Advanced Air Mobility: Community Integration and Public Acceptance

NASA Community Integration Working Group
March 4, 2021
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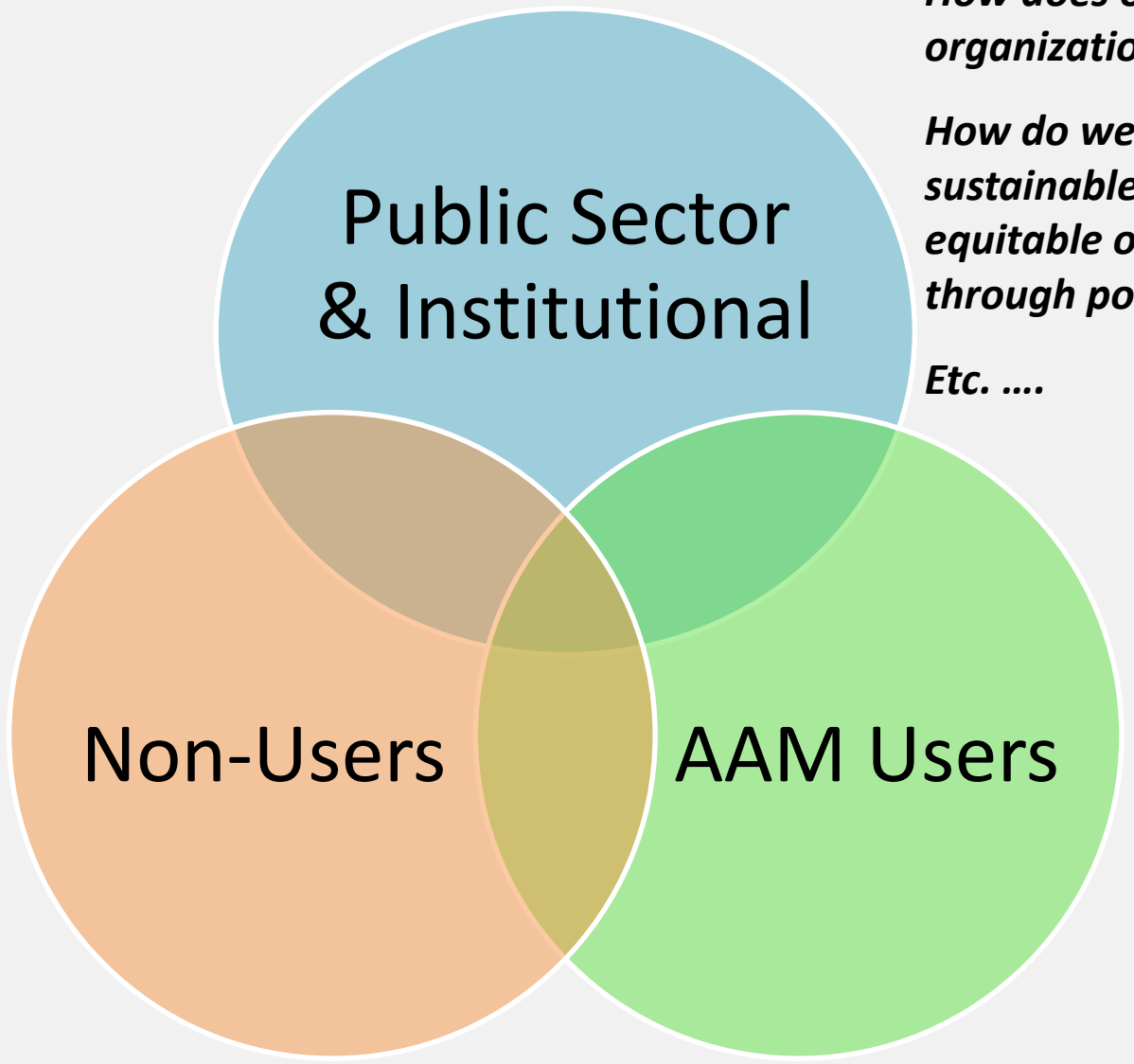
Presentation Overview

- Community Integration Basics
- The Transportation Planning Process
- Multimodal Integration
- Potential Concerns with AAM
  - Equity
  - Visual and Noise Pollution
  - Privacy
  - Safety and Security
- Early Understanding of Potential Societal Barriers
- Next Steps

“All politics is local”

Tip O'Neill , Former Speaker of the House

Public Acceptance



What are the community impacts?

How does our organization prepare?

How do we guide sustainable and equitable outcomes through policy?

Etc. ….

Is it safe?

What are the impacts on my neighborhood?

Etc. ….

