Do we already see the impact of Advanced Air Mobility or is it too early to tell?

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revolution .aero

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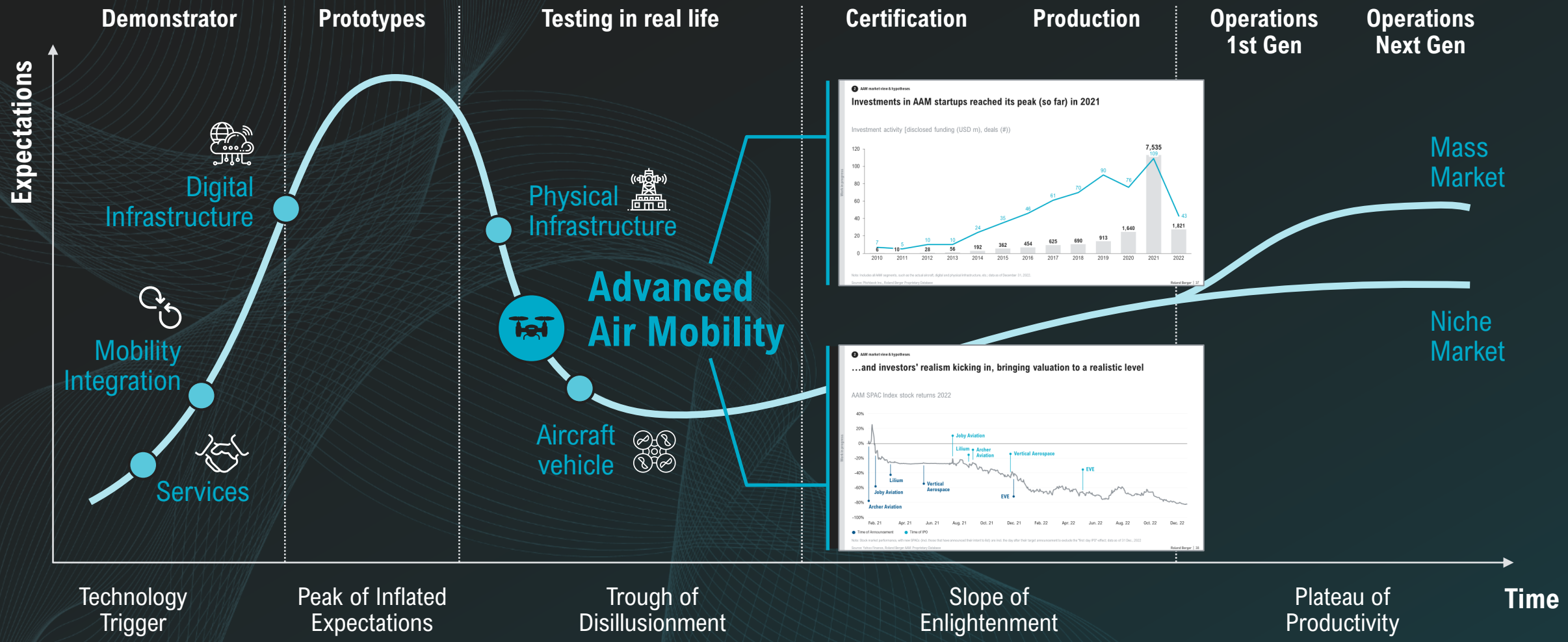
Currently, AAM is at the trough of disillusionment: After the SPAC-craze, investor realism is kicking in – Is AAM too good to be true?



Source: Roland Berger

There are huge expectations both for UAM and RAM – However, what would happen to the AAM industry if UAM might not deliver the expected results?

