



ADVANCED AIR MOBILITY: INTEGRATING THE THIRD DIMENSION INTO OUR TRANSPORTATION SYSTEMS

Washington Airport Management Assn
Annual Conference
October 6, 2021



Supporting the responsible integration of the third dimension into our daily transportation needs through education, communication, and collaboration.

CAMI is a 501(c)(3) nonprofit organization dedicated to the responsible integration of advanced air mobility into communities by providing education, communication, and collaboration.

CAMI understands the importance of connecting communities and industry by working with all stakeholders to develop advanced air mobility that integrates with existing and future urban and regional transportation systems.

CAMI educates and equips state and local decision makers, planners, and the public with the information they need to set policies and design infrastructure and systems to successfully integrate aviation into daily transportation options.



TECHNOLOGY IS REDEFINING FLIGHT

Courtesy of Radius Capital

Tech Drivers

Propulsion
Electrification

Autonomous
Systems

Mobility Services

New Capabilities



eVTOL



Electric and
Hybrid-electric

Solution Areas

Moving goods

Moving people

Automating tasks

Thematic Benefits

- Lowers the barriers for leveraging UAVs to get jobs done
- Lowers the operating cost of small aircraft on short routes
- Increases the number of access points to the air
- Stimulates latent demand for flight where ground transportation is used today

Definition of AAM

AAM is a broad concept focusing on emerging aviation markets and use cases for on-demand aviation in urban, suburban, and rural communities. AAM includes local use cases of about a 50-mile radius in rural or urban areas and intraregional use cases of up to a few hundred miles that occur within or between urban and rural areas.

Urban Air Mobility: History, Ecosystem, Market Potential, and Challenges

<https://escholarship.org/uc/item/8nh0s83q>

Urban Air Mobility: Statistics

The aviation industry will develop, build and deliver an air taxi faster than most cities can build a new highway.

- UAM industry projected to be \$1.9+T by 2040, making it the single largest new industry to emerge this generation (Morgan Stanley research)
- Hybrid-electric aviation travel industry could reach \$178B by 2028 (UBS)
- Estimated total investment to date is \$5B
- In 2017 there were 12 known companies developing eVTOL aircraft. Today there are at over 400 eVTOL aircraft concepts, with a dozen in the process of FAA certification
- In 2019 alone, there were over 1,000 test flights of full size eVTOL aircraft.
- We anticipate the first low volume operations by 2023, reaching commercially scaled volumes by 2028.

Automotive OEMs Going Vertical

Pulse by Maeil Business Newspaper

print

Hyundai Motor, Urban-Air Port to jointly build UAM stations in UK

2020.08.07 13:36:04 | 2020.08.07 14:34:15



[Photo by Kim Jae-hoon]