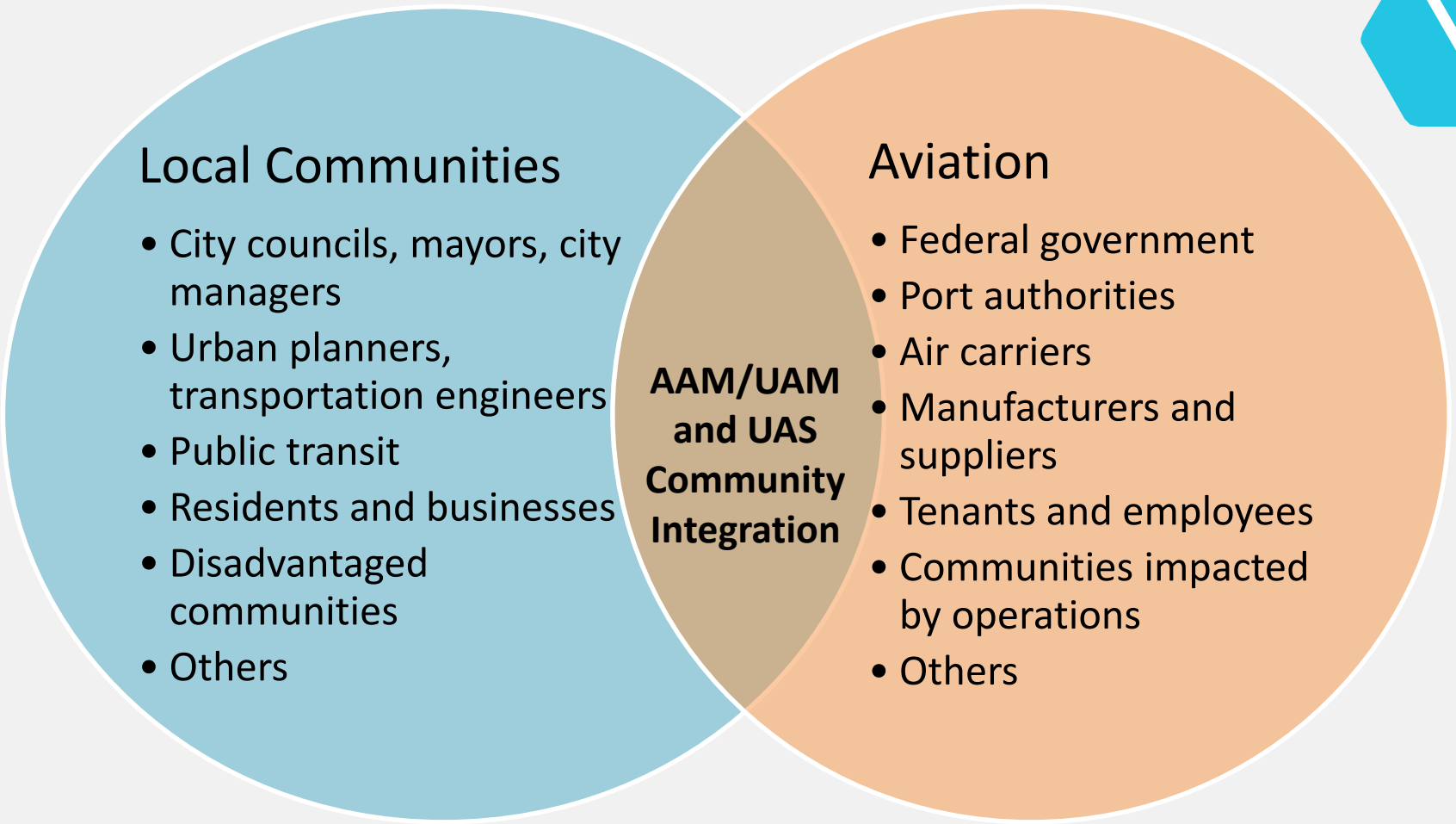
Is it safe , convenient, affordable, and comfortable to fly?

How does AAM compare to other alternatives?

Etc. ….

Cohen 2020

Understanding Community Integration: The Convergence of Two Historically Distinct Disciplines

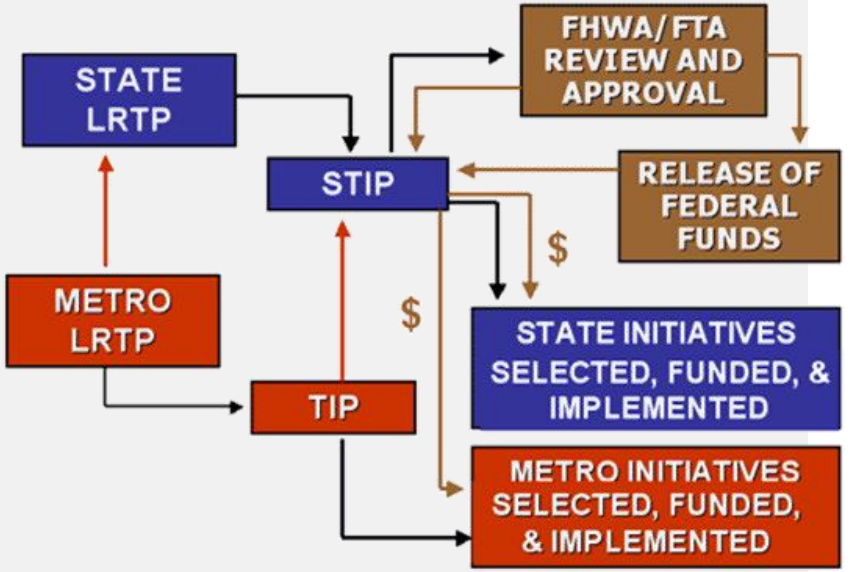


Cohen 2020

Local and Metropolitan Transportation Planning

Metropolitan Planning Organizations (MPOs)

