

Prepared for



Six Steps to Secure UAM Infrastructure Investment

Speaker:

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Chicago, April 29, 2019



Every City's

Challenge:



“It’s time to look at autonomous aircraft. The addressable market is \$1.5 Trillion in our base case by 2040.”

Morgan Stanley Research, December 2018

NO UAM INFRASTRUCTURE

=

**HIGHLY LIMITED UAM
MARKET OPPORTUNITIES**

Urban Air Mobility – Economics and Global Markets: Key Objectives

- Business Intelligence to Inform Investment Decision-Making...
- Investment Intelligence for the Entire UAM Industry



78+ Cities Examined and Benchmarked



NEXA Advisors



**Urban Air
Mobility**

Economics **and**
Global Markets

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Inputs

Analytical Drivers

Modeling and Simulation

Results

Findings

- Metropolitan Demographics
- Population and Density
 - GDP per Capita
 - Age Distribution
 - Congestion
 - Taxi Fleets and On-Demand
 - Public Transport
 - Emergency Facilities
 - Airports/Heliports
 - Helicopter Fleets
 - Corporate HQ
 - Business Aviation Fleets

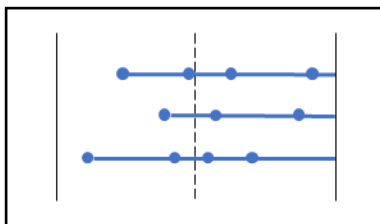
- Infrastructure Costs
- Nominal Verti/Heli Facilities
 - Charging and Fueling Systems
 - Passenger Egress

- Vehicle & Supply Chain
- OEM Fleets
 - Electric/Hybrid
 - Supply Chain and MRO

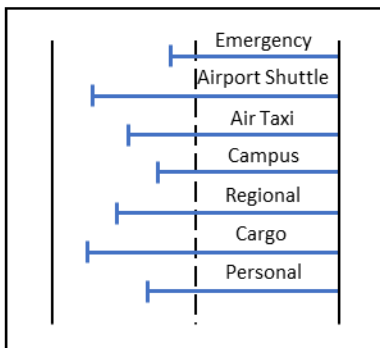
- Demand Assumptions
- Phasing
 - Pricing

- Regulatory and Community Constraints
- Noise
 - Certification
 - Safety
 - Public Perceptions