Daimler invests in flying taxi firm Volocopter

REUTERS
Aug 1st 2017 at 8:10AM

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comments



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TOYOTA



PORSCHE

HYUNDAI
MOTOR GROUP



TESLA



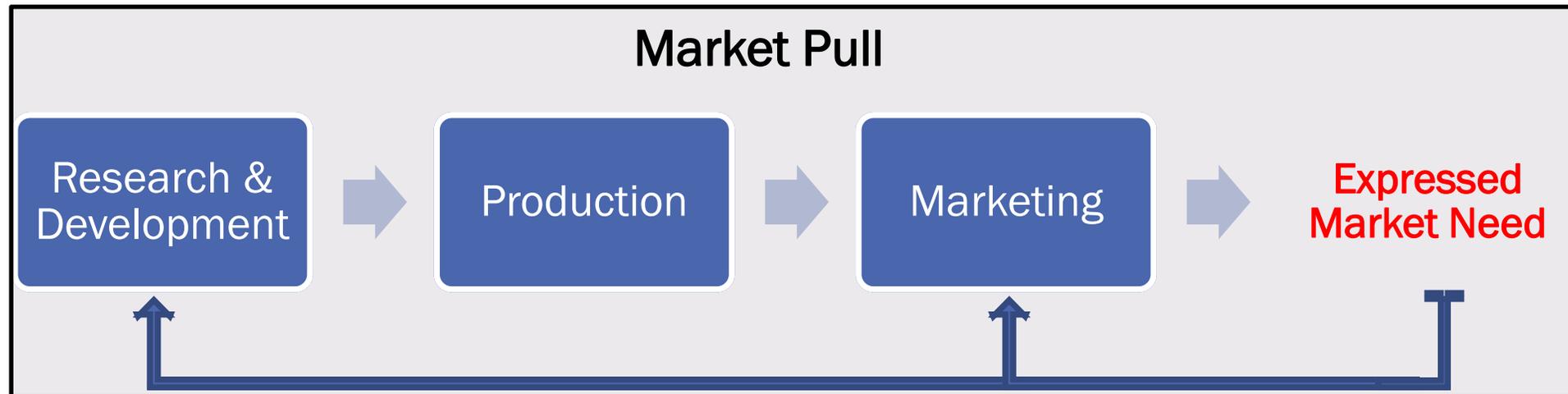
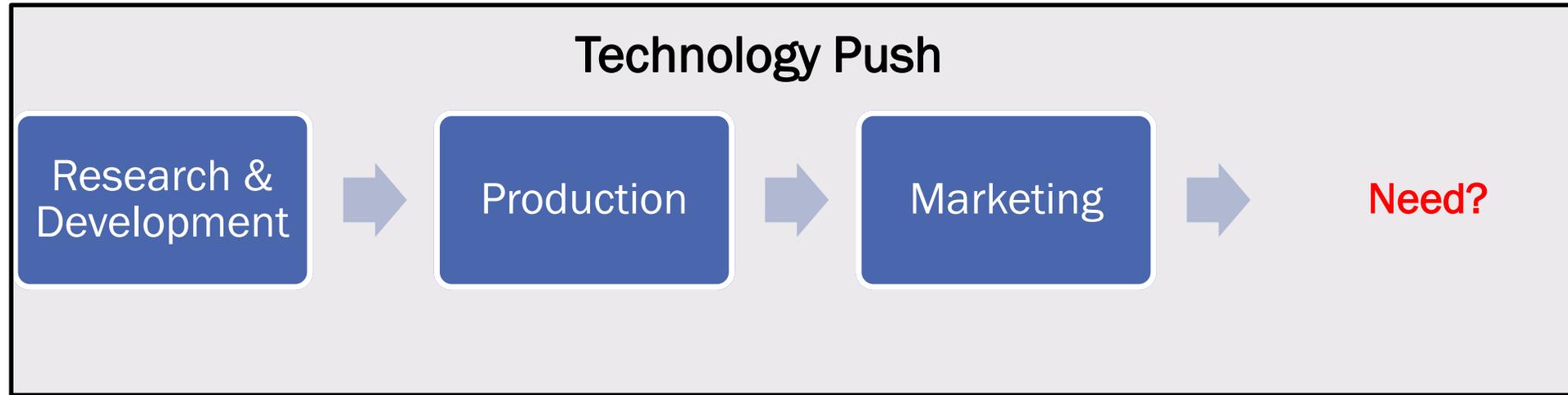
Mercedes-Benz