- Federally mandated and funded transportation policy-making organization for regions with more than 50,000 people
- Conducts regional planning (e.g., Regional Transportation Planning/RTP)
- Evaluates transportation alternatives
- Allocates transportation funding (e.g., Transportation Improvement Program/TIP)
- Facilitates collaboration among public agencies
- Engages residents and other stakeholders in the planning process



Some may have additional roles in growth, housing, public transit, air quality, and climate action policies

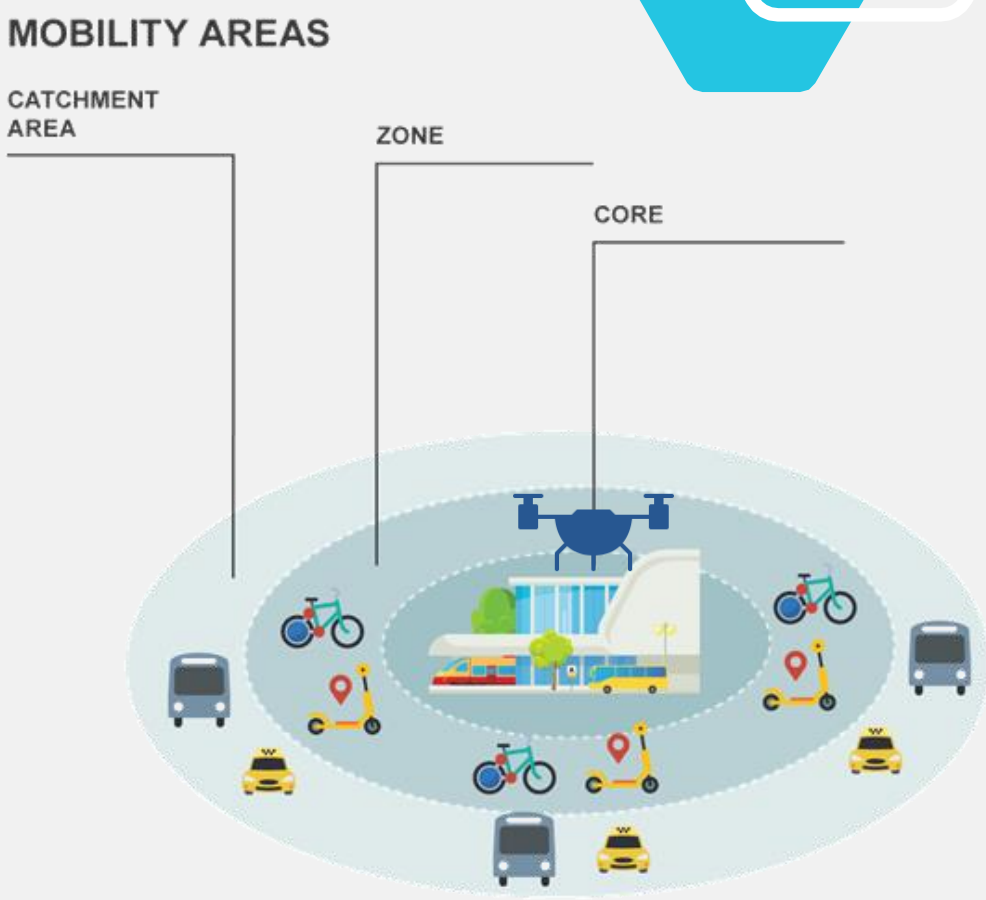
Cohen 2021; Image Source: USDOT

Multimodal Integration

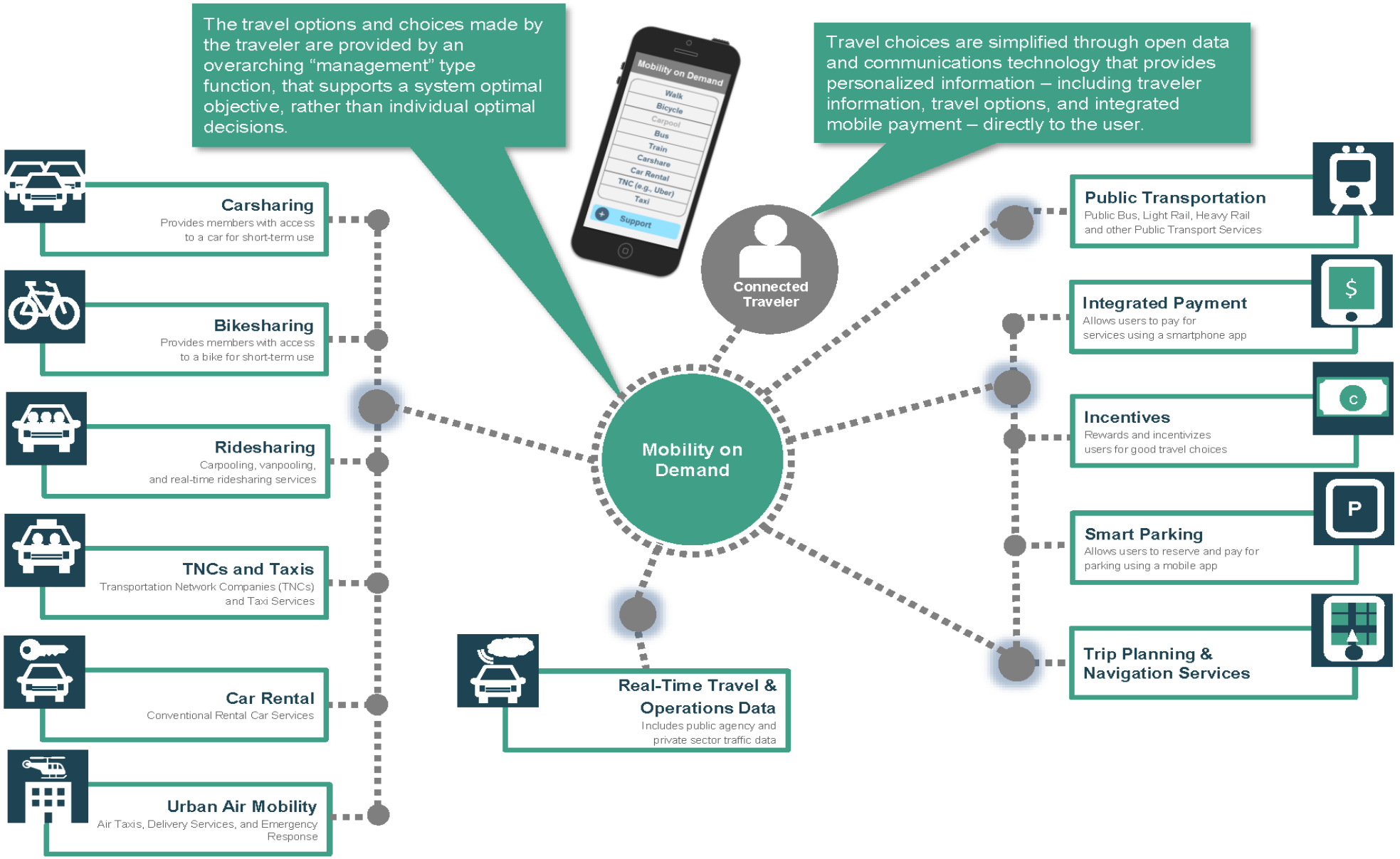
Physical integration provides places where people can make seamless connections between travel modes (e.g., AAM, on-demand mobility, shared AVs, public transportation)

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



Shaheen and Cohen (2020)


The travel options and choices made by the traveler are provided by an overarching "management" type function, that supports a system optimal objective, rather than individual optimal decisions.
Travel choices are simplified through open data and communications technology that provides personalized information – including traveler information, travel options, and integrated mobile payment – directly to the user.
Mobility on Demand
Walk
Bicycle
Carpool
