



The Business Case for Urban Air Mobility

Geo-Coding the Future of Urban Air Mobility

Presentation to:

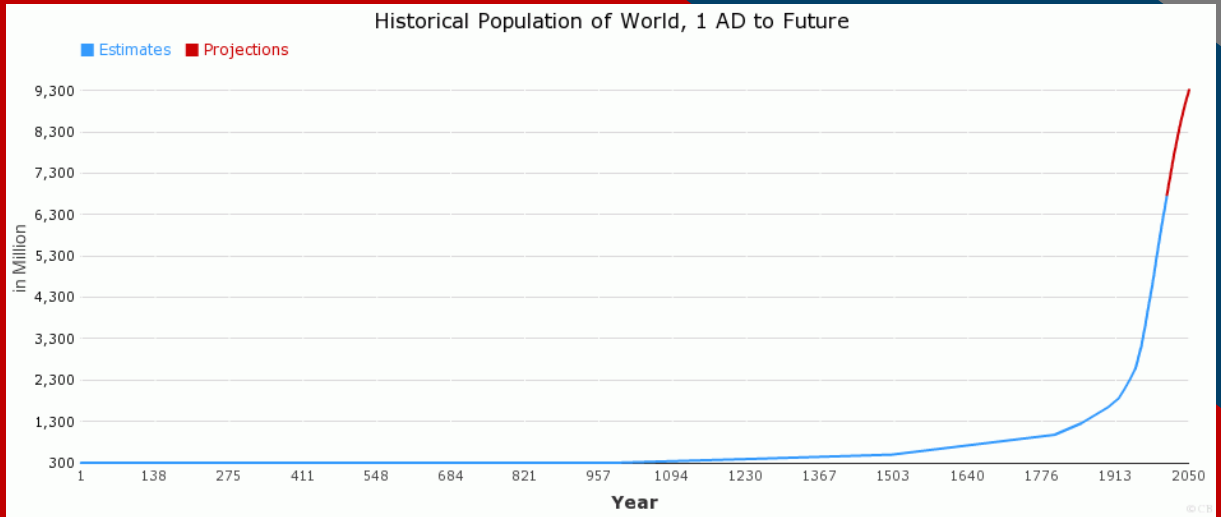


Urban Air Mobility

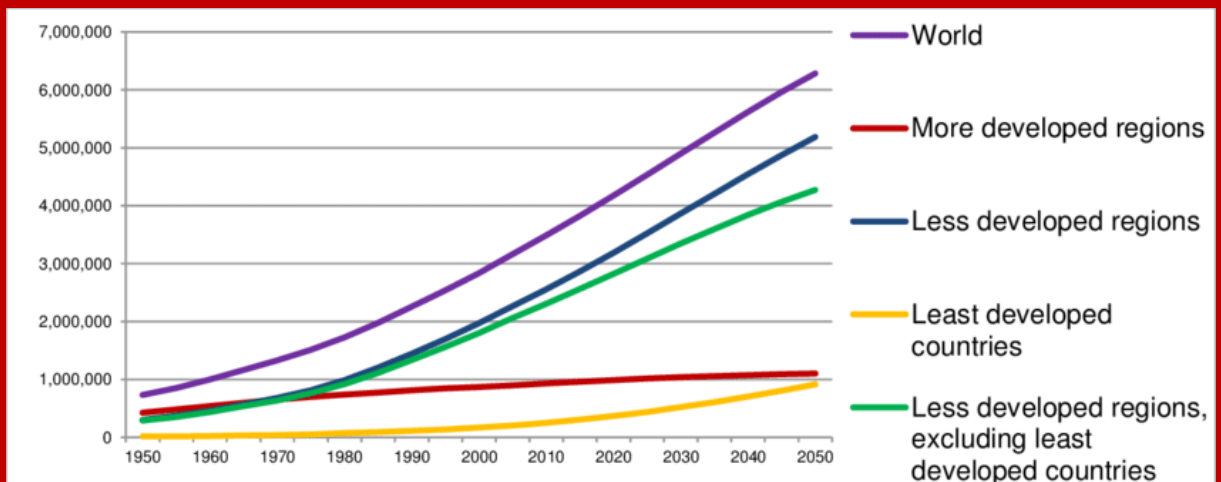
At a Glance

- ❑ According to the UN, the urban population of the world has grown rapidly from 751 million in 1950 to 4.2 billion in 2018.
- ❑ By 2050 over 6 billion people may be living in urban areas.
- ❑ **Congestion:** Mobility of people, delivery of goods and services, quality of life suffer.
- ❑ Urban air mobility has potential to use airspace above cities to restore mobility and decongest city streets.
- ❑ Advancement of aerospace technologies, advanced materials and systems make this possible.