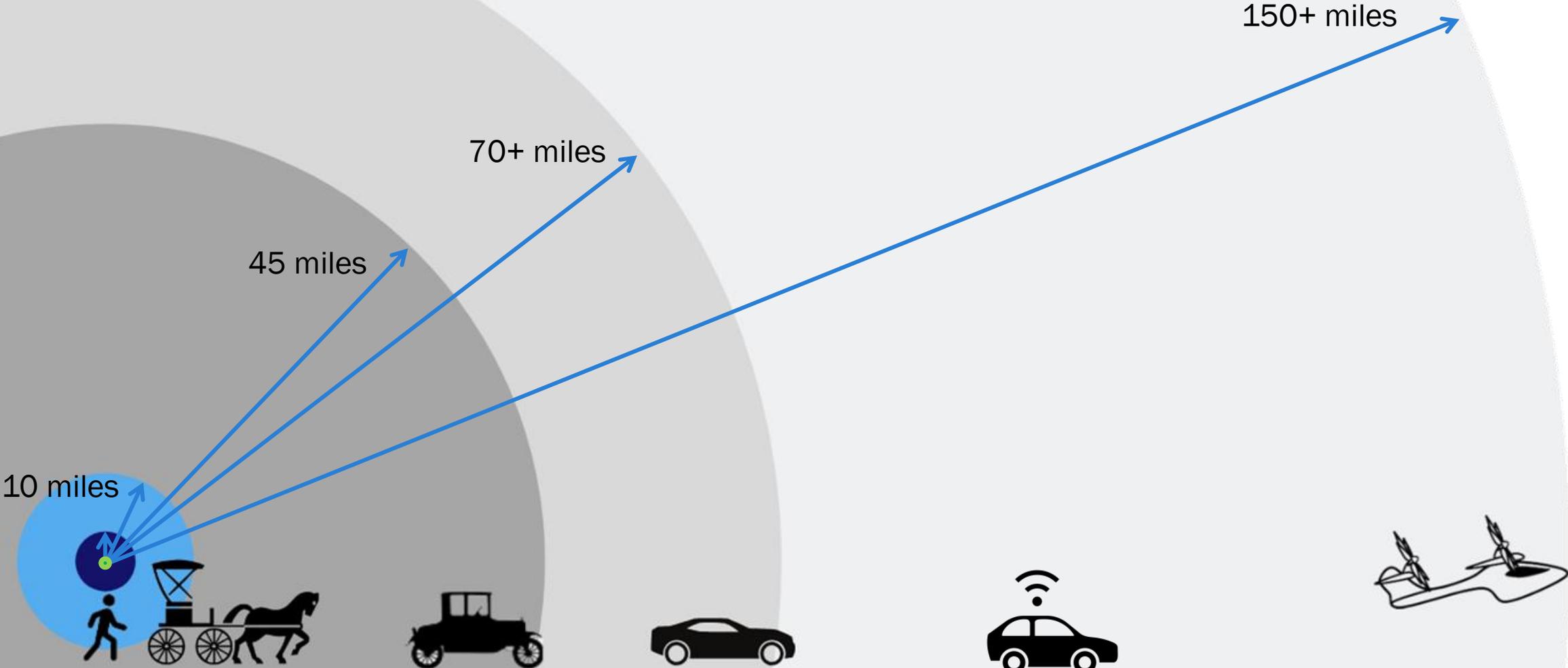
吉利汽车
GEELY AUTO

HONDA
The Power of Dreams

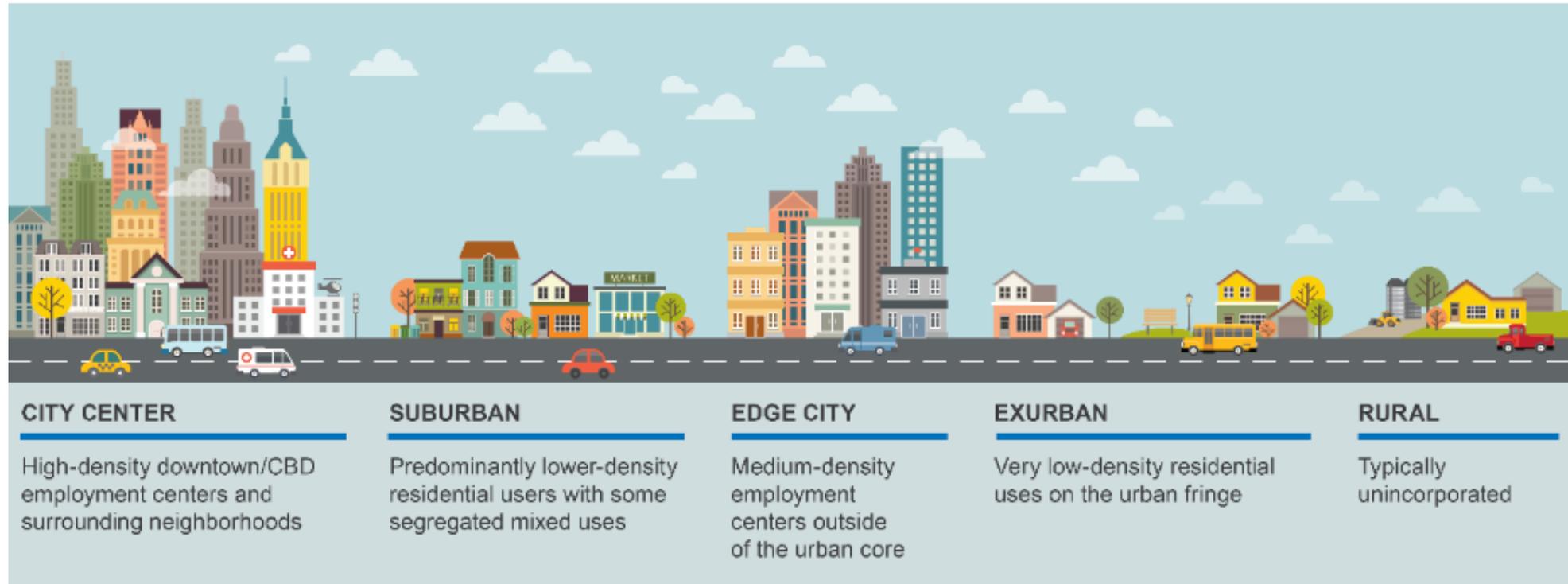
AAM: Technology Push vs Market Demand Pull