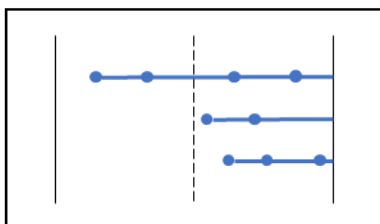
Ground Infrastructure



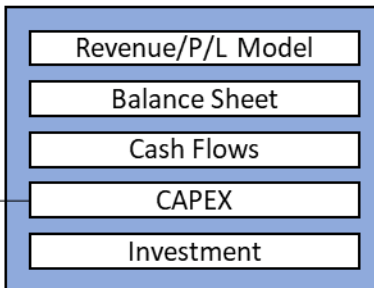
UAM Service Demand



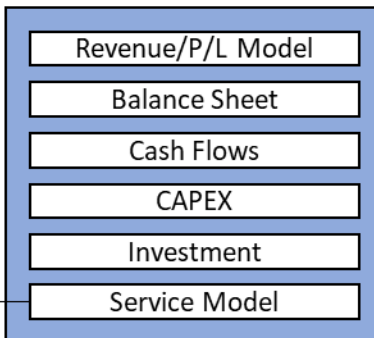
UTM Infrastructure



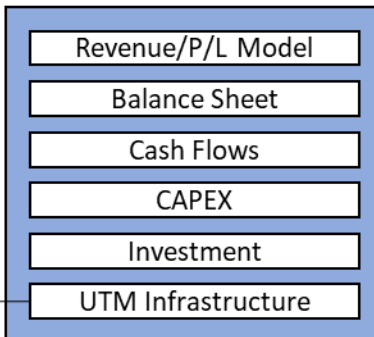
City PPP Model



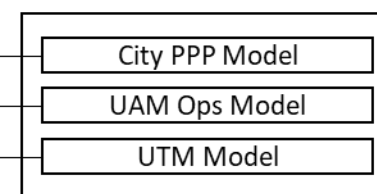
UAM Operating Model



UTM Model



Dashboard



Econometrics

- Direct
- Indirect
- Induced
- Catalytic Sector Effects

Tax Revenues

- Federal
- State
- Local

- Viability
- Fundability
- Affordability
- Public Acceptance

What is the outlook for 70 of the largest UAM metropolitan areas globally, and what policy, technology, and financial issues will individually define their success?

What is the expected size of UAM markets over the next 20 years, but especially the next 5? What are the key drivers that are absolutely essential for market expansion?