Bus
Train
Carshare
Car Rental
TNC (e.g., Uber)
Taxi
Support
Connected Traveler
Mobility on Demand
Carsharing
Provides members with access to a car for short-term use
Bikesharing
Provides members with access to a bike for short-term use
Ridesharing
Carpooling, vanpooling, and real-time ridesharing services
TNCs and Taxis
Transportation Network Companies (TNCs) and Taxi Services
Car Rental
Conventional Rental Car Services
Urban Air Mobility
Air Taxis, Delivery Services, and Emergency Response
Real-Time Travel & Operations Data
Includes public agency and private sector traffic data
Public Transportation
Public Bus, Light Rail, Heavy Rail and other Public Transport Services
Integrated Payment
Allows users to pay for services using a smartphone app
Incentives
Rewards and incentivizes users for good travel choices
Smart Parking
Allows users to reserve and pay for parking using a mobile app
Trip Planning & Navigation Services

Potential Concerns with AAM

Flight Paths and En-Route Operations

- Multimodal Integration
- Equity (i.e., what neighborhoods flights are be flown over)
- Air Congestion / Ops Tempo
- Noise and Visual Pollution
- Privacy and Increased Air Traffic Over Sensitive Land Uses

Vertiports

- Multimodal Integration and Ground Congestion
- Equity (e.g., gentrification, displacement, etc.)
- Approach Congestion/Ops Tempo
- Noise and Visual Pollution