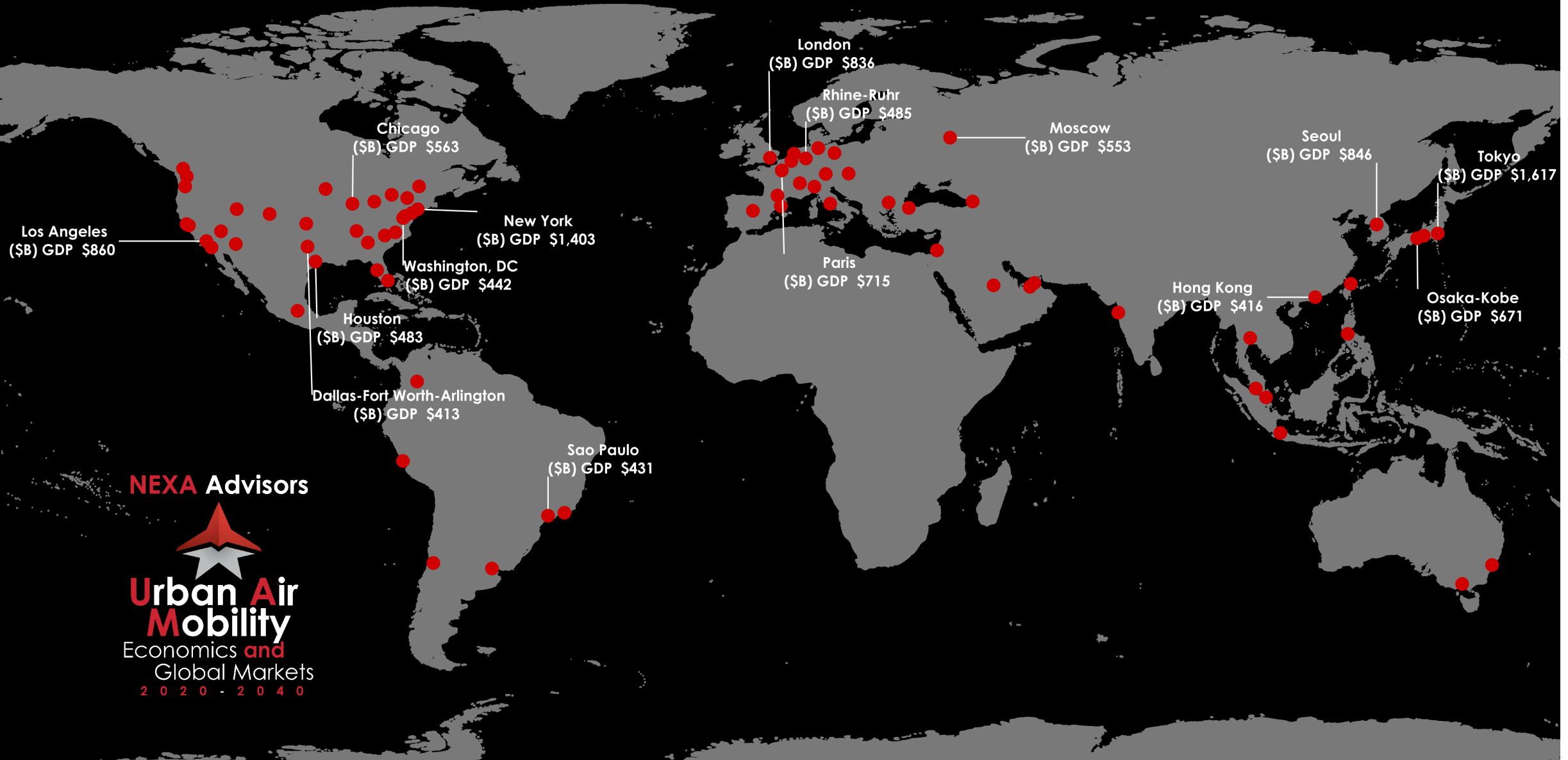
World Population Growth to 2050



Urban Population Forecast to 2050



74 Cities with 15 Largest by GDP Labeled



NEXA Advisors



Urban Air
Mobility

Economics and
Global Markets

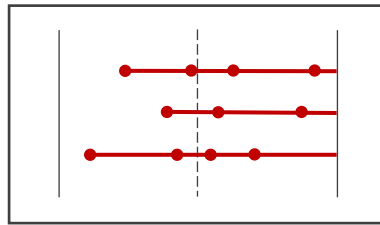
2020 - 2040

Assumptions

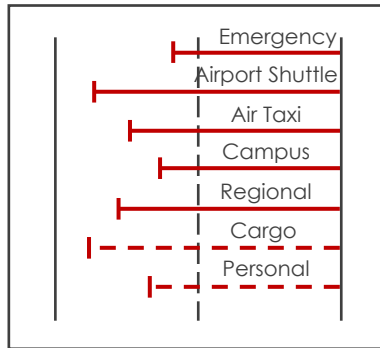
- City Demographics
 - Population and Density
 - GDP per Capita
 - Age Distribution
 - Airline Enplanements
 - Congestion
 - Taxi Fleets and On-Demand
 - Public Transport
 - Emergency Facilities
 - Airports and Heliports
 - Corporate HQs
 - Business Aviation Fleets
- Infrastructure Costs
 - Nominal Verti/Heliport Facilities
 - Passenger Handling
 - UATM Systems
 - ANSP Interfaces
- Vehicle & Supply Chain
 - OEM Fleets
 - Electric/Hybrid/Hydrogen
 - Battery and Charging
 - Power Grid
 - Supply Chain and MRO
- Demand Assumptions
 - Phasing
 - Pricing
- Regulatory and Community Constraints
 - Noise
 - Safety
 - Public Perception