Marchetti's Constant



Built Environment



Emergency Services

- Disaster response
- Aeromedical
- Firefighting
- Law enforcement



Image: Creative Commons Piqsels

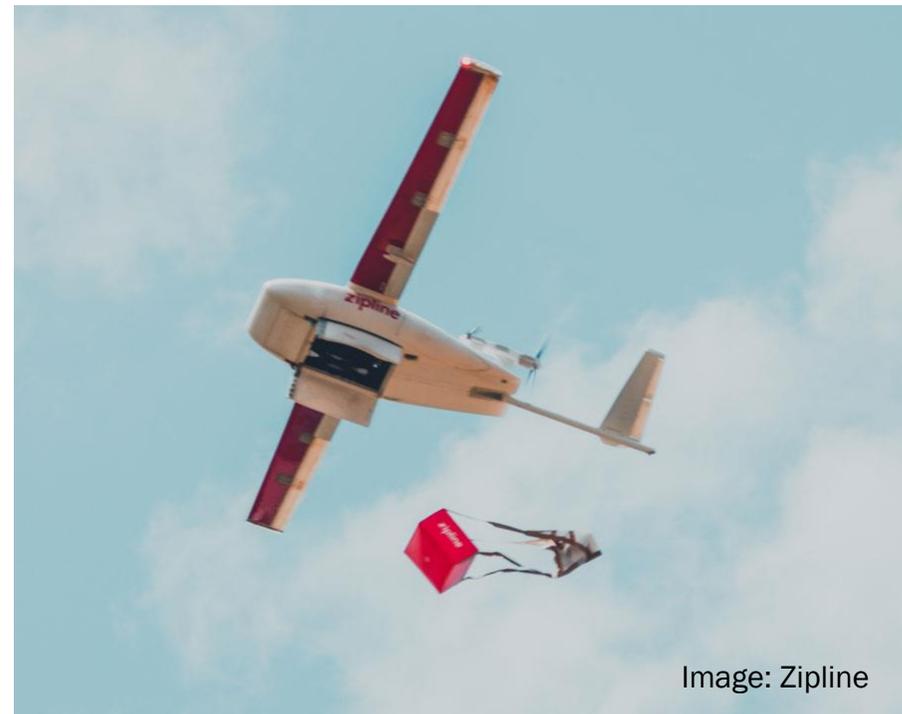


Image: Zipline

Air Taxi

- On demand, point-to-point
- App-based like transportation network companies / ride hailing services.