Emergency Services

- Medivac
- Facility to Facility
- Search and Rescue
- Surveillance and Traffic

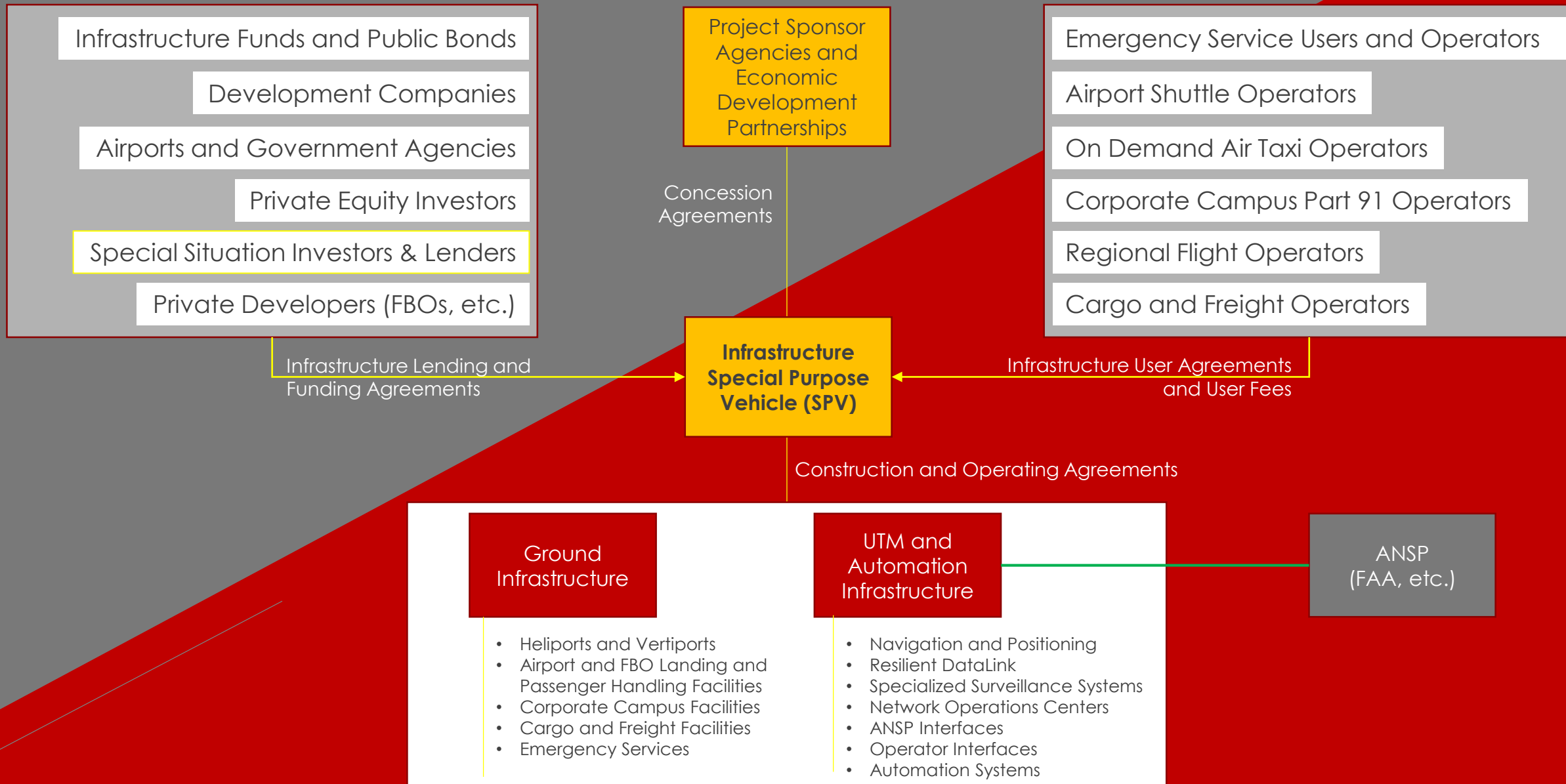
Business Aviation

- Mobility Configurations
- Utilization Strategies
- Benefits
- Shareholder Value

P3 Framework

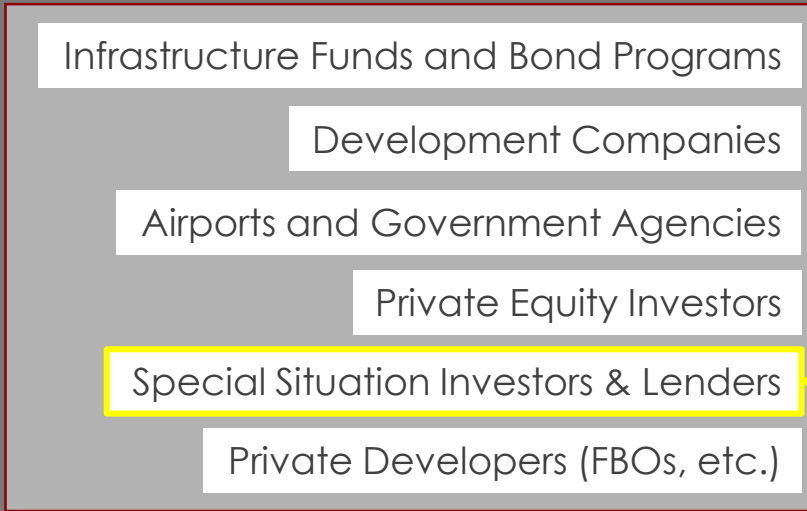
Financial Institutions and Project Lenders

Commercial and Government Users and Operators



P3 Framework

Financial Institutions and Project Lenders



Commercial and Government Users and Operators



Concession Agreements

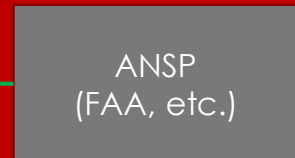
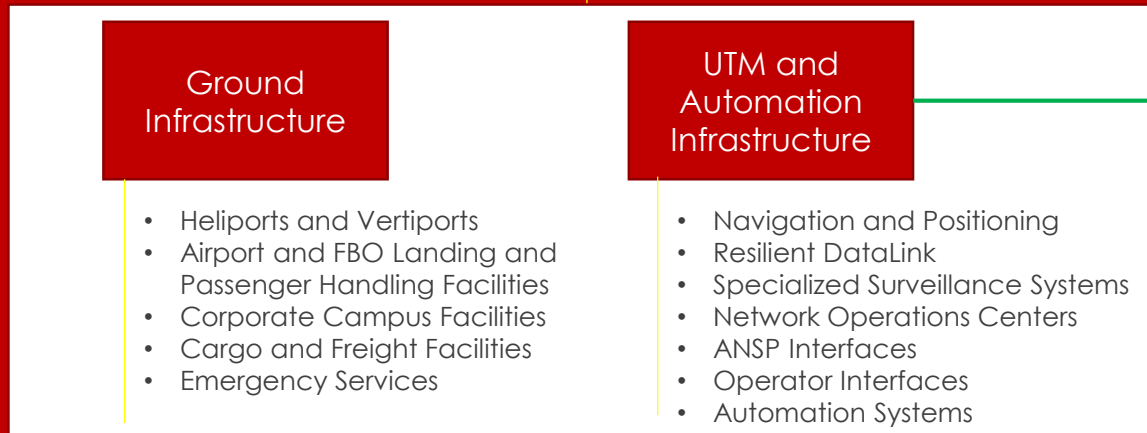
Direct Investment