Analytical Drivers

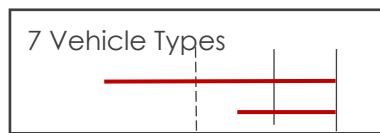
Ground Infrastructure



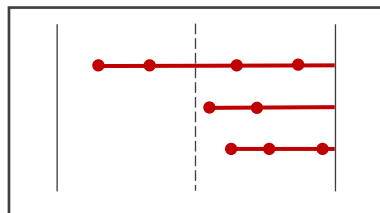
UAM Service Demand



UAM eVTOL Supply Chain

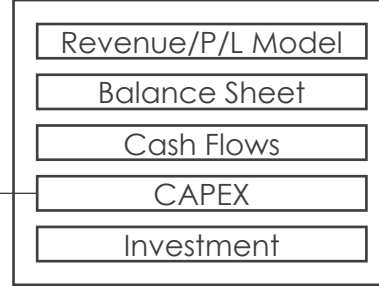


UATM Infrastructure

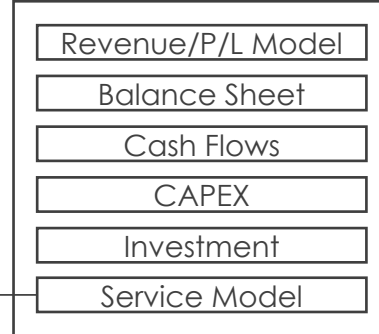


Modeling and Analysis

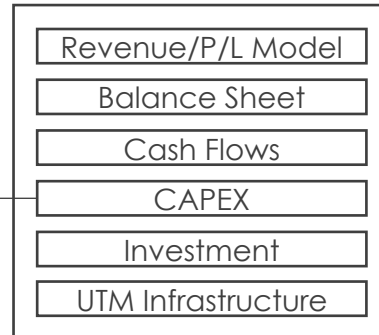
City PPP Model



UAM Operating Model

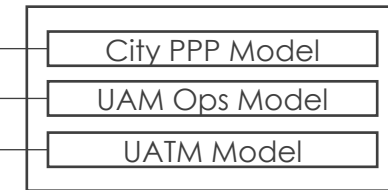


UATM Model



Outputs

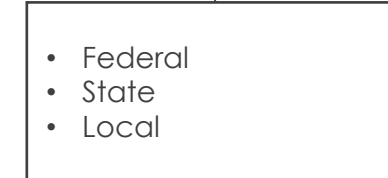
Dashboard



Econometrics



Tax Revenues



Findings

- Viability
 - Fundability
 - Affordability
 - Public Acceptance
- What is the outlook for 74 of the most significant metropolitan areas globally, and what policy, technology, and financial issues will individually define success?