Emergence of AAM segments

Helicopter

Revolution

UAM/ eVTOL

Revolutionary electrical vertical take-off and landing (eVTOL) vehicle

5-19-seater A/C

Evolution

RAM

Evolutionary electrical aircraft

Implications

- UAM Hype has also accelerated the evolution of existing 5-19 seater aircraft towards electrical propulsion (RAM)
- Given the current status of the industry we expect UAM to be in operation earlier (e.g., in 2025/2026) than RAM
- However, we expect that the whole AAM industry might not take off in case UAM does not deliver the expected results (e.g., unit cost economics, safety, etc.)
- Therefore, focus should be now on bringing UAM to live

Source: Roland Berger

UAM/ eVTOL vehicle are becoming a reality now given four major proof points – Also first cities/ regions planning towards operation

Proof points for technical maturity of UAM/ eVTOL vehicles – Examples

1

UAM/ eVTOL OEMs making progress with certification and test flight results

2

Promising UAM/eVTOL development progress and supply chain build-up

3

Heavily invested established aviation/ aerospace, automotive companies

4

First cities/regions globally are planning towards UAM/ eVTOL operation

We will see first commercial operations by 2025/2026 in frontrunner cities[1)]

1) If no major delays in type certification occur

Source: Desk research, Company information, Roland Berger

However, the existing number of vertiport developments is insufficient to accommodate UAM orders – Closing gap possible through further partnerships

Number of vertiports needed based on eVTOL orders vs. known vertiport developments