Cross-Cutting Issues

- Equity and Affordability
- Safety
- Privacy

Cohen and Shaheen 2020

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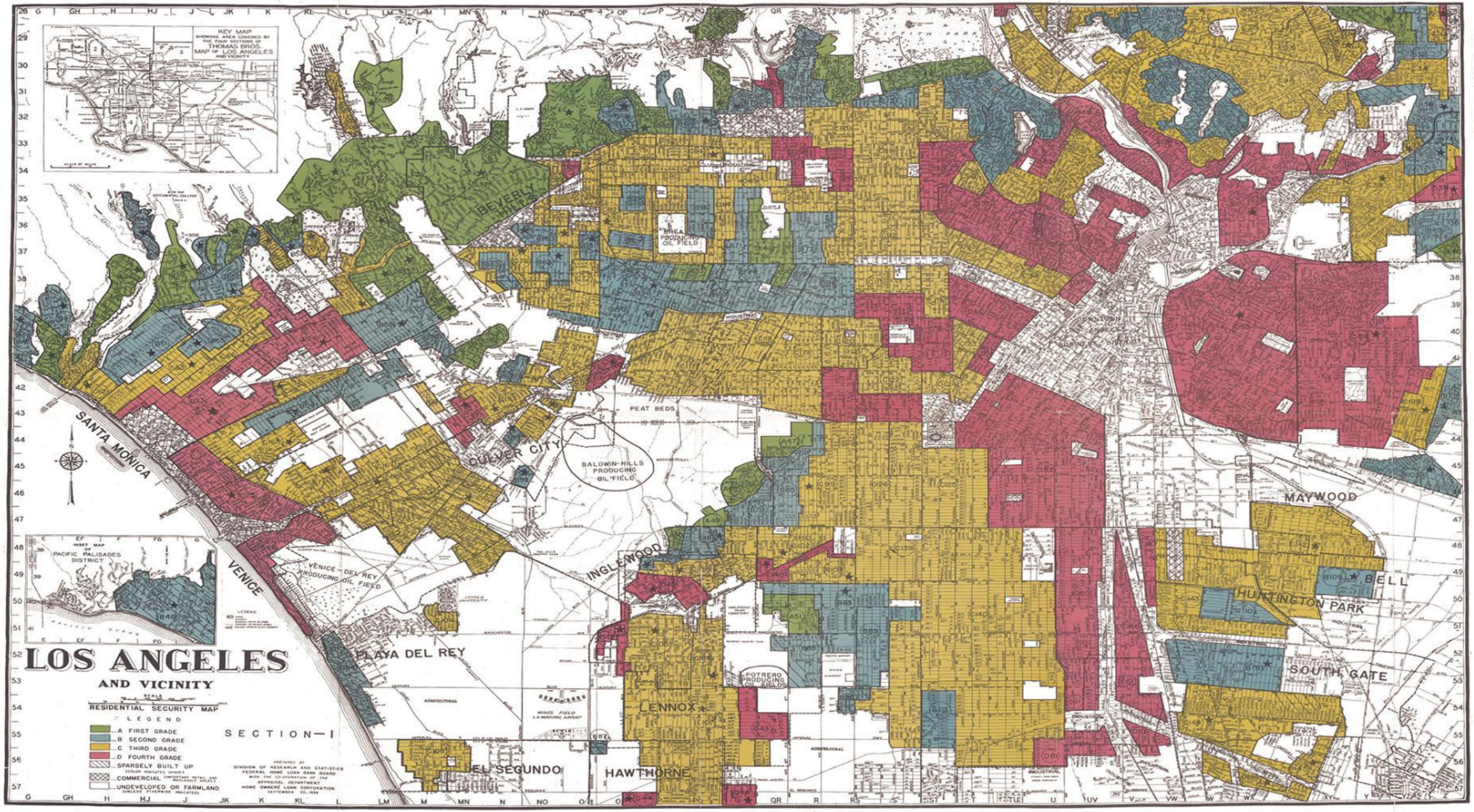