- What will be the plan, and the minimum investment to move these urban areas to the tipping point of success?
- What is the expected size of UAM markets over the next 20 years, but especially the next 5?
- ### Emergency Services
- Medivac
 - Facility to Facility
 - Search and Rescue
 - Surveillance and Traffic
- ### Business Aviation
- Mobility Configurations
 - Utilization Strategies
 - Benefits
 - Shareholder Value

UAM Financial/Economic Tools



UAM Geomatics, LLC
A NEXA Capital Company

Operator Markets for UAM

74 Cities ranked by GDP

We Analyzed Five Services...

- Airport Shuttle
- On Demand Air Taxi
- Business Campus/Office
- Regional (>300KM) On Demand
- Medical/Emergency

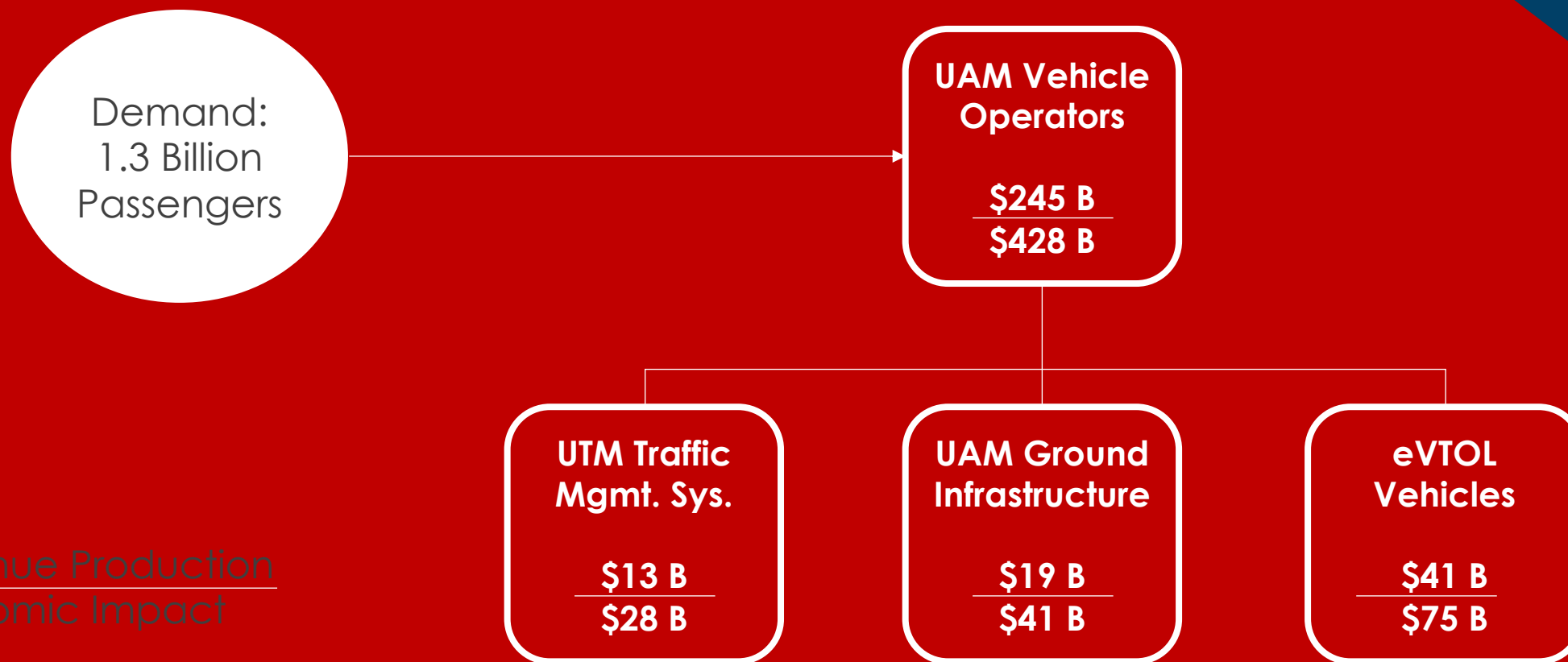
...and We Side-Stepped Six...

