



# The Georgia Tech Center for Urban and Regional Air Mobility (CURAM)

**Laurie A. Garrow**  
Associate Director, CURAM  
School of Civil and Environmental Engineering

CREATING THE NEXT®



## Urban Air Mobility (UAM) Defined

Urban Air Mobility (UAM) is an emerging market for transporting people and goods in cities and regions by air.

Will be realized by new aircraft that are (1) automated or autonomous, (2) have batteries and electric motors for propulsion, and (3) are capable of vertical/short takeoff and landing.

Will be managed in a network operation that interfaces with the airspace in cities and is optimized for low costs, low community noise, and high levels of safety.

**As cities become more congested, UAM offers the value proposition of significant time savings compared to driving.**



Credit: NASA

## What Is Different About UAM?



### Almost everything!

- User experience: “Air taxis,” goods delivered on-demand
- Aircraft technology: Electric VTOL (eVTOL), autonomous flight
- Operations and infrastructure: Vertiports, airspace management
- Public policy and regulation: City planning, certification

# eVTOL Aircraft Under Development



Volocopter

€30m investment from Intel & Daimler



Zee Aero / Kitty Hawk

\$100m+ investment from Larry Page



Airbus Vahana



Joby S4

\$100m investment from Intel, Toyota, JetBlue



Aurora Flight Sciences / Boeing



Lilium

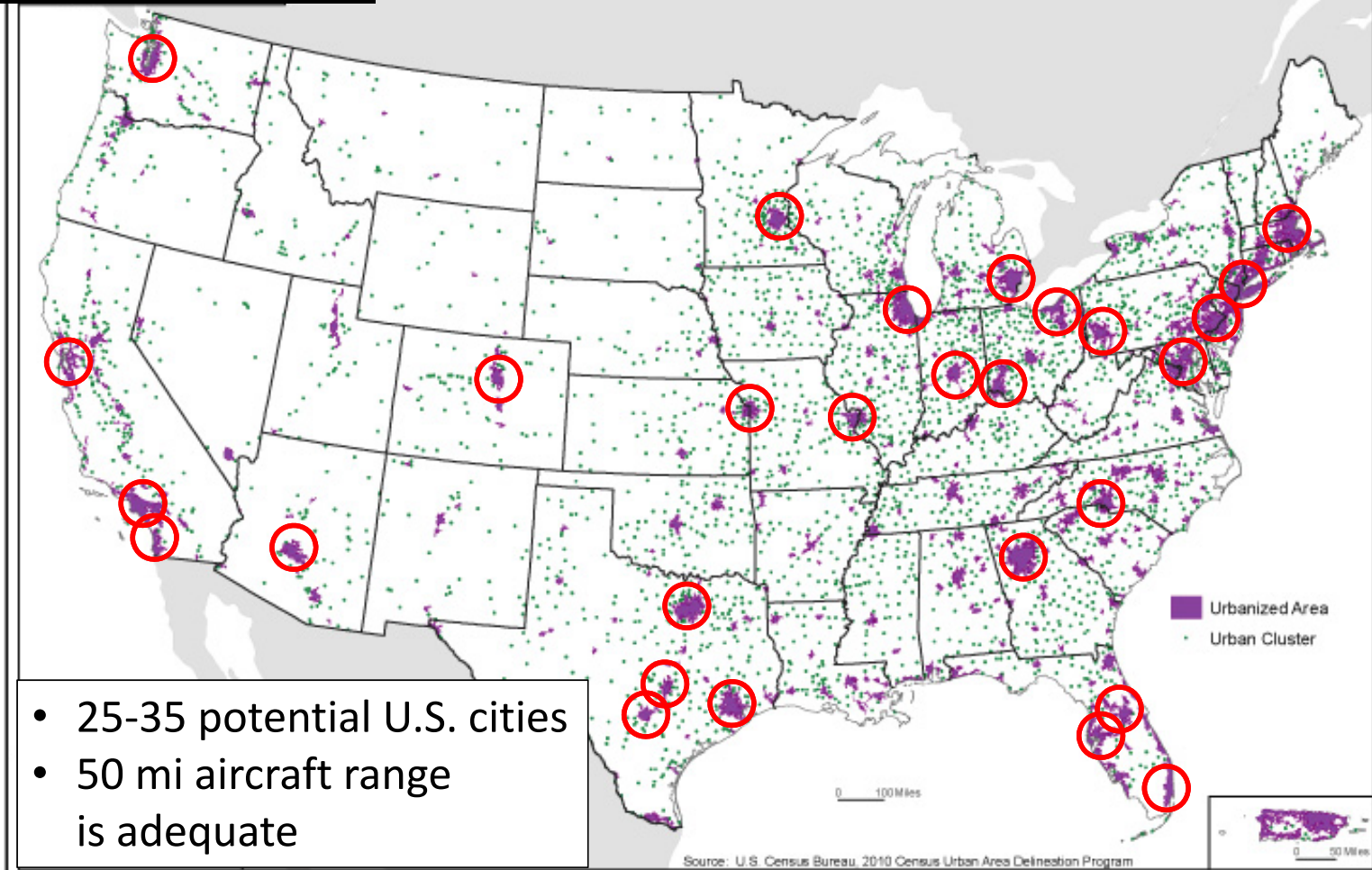
\$100m investment from Tencent & Atomico