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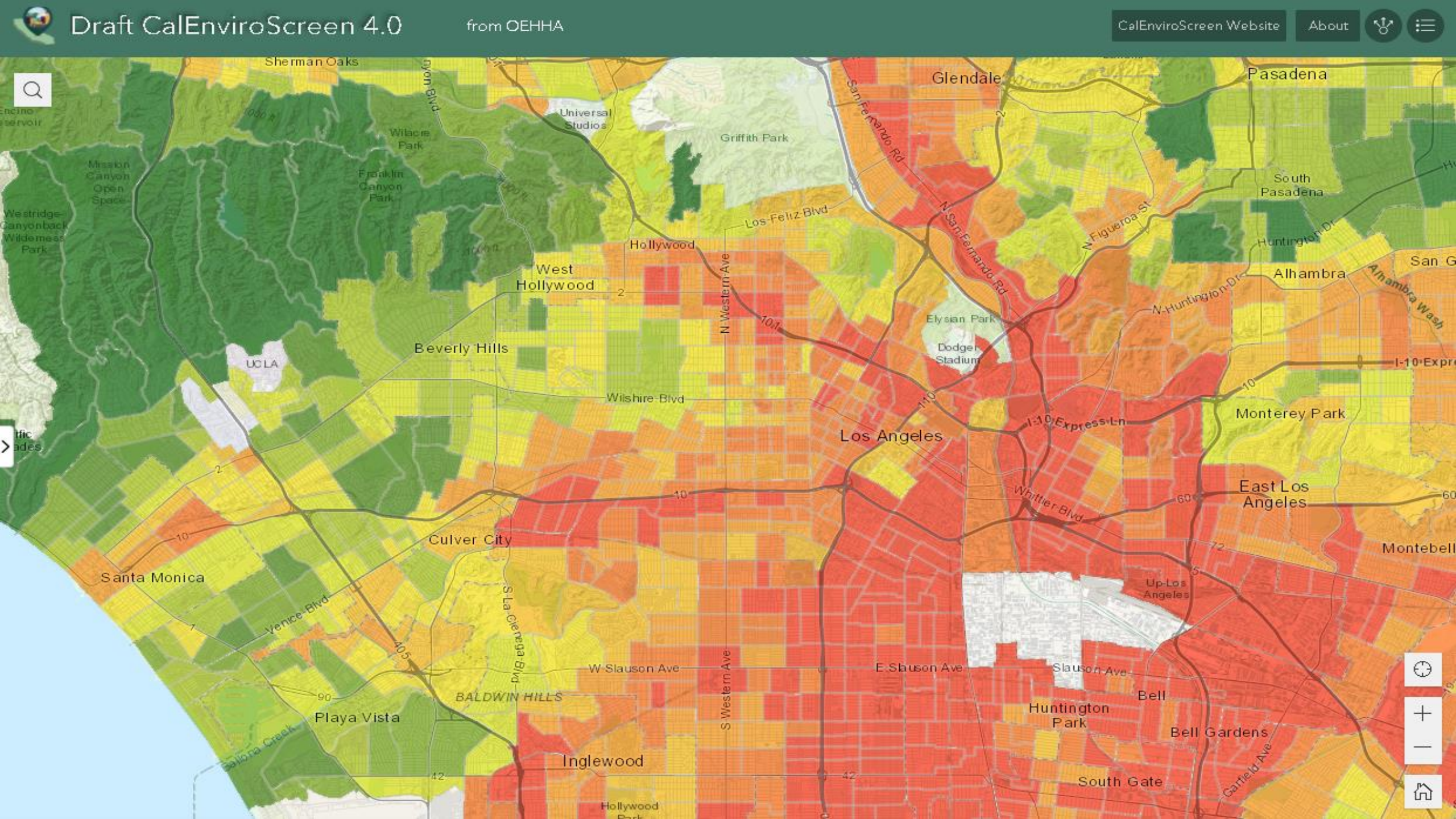
Draft CalEnviroScreen 4.0
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About
Sherman Oaks
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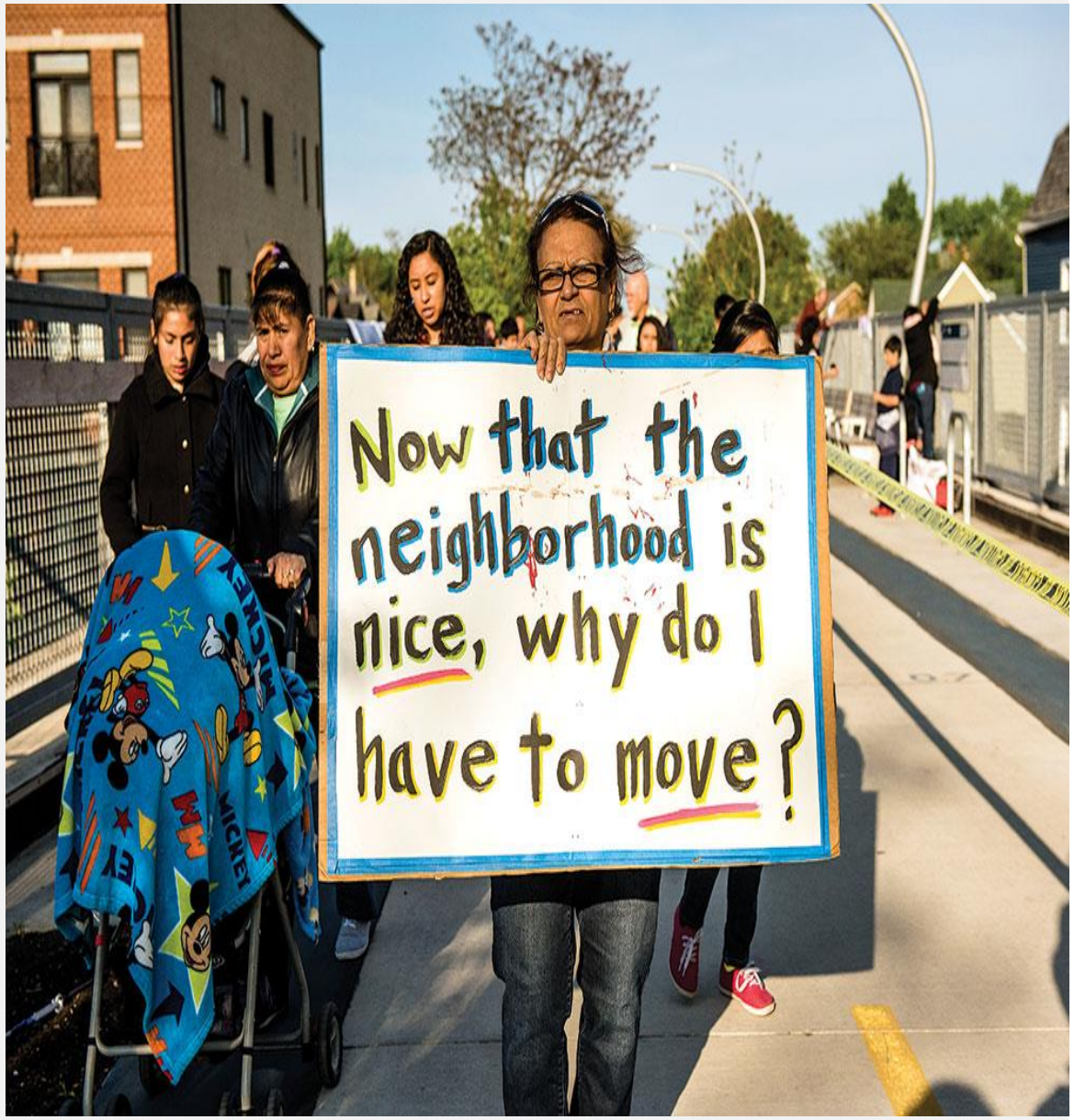
Mission Canyon Open Space
Franklin Canyon Park
Westridge-Canyonback Wilderness Park
South Pasadena
Los Feliz Blvd
Hollywood
West Hollywood
N Western Ave
N San Fernando Rd
N Figueroa St
Huntington Dr
Alhambra
Alhambra Wash
Elysian Park
Dodger Stadium
N Huntington Dr
Beverly Hills
UCLA
Wilshire Blvd
I-10 Express Ln
Monterey Park
Los Angeles
East Los Angeles
Whittier Blvd
Culver City
Santa Monica
Venice Blvd
S La Cienega Blvd
S Western Ave
W Slauson Ave
E Slauson Ave
Slauson Ave
Up-Los Angeles
Montebell
BALDWIN HILLS
Playa Vista
Ballona Creek
Huntington Park
Bell
Bell Gardens
Inglewood
South Gate
Garfield Ave
Hollywood Park