- UAM Markets Outside the 74 Cities
- Cargo, Freight Applications
- New Business Models for Part 121 Operators
- Military Apps and Opportunities
- Recreational/Tourism
- Exotic Niches (Personal Travel, Etc.)



Global UAM Market Forecast

74 Cities Between 2020 – 2040 (In USD\$)



Key:

Revenue Production
Economic Impact

The Inflection Point for UAM

Pre-Automation

2020

- ❑ Critical to the design, launch and public acceptance of the UAM industry
- ❑ Standards will emerge on safety, resiliency, interoperability, geofencing, noise
- ❑ Proving ground for manufacturers to refine design, demonstrate technologies and new fuels such as hydrogen
- ❑ Nascent markets will appear city by city
- ❑ P135 operators will introduce eVTOL working with ANSPs and cities in “business as usual” models

Transition

2030



Post Automation

2040

- ❑ Industry adoption of standards will facilitate and accelerate market growth
- ❑ Manufacturers must succeed in logging hundreds of thousands of safe flight hours
- ❑ Safe levels of flight automation demonstrated
- ❑ Ground infrastructure reaches minimum scale
- ❑ Integration of sUAS, UAM-eVTOL and commercial operations with advanced UATM systems
- ❑ Passenger fares fall with increased demand

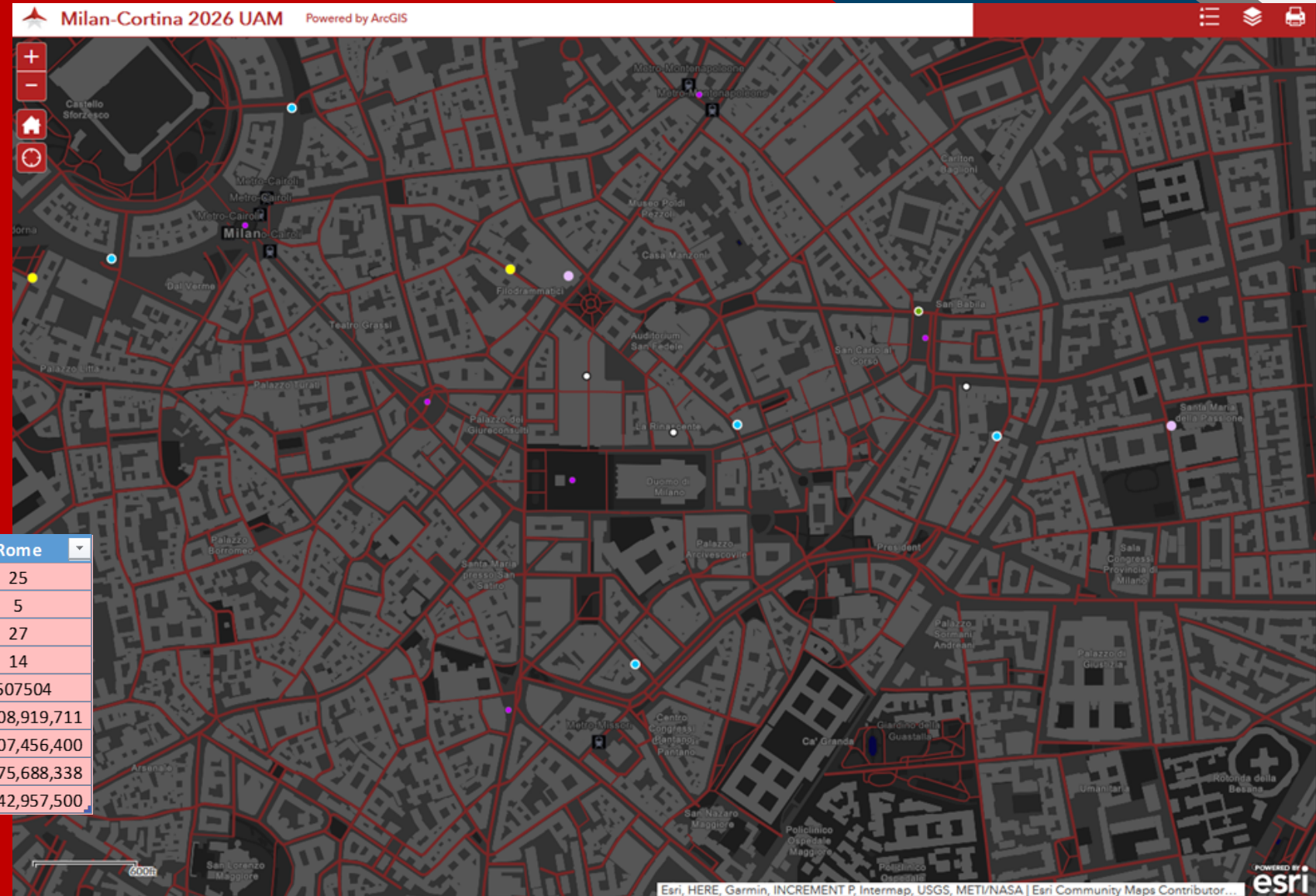
UAM/UATM ArcGIS Toolset



Geo-Coded data includes: Heliports (existing and future), F1000 HQ Locations, Business Aviation Fleets

Milano

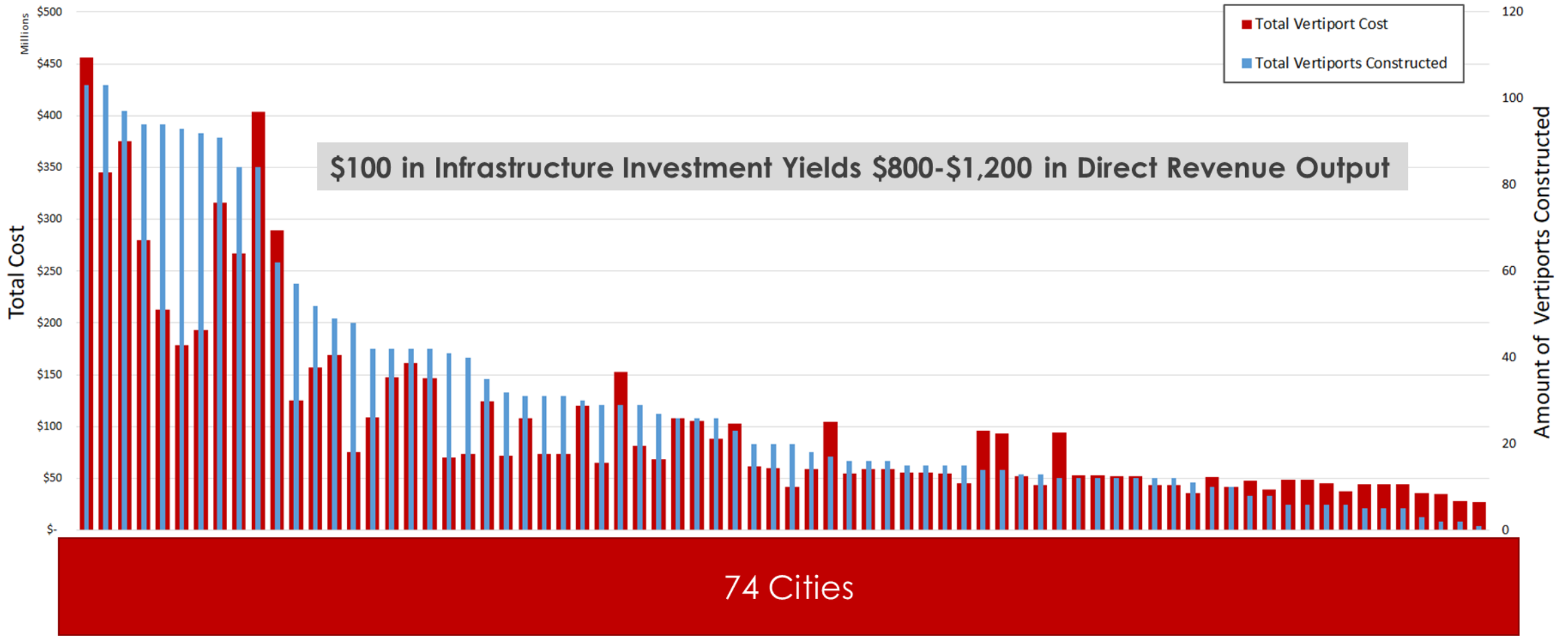
- ❑ Milan promises over \$1.88 billion of future eVTOL operator revenue.
- ❑ Combined infrastructure investment to realize such opportunity, including UATM operations, is \$184 million.