Assumption: 5 eVTOL aircraft stands per vertiport on average

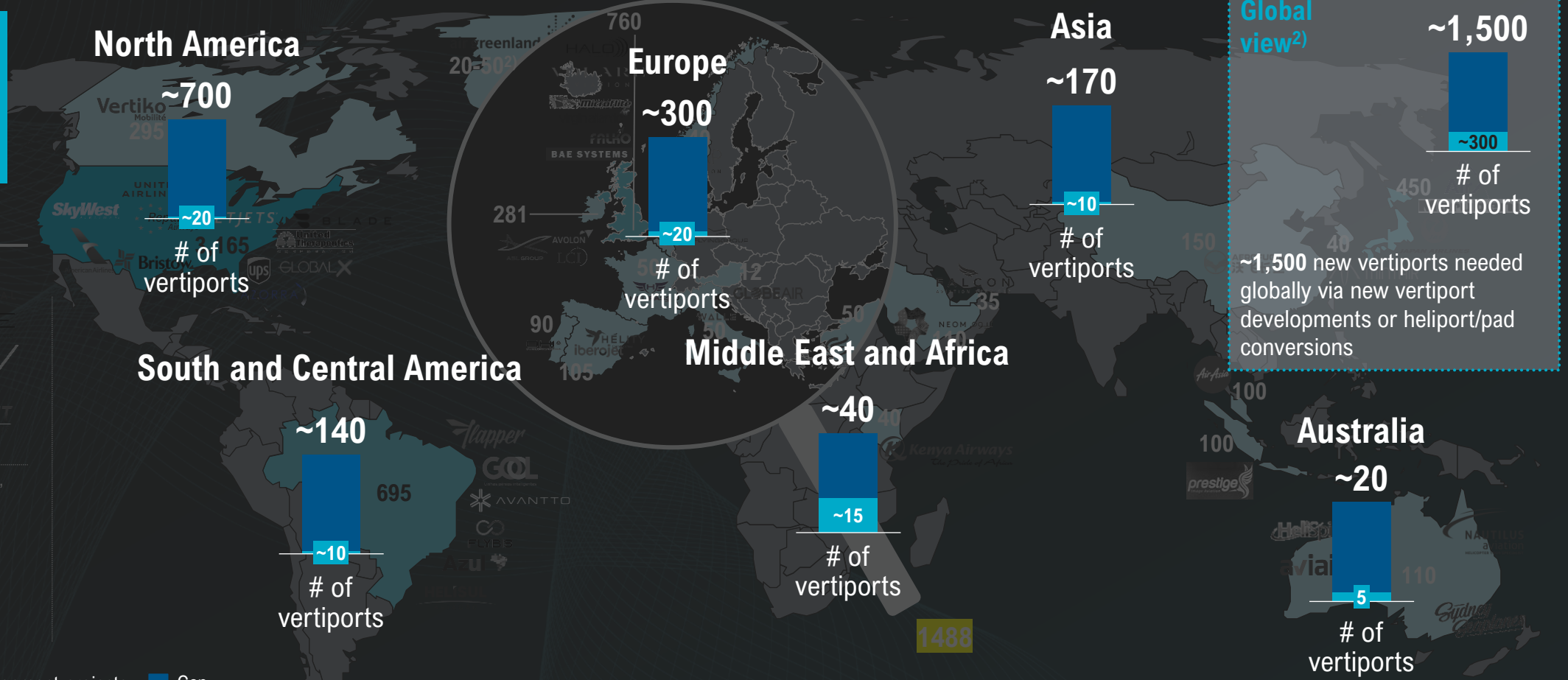
Selected OEMs

Index: The darker the color gets, the more orders are placed:

3200

0

*Pre-orders from airlines on UAM are included



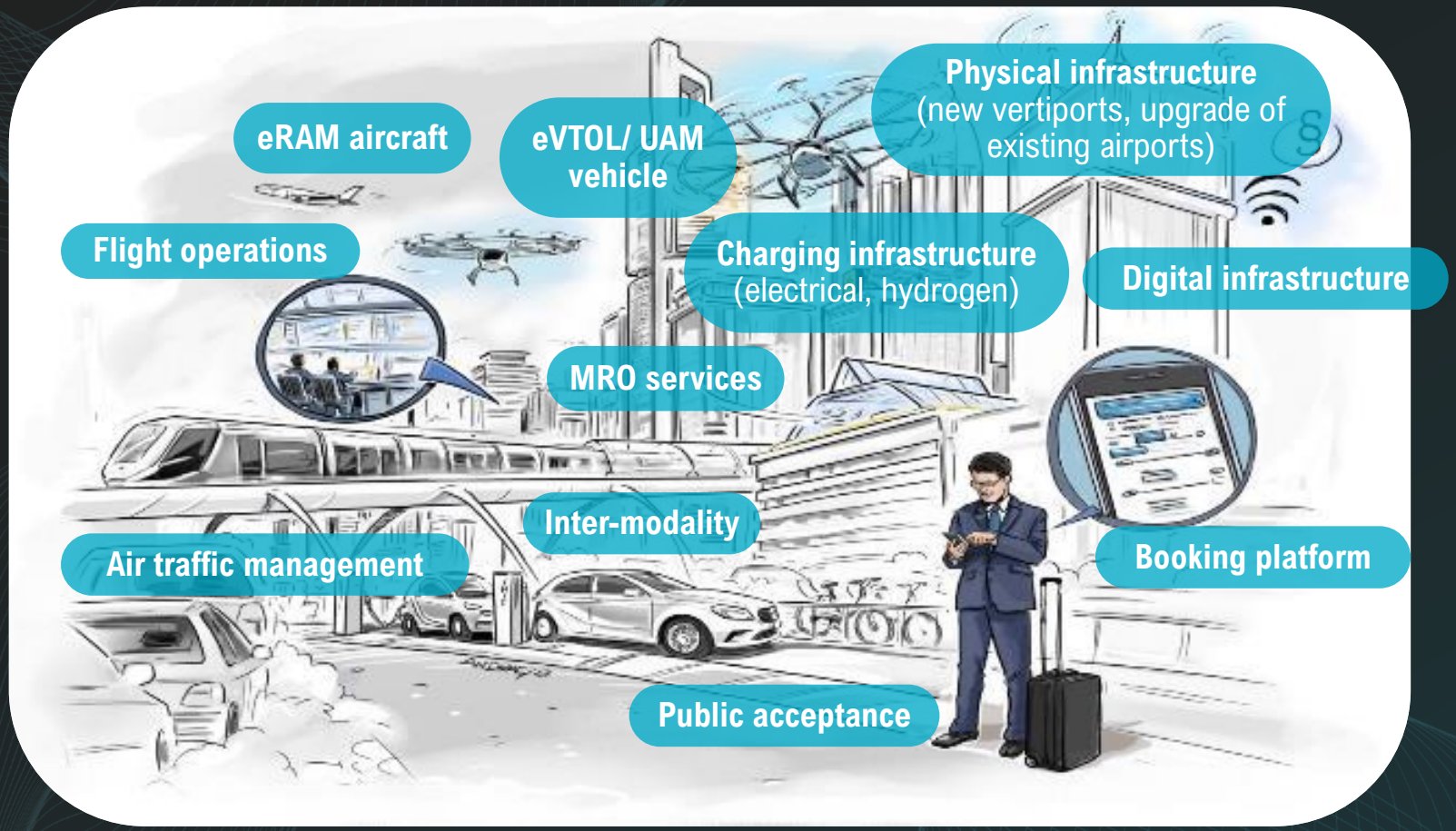
Known vertiport development projects Gap