Infrastructure Lending and Funding Agreements

Infrastructure User Agreements and User Fees

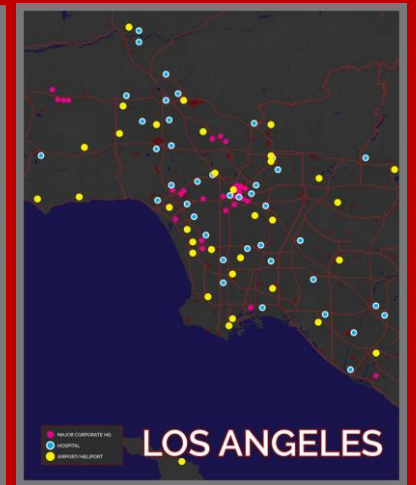
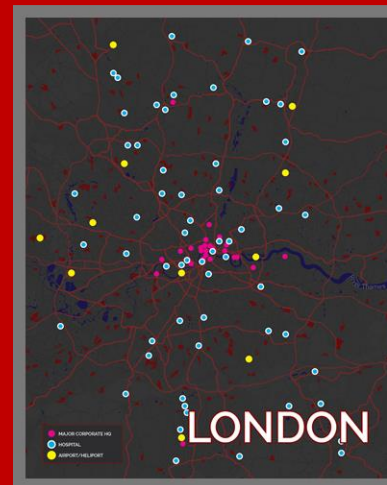
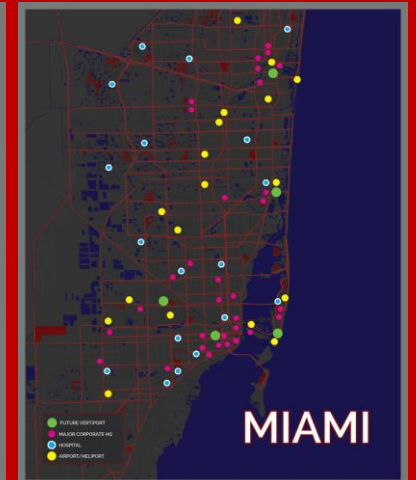
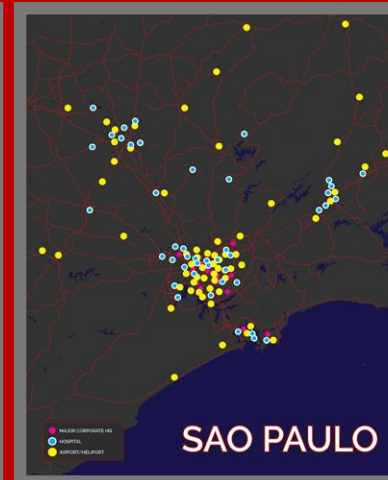
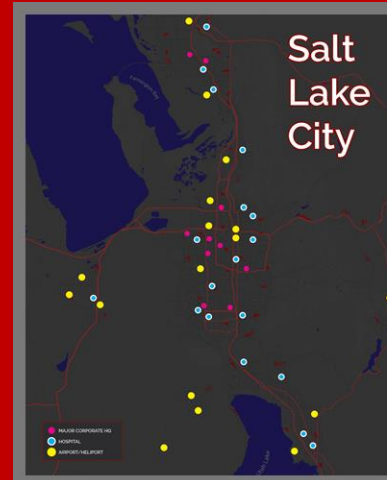
Construction and Operating Agreements



#1 – Select the Most Viable Metropolitan Area(s) for Launch

Must be decided at the city/metro level

- Considerations:
 - Mobility value metrics
 - Existing infrastructure
 - Existing charter helicopter service operators (Part 135)
 - Regulatory obstacles, public perception and ordinances
 - Smart city status, 5G plans
 - Role of early service adopters
 - Corporate head offices and business aviation operators
 - Emergency services operators
 - Etc. Etc.