CREATING THE NEXT®

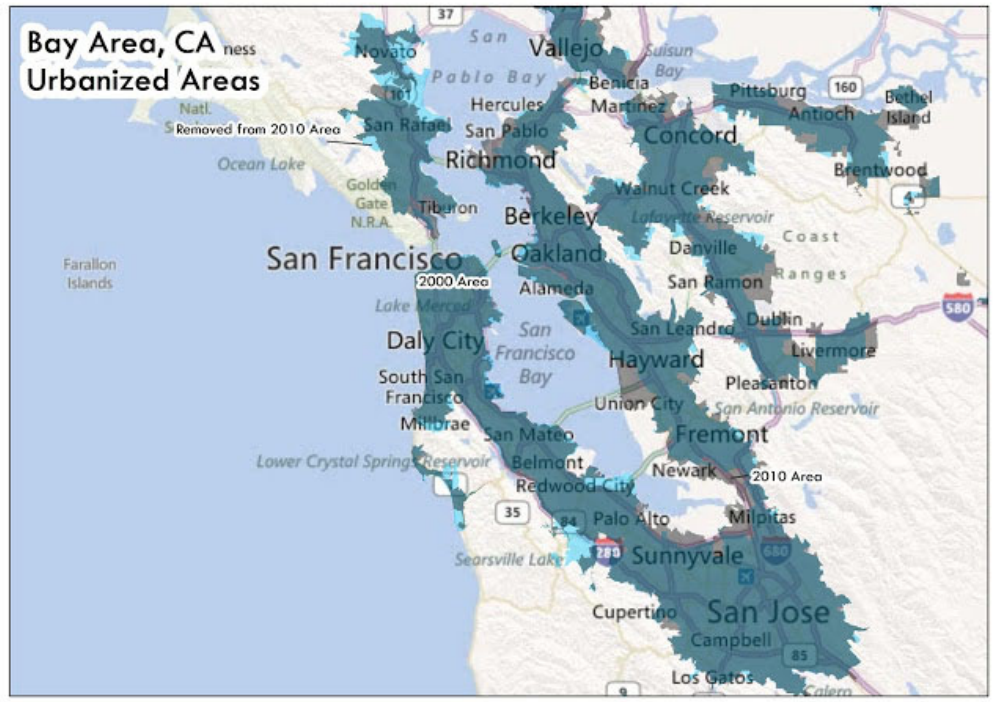
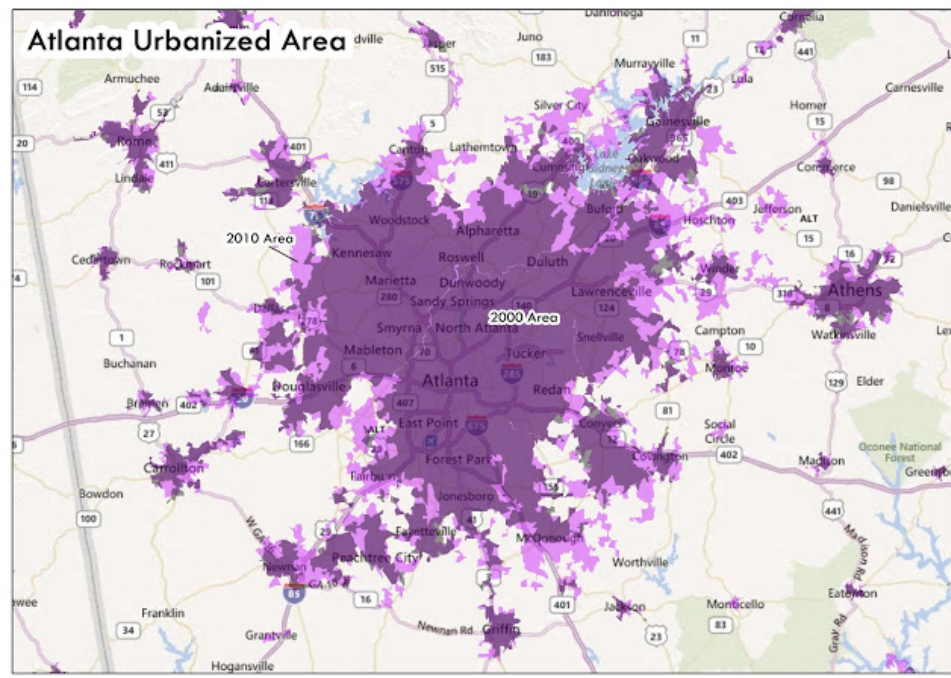