Equity

Where a vertiport gets placed could have huge implications on …

- Environmental impacts
  - Fight paths to/from a vertiport
  - Vertiport vicinity
- Affordability of Services
- Access for People with Disabilities
- Gentrification and displacement
- Allocation of limited public resources
  - Does a public agency invest in AAM at the expense of another investment (e.g., transit, active transportation, roadways, etc.)?



Cohen, Shaheen, & Farrar, forthcoming


¿Vas solo?
Por eso ya nunca
se ven los volcanes.
CDMX
TAXI
LPT-14-19

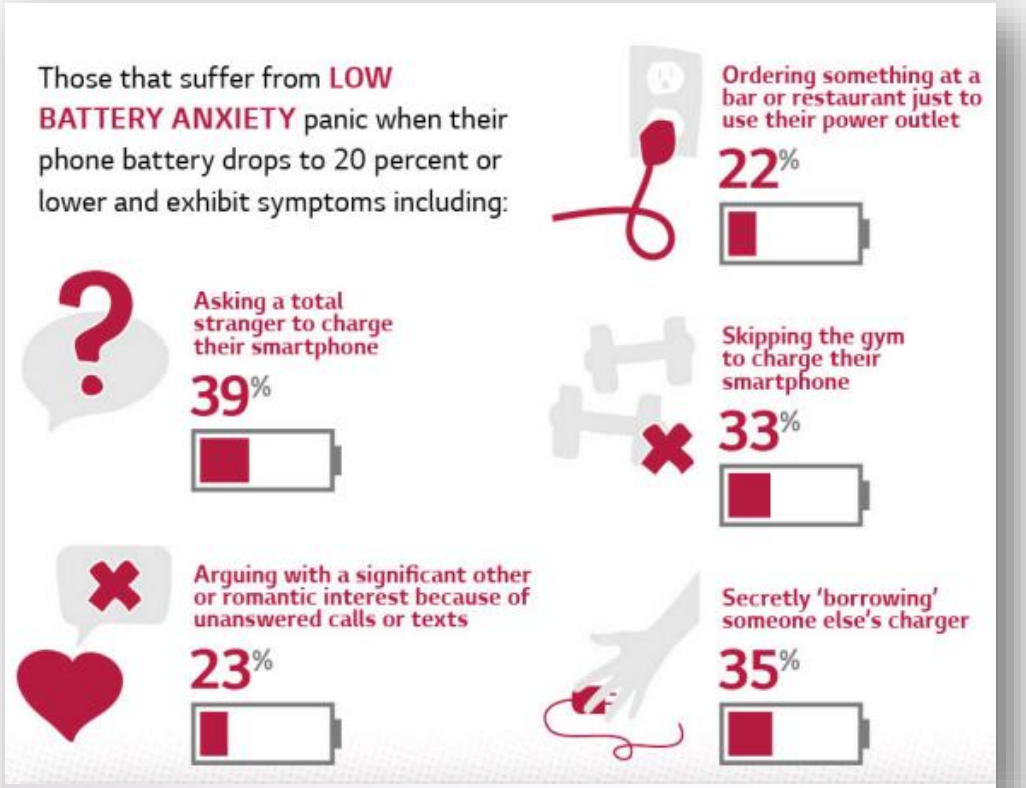
Noise, Visual Pollution, and Privacy

- Individual aircraft and scaled operational noise
- Aesthetic impacts of low-level aircraft on views and/or the natural environment
- The use of cameras or sensors to take to take photos, videos, or other surveillance without someone's knowledge or consent
- Data privacy including the collection, storage, management, and sharing of user, financial, location, and trip data

Cohen, Shaheen, & Farrar, forthcoming

Safety and Security

- Personal safety from other passengers
- Public concerns about operational safety (new propulsion types, range anxiety, autonomy)
- Cyber and physical security threats, such as sabotage and terrorism