Image: NASA

Air Metro

- Fly a specified route on a specified frequency but without exact scheduled times
- Potential strategy to serve transportation deserts

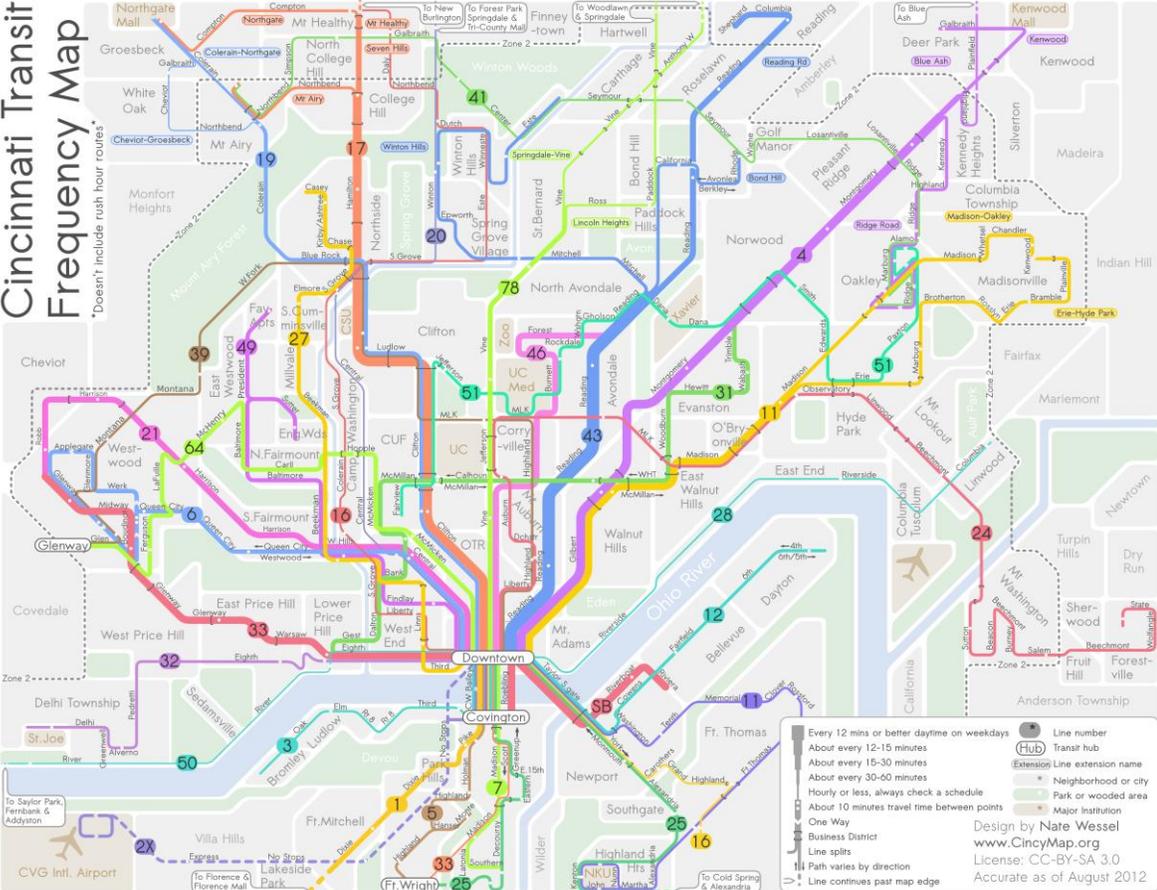


Image: Cincinnati Bus Diagram from 2011

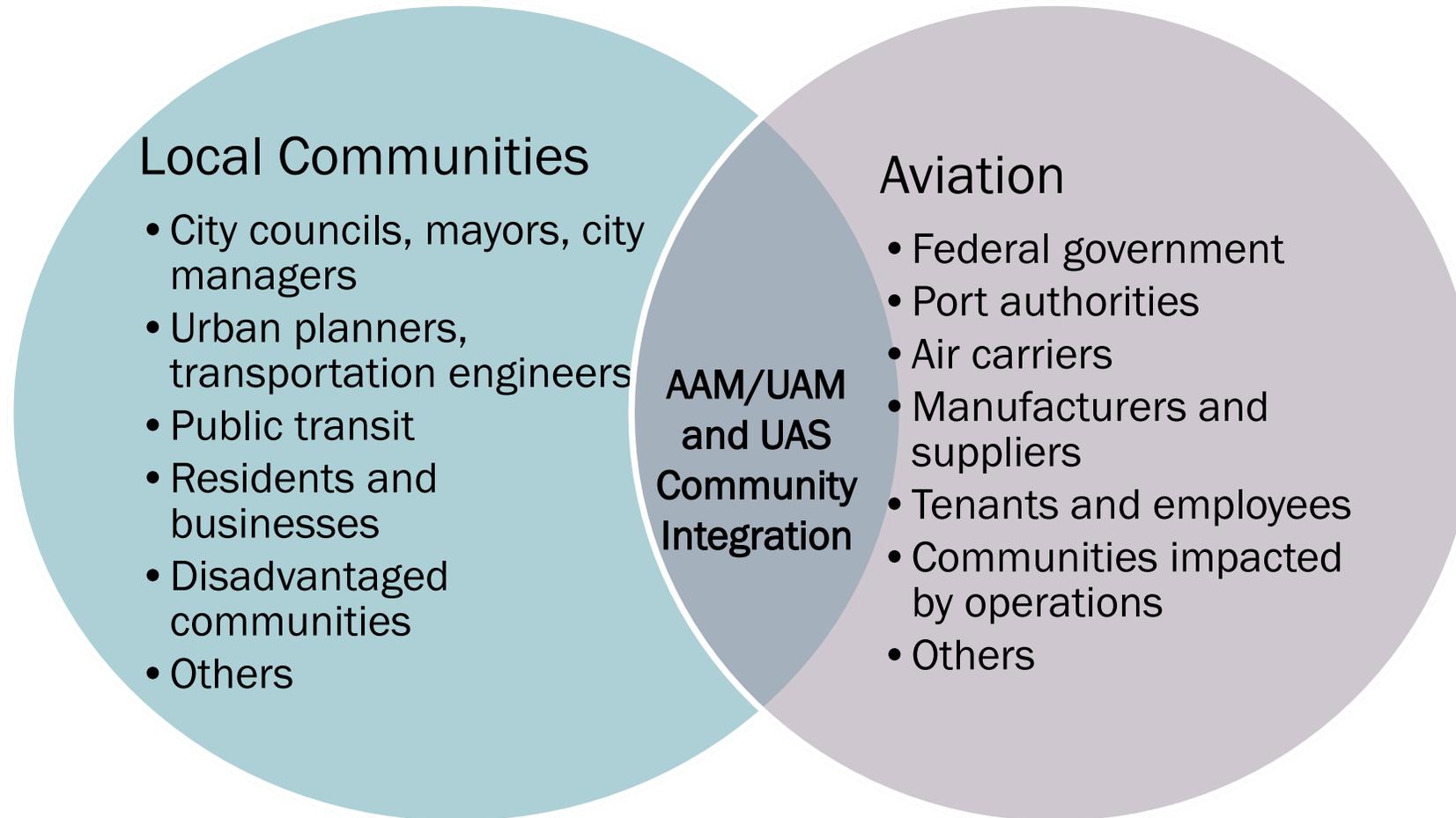
Microhaul Airline Operations

- Scheduled air carrier flights with set routes and times
- Potential to serve regional air mobility, and for hub airport access.
- Potential to increase utility of smaller nearby airports and distribute passengers