## Potential U.S. UAM Markets

### Urbanized Areas and Urban Clusters: 2010



But Every City is Different!

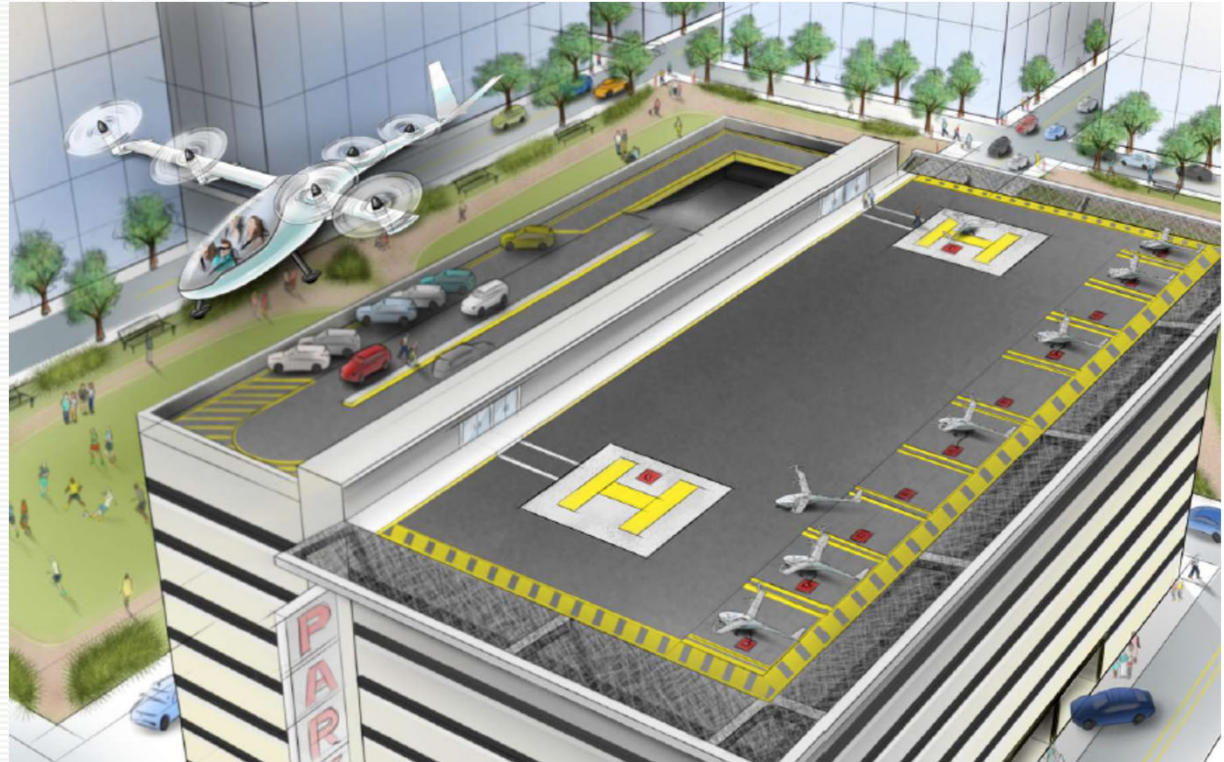
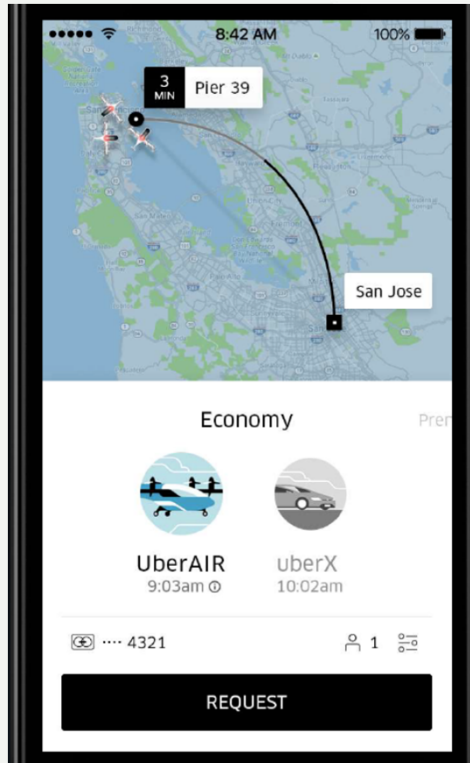


