat is that these networks could easily run out of bandwidth, even in a 5G environment. That will require liaison with 5G providers as well.

Best practice examples: Operational references:

10. Licensing drone/eVTOL operators and operations

There is a clear role here for local authorities. The granting of licences for operators should be in the hands of the local authorities, especially in relatively small locations. This could be on the basis of current ground-taxi operations, to ensure the safety of passengers and compliance with local authority rules. It is not yet clear how the air taxi market will develop – whether there will be a small number of large fleet operators or a large number of owner-operators

Best practice examples: Operational references:

11. Specifying the requirements for any UTM to provide a service within a defined area alongside terms of reference

Local authorities may or may not have a direct role in UAS traffic management (UTM), but in terms of determining an optimal UTM governance system, the principle of the free market should be applied, with UTM service providers being able to deliver niche competitive services, exchanging safety-related and flight plan data on a common platform with industry standards for data sharing (references required).

But there are outstanding questions:

- Will the local authority, or the delegated transport authority, be the organisation which provides access to the airspace?
- If so, what is the basis for the charging system?
- How should the costs for flying in different parts of an airspace at low level be determined?
- What responsibility will the local authority have in developing a surveillance network for all aircraft at low level (not just drones and eVTOLs)?
- How will UTM and vertiport/TALO operational charges be regulated?

Local authorities should licence these operations according to the national regulatory system in place – in which case the licensing role could be mainly administrative. All potential UTM service providers will need to be incentivised, rather than disincentivised, by the framework of regulations surrounding service provision, with private-public partnerships perhaps prioritised.

Best practice examples: Operational references:

12. Agreeing the placement of sensors on buildings for drone/eVTOL operational communications

Local authorities will have a key role in deciding the location and prioritisation of transmitters and sensors for both land and air future autonomous vehicle communications, distinct from the UTM network. A crucial aspect of the preparation of the flight route network is cooperation with mobile telecom service providers, who will be important investors.

Best practice examples: Operational references:

13. Setting out the local rules for defining the operational envelop, the priority of services, the environmental limits in terms of noise and hours of operation

Ambulance/emergency services should always have priority - but how much priority should they be given for positioning or training flights; non-emergency services will need to be determined.

The involvement of other stakeholders, including the industry and public, is critical to preparing realistic plans and identifying priorities. A transparent and future-oriented plan will increase public acceptance.

Best practice examples: Operational references:

14. Developing strategic infrastructure financing plans (see also 5).

Local authorities will need to develop UAM infrastructure development financial and engineering plans, most easily via a private-public-partnership. Funding for the following infrastructure elements will need to be found:

- Vertiports
- Ground infrastructure to support vertiport operations and integration with legancy transport hubs
- Micro weather system sensors
- Airspace route designs
- Energy supplies
- Battery storage /charging systems
- CNS/UTM hardware/software, including sensors and communications systems,
- Aeronautical information inputs

| Best practice examples: |
| Operational references: |

15. Integrating UAM planning with a local authority's decarbonisation strategy

Local authorities will need to implement UAM services as part of their wider de-carbonisation strategies.

| Best practice examples: |
| Operational references: |