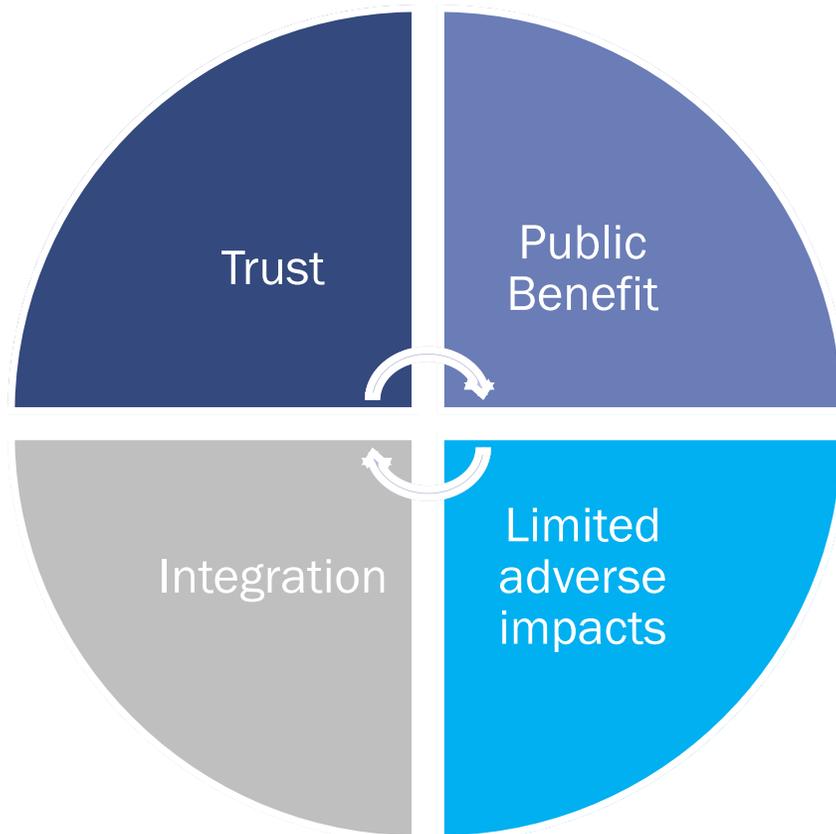


Image: Cape Air New England Route Map

Understanding Community Integration: The Convergence of Two Historically Distinct Disciplines



Public Acceptance is Multifaceted



Trust



Safe Vehicles



Safe Infrastructure



Secure Operations

Public Benefit



Emergency Services



Increased travel options



Economic opportunities

Limited Adverse Impacts



Noise and visual impact



Emissions and environment



Privacy

Integration



Existing transit & roads



Grid capacity



Social Equity

Potential Impacts of AAM



Connect affordable housing with jobs and services



Reduced emergency response times



Stronger connection of rural areas to urban opportunities



Workforce development and economic opportunities



Increased utility of GA airport infrastructure



Noise and visual pollution



Increased demands on local grid capacity



Negative impacts on existing public transit



Sprawl and gentrification



Competition for funding for other critical infrastructure

Multimodal Integration

Physical integration provides places where people can make seamless connections between travel modes (e.g., AAM, on-demand mobility, shared AVs, public transportation)

Co-locating multiple modes could support development of mobility areas and create a network effect that can multiply effectiveness of AAM, on-demand mobility, and shared AVs

Integration with mobility on demand (MOD), mobility as a service (MaaS), and public transportation is key

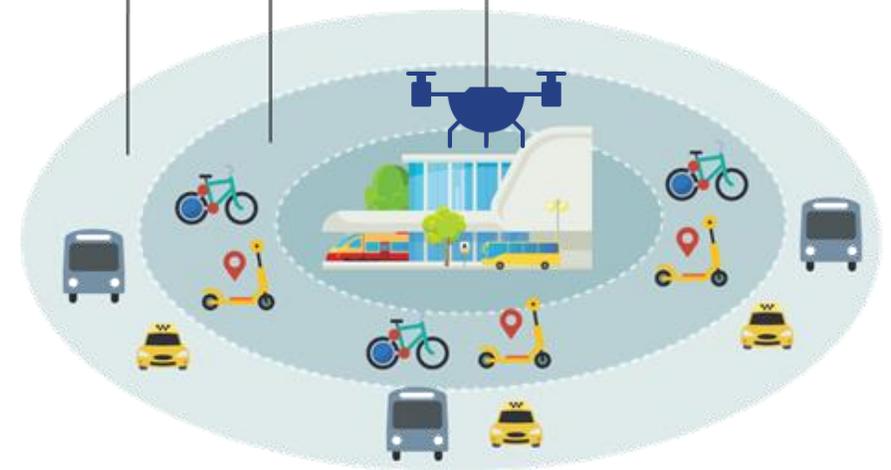
Airports have the opportunity to become unique and valuable community assets as mobility hubs and microgrids.