#2 – Define the Public Benefit, and the Business and Economic Case

Key will be the public perception

- Win-Win means all participants and stakeholders must gain value
- Prepare “Quality of Life” points
- Identify key stakeholders, especially the public, residential areas and businesses
- Frame the business and economic case for UAM in stakeholder terms
- Be prepared to prove case at multiple HUMAN levels



#3 – Build a Trustworthy Coalition to Lead UAM P3 Formation

Seek out experienced P3 talent very early on

- Principles of P3 Success¹:
 - Create a Shared Vision
 - Build Trust as a Core Value
 - Understand Your Partners and Key Players
 - Be Clear on the Risks and Rewards for All Parties
 - Establish a Clear and Rational Decision-Making Process
 - Make Sure All Parties Do Their Homework
 - Secure Consistent and Coordinated Leadership
 - Communicate Early and Often
 - Negotiate a Fair Deal Structure



#4 – Bring Institutional Funds into the Circle as Early as Practicable

Not all funds are created equal

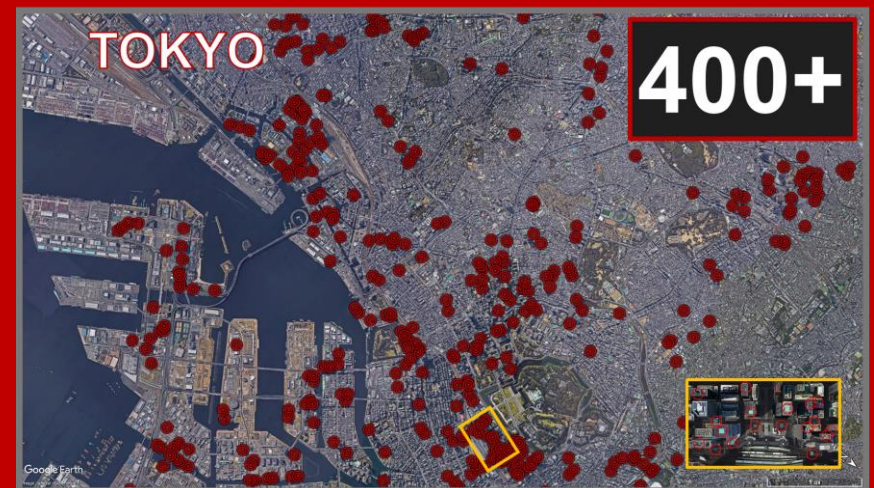
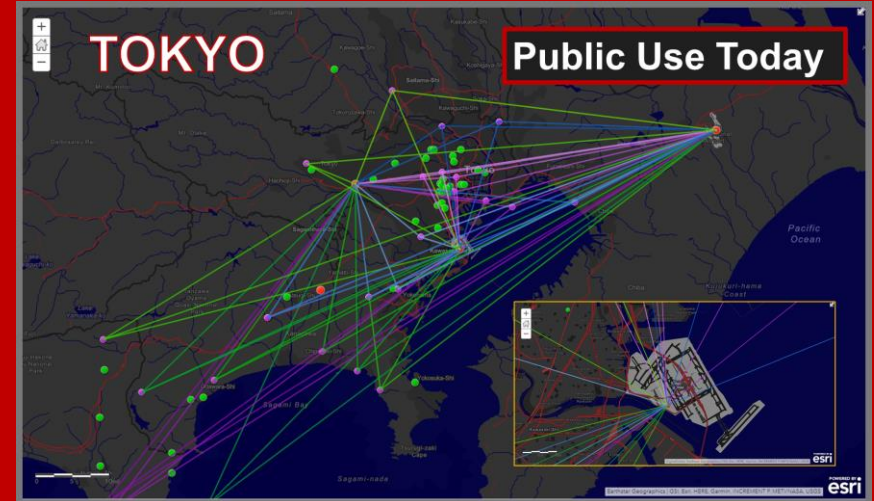
- Top 25 represent well over \$3 Trillion in available capital²
- Every Fund has unique gates and requirements
- Deal-competitive industry
- Risk adverse at same time
- Top criteria or issues:
 - Bond or loan securitization
 - Equity at risk
 - Strong commercial and government partners

