This white paper addresses the need for a public-private partnership approach to Urban Air Mobility, with an emphasis on consortia, on a city-by-city basis to create cost-effective funding and infrastructure development.

How Public-Private Partnerships Will Lead Urban Air Mobility

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How does our society transform urban mobility from the now—the astonishing electric vehicle prototypes, the conferences and summits, the thousand-and-one speculations—into that future of highways in the sky, the future we clearly know is on the way? It is a crucial question, not just for societal benefits—reduced congestion, greater mobility for those who require it, new technical jobs, and tax revenues—but also because tens of billions of investment dollars are riding on it.

Each metropolitan area has a unique DNA, a complex blend of current transportation issues, congestion, population density, airports, transportation infrastructure, regulation, business aviation, GDP, local politics, per capita income, and a host of other factors that contribute to the likelihood of it being an early or late user of eVTOL (electric vertical take-off and landing) aircraft. NEXA has analyzed 74 cities around the world and found that despite the many differences, even the smallest cities will eventually create sustainable and profitable UAM services for their communities.

UAM needs infrastructure to operate. But who will fund the infrastructure— vertiports and air traffic management systems—for these cities? The answer will vary for each city depending on the complex factors of affordability, public funding, private investment, and timing.

Public Private Partnerships

A public-private partnership (known as a PPP or P3) is defined as a cooperative arrangement between two or more public and private sector entities, typically for a long-term project. P3s are most commonly used for infrastructure development projects, such as public buildings, energy facilities, transportation systems, and public utilities. In aviation, and especially internationally, P3s have been used to develop and modernize airports, as well as air traffic control (ATC) systems. P3s are an attractive option for infrastructure financing as they offer governments private sector capital, risk reduction, efficiency and best practices. Taxpayers and stakeholders alike benefit: costs are kept low, projects stay on schedule, and private industry participants realize positive value on their investment.

But it is not just cities that can benefit from P3s. Given the complexity of Urban Air Mobility, and all the operational hurdles standing in the way of a sustainable (e.g. profitable, safe, financeable) ecosystem, P3s are a natural way for vehicle and UATM manufacturers, vehicle operators, infrastructure developers, investors, local governments and regulators to come together as a team to develop vertical transportation.

A successful UAM consortium will take all of this into account and cultivate good relationships with city regulators.

UAM Consortia in Action

Some groups are already working hand-in-hand with city and state governments to explore the UAM opportunity. Let's look at a few.

Figure 1 Uber Elevate Vision of Air Mobility Operations in Dallas

The "Uber Elevate" Consortium

Uber is working to begin tests flights in 2020 and commercial operations in 2023. Even though it is the most visible player in the space, the $54B company cannot install a UAM ecosystem on its own; it has leveraged six aircraft manufacturers, twelve ecosystem partners, and three cities (Dallas, Los Angeles, and Melbourne, Australia). Uber has developed extensive relationships with regulators and infrastructure developers and should be well positioned in 2023 to capture its three target markets.

This October marks three years since Uber published its iconic Elevate Whitepaper. Since then, the firm has invested significant time, energy, and resources into making its vision a reality. Uber was the first major purveyor of the idea that many companies and stakeholders need to be brought to the table in UAM because each has a unique role in achieving this new transportation paradigm. While Uber is building consortia within its overall Uber Elevate ecosystem, it is unclear how its on-demand mobility solutions will be regulated within test markets, how the local population will deal with the additional noise and air traffic, and whether or not this mode will be commercially viable.

Volocopter, Skyports, and the Civil Aviation Authority of Singapore

On October 21st, the Intelligent Transport Systems (ITS) World Congress was hosted at the Suntec Singapore Convention & Exhibition Centre. A couple blocks away, near Marina Bay, stood an unusual-looking construction project of metal beams and supports. Volocopter, the German eVTOL manufacturer, has teamed up with the London-based infrastructure group Skyports to unveil the world's first air taxi vertiport in Singapore.

The design and specifications of this prototypical vertiport may set industry standards around the world, especially if commercial operations are able to take flight as planned. And this seems likely. While most aircraft manufacturers are still in the design or testing phase, Volocopter is on the precipice of operating commercially. Because of their collaboration, both Volocopter and Skyports are positioned to benefit immensely. As the first successful vehicle and vertiport, they could dominate the global market for some time to come.

Figure 2 Construction of the Volocopter "Voloport" in Singapore

Although the World Bank has rated Singapore as being "middle-of-the-pack" in terms of procuring infrastructure public-private-partnerships, it is still a global leader in terms of promoting innovative technology testing. Not only is Singapore actively implementing Urban Air Mobility, but it is also a leader in testing terrestrial autonomous vehicles and plans to deploy driverless buses in 2022.

UPS, Matternet, and the North Carolina Department of Transportation

Though not an air taxi concept, the UPS & Matternet drone logistics service belongs in the Urban Air Mobility ecosystem. This relationship is especially significant because the FAA recently awarded UPS and Matternet the first full Part 135 certification for commercial drone airline operations. The use case employed by UPS and

Figure 3 - Matternet Partners with North Carolina DOT and With UPS

Matternet is one of critical importance, as well: supporting healthcare professionals and providing medical supplies to hospitals by utilizing delivery drones and beyond visual line of site (BVLOS) operations, with oversight provided by the FAA and the North Carolina Department of Transportation. Although the current scale of operations is small, operating out of the WakeMed hospital campus in Raleigh, North Carolina, it is anticipated that this service will expand to additional hospitals in the region.

The UPS Flight Forward mission is to continue to integrate drones into the UPS logistics network. This is fantastic news not only for Matternet, but for the rest of the drone delivery manufacturers in the market. Companies like Flirtey, Elroy Air, and Zipline are poised to bring their drones to market as well, either through UPS's diversified expansion or through other logistics providers looking to get certified.

Let Us Help

NEXA Capital has a robust history of engaging in P3 work, helping companies work alongside the FAA, state, and local governments to produce partnerships that achieve lasting results. We are passionate about facilitating the creation of formal business partnerships that make innovation possible. There is tremendous opportunity to work together in the UAM space. Discovering your next business partner could be the catalyst that takes your operations to the next level.

Our new analytics services are available through www.nexa-uam.com to assist cities and consortia to plan profitable city-scapes ready for UAM introduction.

Our work is validated by over 30 years of aerospace and business aviation expertise, having helped countless clients large and small navigate unique aviation challenges with ease.

Contact us today by e-mail at daniel.miller@nexacapital.com or call us at 202-499-5070 to discuss your challenges and learn how we can help.

Additionally, we will be speaking and exhibiting alongside our numerous industry partners at future industry events.