1) Not displaying ~600 undefined orders for UAM OEMs EHang, Eve, Volocopter and Jaunt Air Mobility; 2) Air Greenland ordered Vertical Aerospace aircraft via Avolon and 20-50 aircraft are expected to be allocated to Air Greenland
2) Includes additional ~120 vertiports needed for ~600 undefined aircraft orders yet and ~250 planned vertiport projects without specified location

Source: Roland Berger

In addition, to the physical infrastructure around vertiports also further supporting infrastructure needs to be build up

AAM ecosystem



- It is not just about the eVTOL/ UAM aircraft – AAM operations are a system of systems to be put in place
- To get air mobility "off the ground" it is necessary to take the eVTOL aircraft itself, and the service enabling AAM ecosystem into consideration
- The overall ecosystem needs to be set up in a coordinated way, especially in the beginning

Source: Roland Berger

UAM ecosystems have started to form in major global cities – However, the number of cities/ regions is limited and also approach not unified yet

Building blocks of UAM ecosystems (selection)

City examples	Paris	Rome	Munich	Los Angeles	Orlando	Tokyo	Osaka	Seoul	Singapore	Dubai
										
Involved companies (Selection)	RATP, CHANG, VOLOCOPTER, Skyports, THALES, AIRFRANCE	Atlantia, LEONARDO, VOLOCOPTER, URBAN, enel way	AIRBUS, Flughafen München, SKYROADS, Urban-Air Port	supernal, BLADE, Helinet, SKYROADS, overair, LADOT	LILIUM, ferrovial, MOVE NONA, NASA	VERTICAL, AVOLON, VOLOCOPTER	VOLOCOPTER, VERTICAL, AVOLON, Skyports, SKYDRIVE	SK Telecom, HYUNDAI, supernal, Incheon Airport, Joby, Into the Urban Sky	AIRBUS, CAAS, VOLOCOPTER, OneSky, Skyports	Skyports, VPORTS, Joby, FALCON
Building blocks										
Government	●	○	○	○	○	○	●	●	●	●
Other public institutions	●	○	○	●	●	○	●	●	◐	●
Aviation authorities	●	●	○	●	○	○	○	○	●	●
eVTOL OEM	●	●	●	●	●	●	●	●	●	●
Airport/vertiport	●	●	●	●	●	●	●	●	●	●
Other industry players	●	●	○	●	○	●	○	●	●	○
Defined use cases/routes	●	●	○	○	●	○	○	○	●	●
Flight tests/sandbox	●	●	○	○	○	○	○	○	●	●

● Available ○ Not available

Source: Secondary research; Roland Berger

Therefore, much more needs to be done now in an orchestrated manner to bring UAM to life in frontrunner cities – RAM might depend on UAM success

Key success factors to make UAM fly

City-by-city approach (focus on individual cities **first**)

Orchestrate ecosystem build-up via investments and partnerships

Involvement of all relevant stakeholders (e.g., eVTOL OEM, potential operator, surrounding transportation ecosystem, public, regulators, authorities)

Testing AAM in a real-life environment with first use cases (e.g., Paris 2024)

UAM/ eVTOL industry needs to deliver according to expectations as well as promises to investors –

Otherwise RAM market might not receive required funding in the future

Roland Berger