	TOP 25 Ranking	Headquarters
1	Macquarie Group	Sydney
2	Brookfield Asset Management	Toronto
3	Global Infrastructure Partners	New York
4	KKR	New York
5	IFM Investors	Melbourne
6	Stonepeak Infrastructure Partners	New York
7	I Squared Capital	Miami
8	Colonial First Asset Management	Sydney
9	Ardian	Paris
10	Energy Capital Partners	Short Hills
11	Amp Capital	Sydney
12	Blackrock	New York
13	KDB Infrastructure Investments	Seoul
14	Antin Infrastructure Partners	Paris
15	EQT	Stockholm
16	Arclight Capital Partners	Boston
17	DIF	Schiphol
18	Copenhagen Infrastructure Partners	Copenhagen
19	Infracapital	London
20	Partners Group	Baar-Zug
21	Hermes GPE	London
22	The Carlyle Group	New York
23	Blackstone	New York
24	American Infrastructure Funds	San Francisco
25	Morgan Stanley Infrastructure	New York

#5 – Invest Early Into Existing Public Airport/Heliport Infrastructure

Path of least resistance

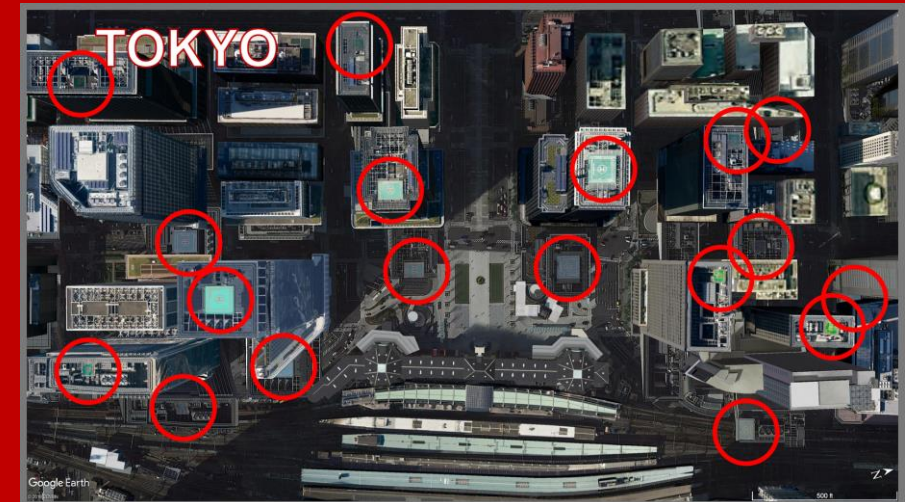
- All 78+ cities being analyzed by NEXA have at least some existing suitable infrastructure
- Considerations include:
 - The city as the opportunity
 - Noise abatement and airspace design
 - Commercial airport facilities and expected UAM passenger volumes
- Obvious partners:
 - Airport FBOs
 - Part 135 operators