Different urban morphologies, population distributions, local regulatory frameworks, and airspace constraints imply differences in aircraft design and operational requirements





# UAM and “Mobility as a Service” in Smart Cities



“On-Demand Ridesharing: The Next Commercial Aviation Market”—plenary talk by Mark Moore, Director of Aviation at Uber, at the AIAA Aviation Forum 2017

VIDEO BY UBER AIR



[https://www.youtube.com/watch?v=JuWOUEFB\\_IQ](https://www.youtube.com/watch?v=JuWOUEFB_IQ)

CREATING THE NEXT®



## The Georgia Tech Center For Urban And Regional Air Mobility (CURAM)



We have formed the Georgia Tech Center for Urban and Regional Air Mobility (CURAM) to serve as a focal point to integrate expertise across the engineering disciplines and from experts in policy, economics, and business.

Our mission is threefold:

- (1) to research safe, desirable, sustainable, and equitable means of urban and regional air transportation, at scale,
- (2) to educate the workforce that will build and operate this future of aviation, and
- (3) to explore the economic opportunity of urban and regional aviation for Atlanta, Georgia, the U.S., and the world.

[HTTPS://AIRMOBILITY.GATECH.EDU](https://airmobility.gatech.edu)



At Georgia Tech,  
we envision a future where

» we electrify our transportation system to allow vehicles to return energy to the grid.

» autonomous technologies blur the lines between ground and air transportation.

» air taxis seamlessly integrate with self-driving cars to better connect individuals with employment and medical centers.

» robotic landing gear allows us to safely land drones and air taxis in difficult terrain and weather conditions.

» an integrated freight delivery system uses large drones to bypass traffic congestion, land on the roofs of delivery trucks, and resupply the trucks.

» robust modeling and simulation tools help us develop control algorithms that provide favorable handling qualities and control performance for new aircraft designs.