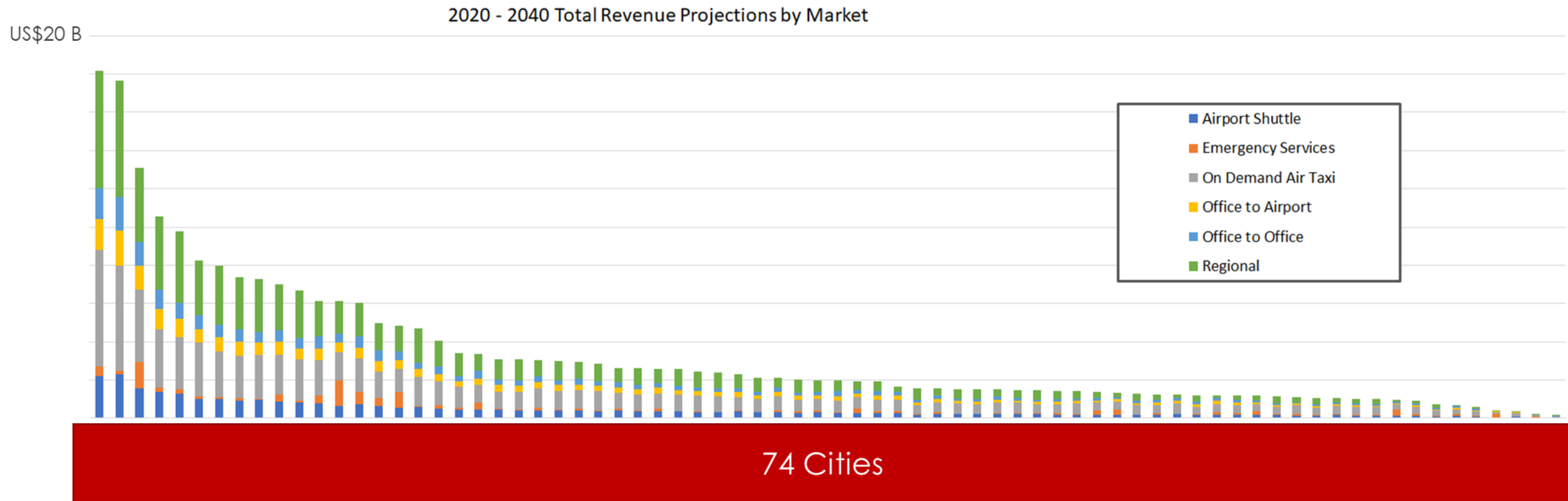
	Milan	Rome
Existing Heliports - City Core	15	25
Total Airports	5	5
Projected New Vertiports - City Core	14	27
Total Hospitals	30	14
Total Passengers in 2040 (Final Year)	1063321	1507504
Total Operator Revenues 2020-2040	\$ 1,880,812,734	\$ 2,508,919,711
Total Infrastructure Costs (2020-2040)	\$ 95,674,800	\$ 107,456,400
Total UATM Costs (2020-2040)	\$ 88,462,059	\$ 75,688,338
Total eVTOL Vehicle Costs (2020-2040)	\$ 312,498,750	\$ 442,957,500

UAM Infrastructure Investment (2020-2040)

Constructed Vertiport Total & Cost



Forecasted UAM Passenger Revenue



Example - Tokyo (2020-2040): \$18.1 Billion Operator Revenues



Thank You!

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