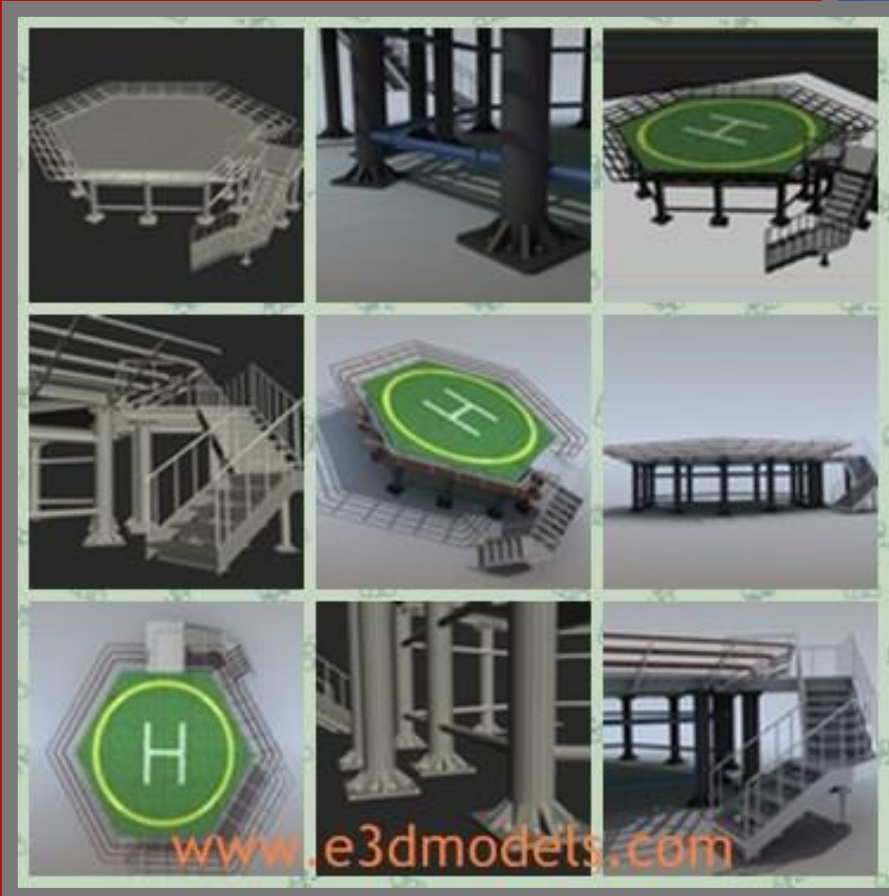
#6 – Develop Incentives for Opt-In Private Airport/Heliport Infrastructure

Path of least resistance

- Considerations include:
 - Location, location, location
 - Attractiveness of direct investment in improvements
 - Revenue and fee sharing
 - Consumer traffic through retail shopping venues
 - Commercial airport facilities and expected UAM passenger volumes
- Partners may include:
 - Corporations
 - Emergency services operators