MOBILITY AREAS

CATCHMENT AREA

ZONE

CORE



Systems Master Planning for Advanced Air Mobility

A comprehensive process which includes internal assessment, community engagement, resources and data collection, and development of an implementation plan. Considerations include:

- Integration into multi-modal transportation systems
- Incorporating local priorities and policies
- Addressing sustainability – environment, economy, equity
- Business models and forecasting
- Infrastructure mapping
- Airspace management and route design
- Grid capacity and power strategies
- Funding and timelines

Concluding Thoughts

- Airports provide a key piece to the advanced air mobility puzzle, and there is an opportunity to revitalize underused or disused GA airports
- Planning and policy are needed mitigate adverse impacts and maximize potential benefits
- Key focus areas:
 - Multimodal integration
 - Land use
 - Environmental impacts
 - Social equity
- Research, demonstrations, and evaluations can:
 - Assist local and regional governments develop the ability to integrate AAM with existing transportation services
 - Understand the impacts, equity, and community concerns with AAM
 - Validate the technical and institutional feasibility of AAM deployments



CAMI's Online Resources

CAMI Notes:

- What is Urban Air Mobility?
- Community Benefits of Urban Air Mobility
- eVTOL Aircraft: What they are & why they matter
- Urban Air Mobility Operations Overview
- Legal Considerations for Urban Air Mobility
Part 1: Aviation Law
- Components of Public Acceptance for AAM & UAM

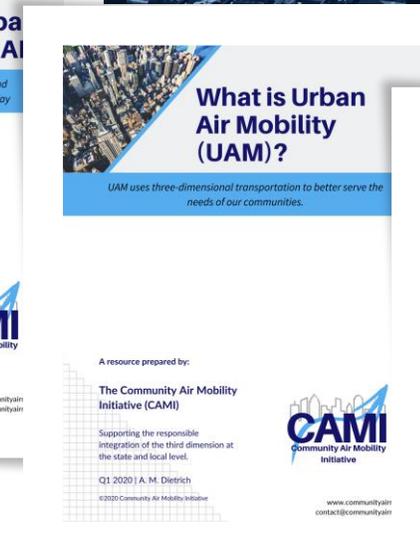
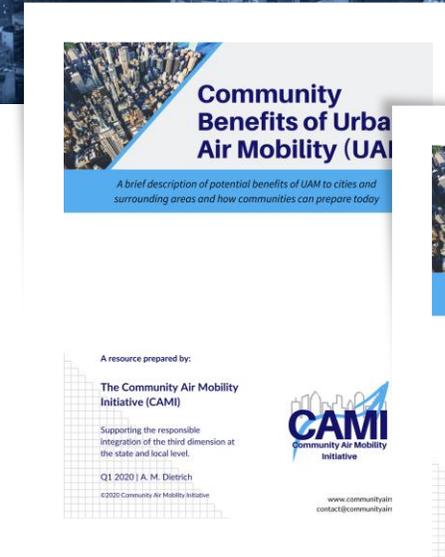
Videos

- UAM 101
- American Planning Association: Advanced Air Mobility
- AAM 101

Guidebooks (coming soon)

- Why We Need Advanced Air Mobility for our Cities: A Planner's Guide to Advanced Air Mobility
- Incorporating Advanced Air Mobility into Regional and GA Airports
- Foundational Information for Advanced Air Mobility

<https://www.communityairmobility.org/resources>



The mission of the Urban Air Policy Collaborative is to develop a policy framework for the local implementation of advanced air mobility through the sharing of knowledge, discussion of issues, development of recommendations, and collaboration with peers through an ongoing program of workshops, presentations and conversations.

The UAPC has two programs – the Cohort and the Forum



Kickoff Meeting

Module 1: AAM Fundamentals Part 1: Aircraft, Air Traffic Management, and the Existing Regulatory Environment

Module 2: AAM Fundamentals Part 2: AAM Operations - Use Cases, Operational Zones, Safety, and Security

Module 3: Social Equity and Integrating AAM into the Transportation Ecosystem: Multimodal Integration, Equity, Community Engagement

Module 4: AAM Modeling and Forecasting: Regional and Local Modeling and Simulation, Market and Economic Forecasting

Module 5: Community and Environmental Impacts Part: Noise, Visual Pollution, Routes

Module 6: Planning for AAM Part 1: Developing an AAM Plan and Policy Framework, Vertiport Locations, Vertiport Ownership Considerations

Module 7: Planning for AAM Part 2: AAM at Existing Airports, Digital Policy, Utilities and Energy

Module 8: Roles and Responsibilities, Next Steps, and Wrap Up



Supporting the responsible integration of the third dimension into our daily transportation needs through education and advocacy.

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