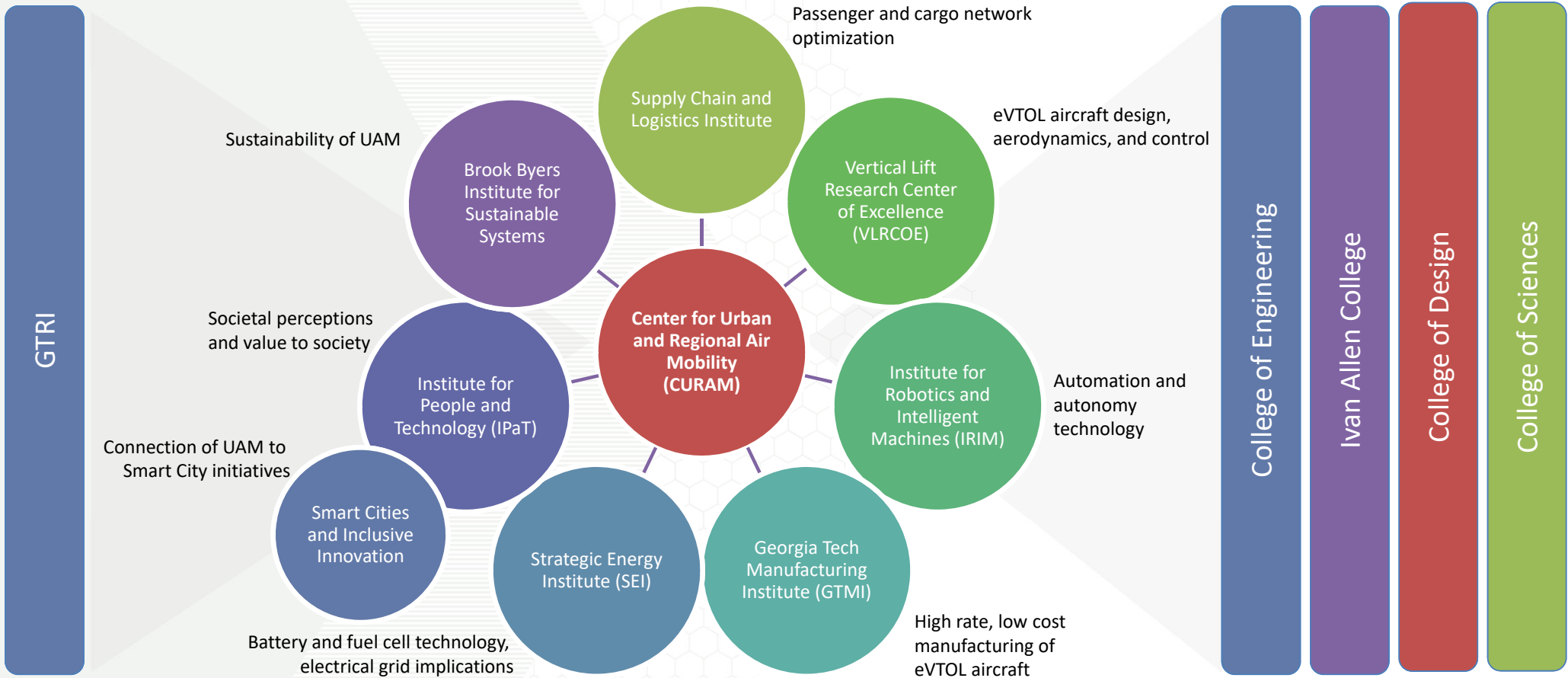
» the batteries we use to power aircraft are reasonably priced, durable, and carbon-neutral.

» we use 3D printing to quickly prototype aircraft designs.

» our aircraft and air traffic control systems are highly automated yet seamlessly integrated with human decision-making.

CREATING THE NEXT®

# CURAM Focuses Georgia Tech on UAM



GTRI

Sustainability of UAM

Brook Byers Institute for Sustainable Systems

Supply Chain and Logistics Institute

Passenger and cargo network optimization

Vertical Lift Research Center of Excellence (VLRCOE)

eVTOL aircraft design, aerodynamics, and control

Societal perceptions and value to society

Institute for People and Technology (IPaT)

Center for Urban and Regional Air Mobility (CURAM)

Institute for Robotics and Intelligent Machines (IRIM)

Automation and autonomy technology

Connection of UAM to Smart City initiatives

Smart Cities and Inclusive Innovation

Strategic Energy Institute (SEI)

Georgia Tech Manufacturing Institute (GTMI)

High rate, low cost manufacturing of eVTOL aircraft

Battery and fuel cell technology, electrical grid implications

College of Engineering

Ivan Allen College

College of Design

College of Sciences

CREATING THE NEXT®



## Kickoff Event and Current Activities



- CURAM's first event, **Urban and Regional Air Mobility: An Opportunity for Georgia**, was held on January 23, 2019
  - Co-sponsored by the Metro Atlanta Chamber, Georgia Chamber, and Georgia Centers of Innovation
  - ~ 100 attendees
  - Keynote by Mark Moore from Uber, national, state and local panels to introduce UAM (Thank you to Carol Comer!)
  - Focus on UAM opportunities for our city/region
- **Current activities**
  - Conducting research in UAM demand modeling, aircraft design, and operations
  - Pursuing multi-investigator funding opportunities

## Contact Information



- Laurie Garrow, Associate Director of CURAM [laurie.garrow@ce.gatech.edu](mailto:laurie.garrow@ce.gatech.edu)
- Brian German, Director of CURAM [brian.german@aerospace.gatech.edu](mailto:brian.german@aerospace.gatech.edu)