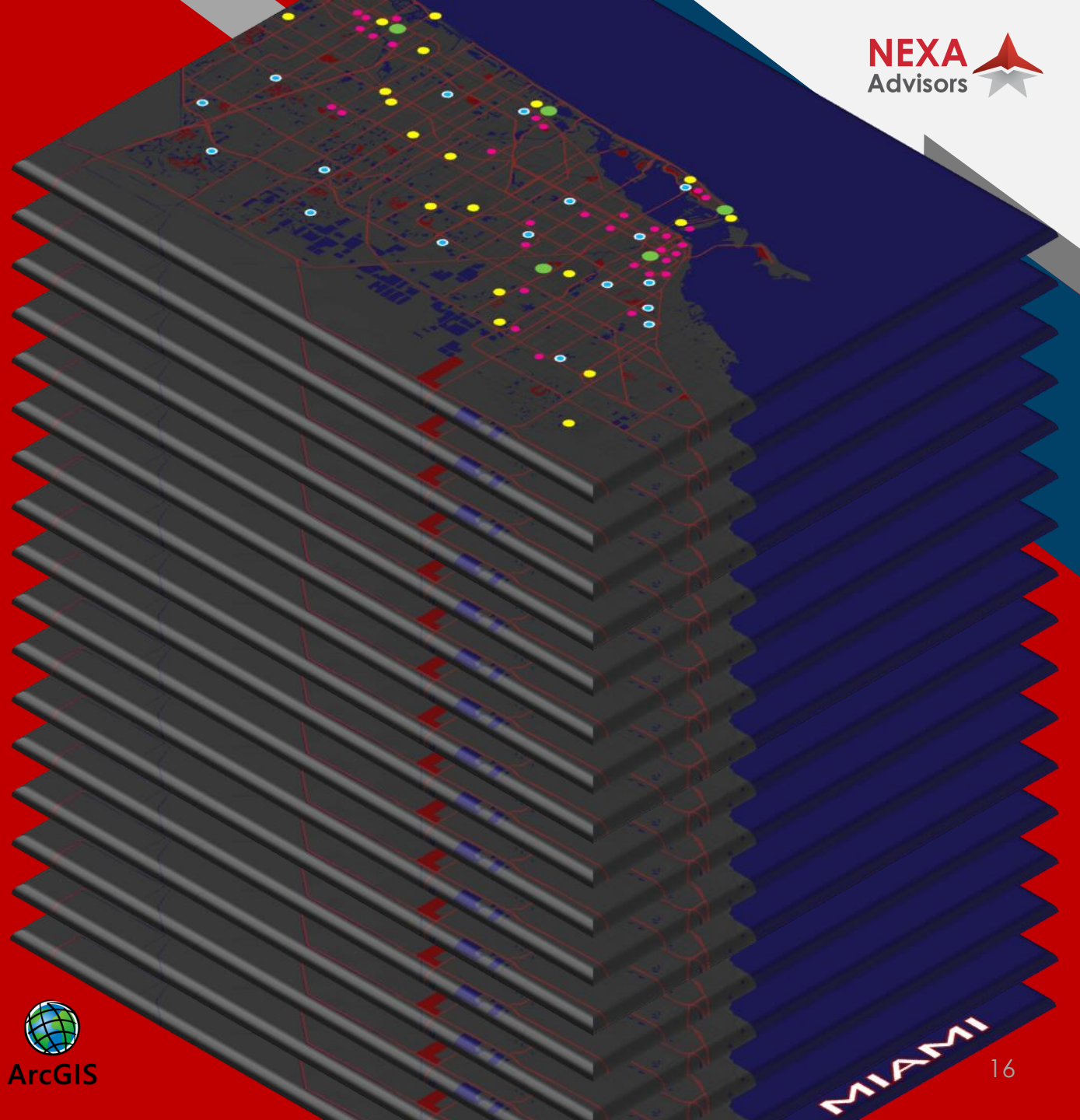


Future UAM Ground Infrastructure



28 Analysis Layers

- | | |
|--|---|
| 1. Hospitals and Emergency Aviation Services | 16. 5G Deployment |
| 2. Commercial Airports | 17. Charter and Part 91 Heli/Fixed Wing Fleet Data |
| 3. GA/Business Airports | 18. Military Bases |
| 4. Major Corporate Headquarters | 19. Existing Airspace Classifications and zoning |
| 5. Train Stations | 20. ANSP Preparations and UTM Integration |
| 6. Heliports/Helipads | 21. Weather Models |
| 7. Congestion Data | 22. Future Airport Infrastructure Projects |
| 8. Light Rail/ Subway Operations | 23. Future UTM Infrastructure |
| 9. Government Centers | 24. Future UAM Vertiports |
| 10. Sporting Arenas | 25. Future UAM Passenger Charter/Part 91 Operations |
| 11. Concert Venues | 26. Future Emergency Services and Operations |
| 12. Shopping Centers | 27. Future Airport Shuttle Services |
| 13. Population Density and Income | 28. Future Air Cargo Operations |
| 14. Job Density | |
| 15. Ferry Operations and Ports | |



**WE ARE CURRENTLY
PROTOTYPING ALL
78+ CITIES TO FIND TOP
CANDIDATES FOR EARLY
INFRASTRUCTURE INVESTMENT**



UAM Study Team

NEXA Capital Partners – Investment bank, NEXA is an advisor to a large syndicate of infrastructure investors.

NEXA Advisors – Research division of NEXA Capital Partners.

UAM - Economics and Global Markets - is a joint undertaking.



Gannett Fleming

*Excellence Delivered **As Promised***





Thank You.



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