Cohen, Shaheen, & Farrar, forthcoming

Early Understanding of Potential Societal Barriers

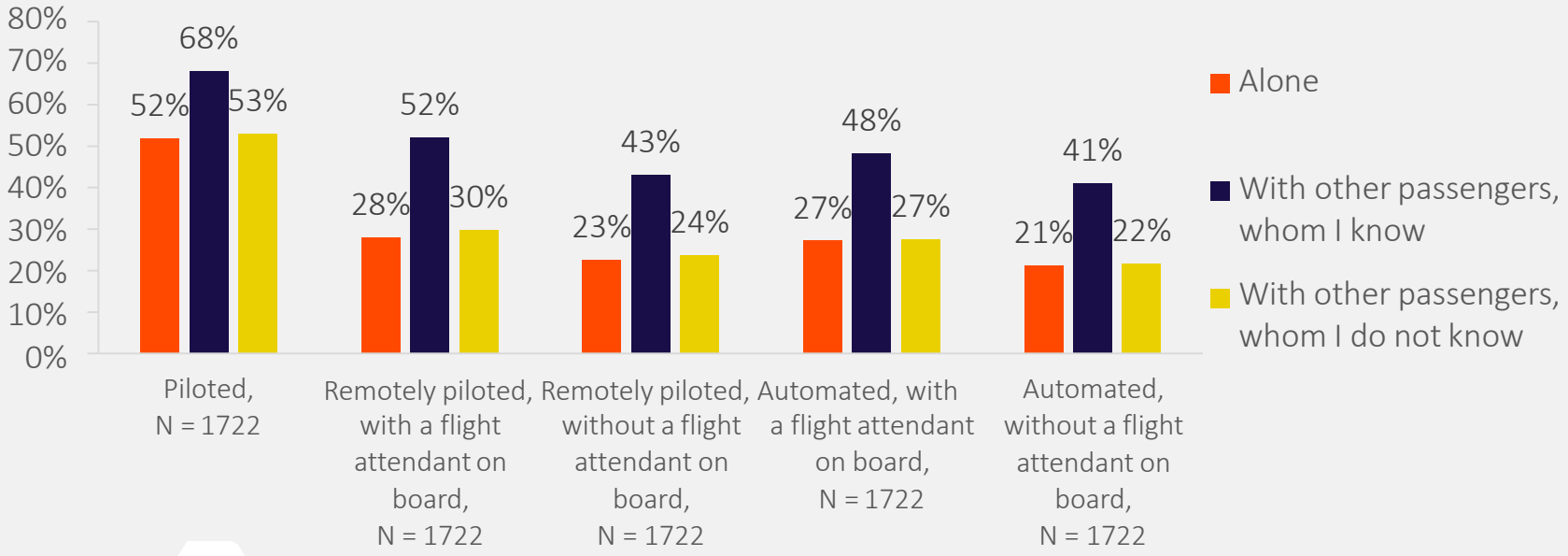
- Generally, neutral to positive reactions to the UAM concept, with some skepticism
- Cost is a primary consideration
- Personal security was an important factor (e.g., confidence in the aircraft, security/safety from flying with potentially dangerous or unruly passengers)
- Some respondents expressed privacy concerns (e.g., people flying overhead, sight lines into homes/yards) and increased noise levels)
- Public perception of fully autonomous aircraft is one of the largest barriers

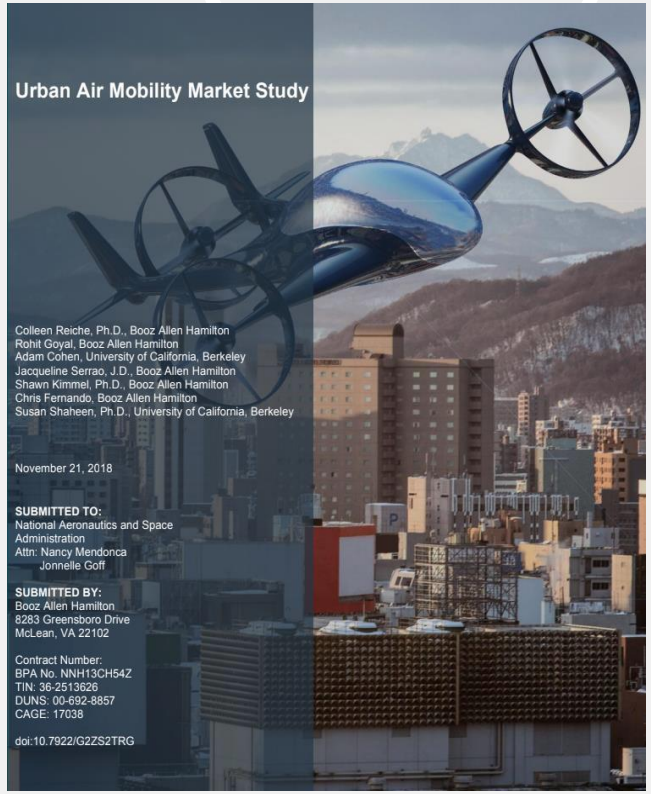
	Excited	Happy	Neutral	Confused	Concerned	Surprised	Skeptical	Amused
GEOGRAPHIC LOCATION				**Survey Results**				
Houston, N = 344	32%	24%	27%	8%	9%	11%	19%	3%
San Francisco Bay Area, N = 337	33%	25%	27%	8%	9%	11%	20%	3%
Los Angeles, N = 345	32%	24%	27%	8%	9%	11%	19%	3%
Washington, D.C., N = 341	32%	24%	27%	8%	9%	11%	20%	3%
New York City, N = 344	32%	24%	27%	8%	9%	11%	19%	3%
GENDER				**Survey Results**				
Female, N = 976	26%	22%	26%	10%	11%	11%	20%	4%
Male, N = 734	37%	23%	23%	6%	10%	8%	18%	4%
INCOME				**Survey Results**				
Less than $10,000, N = 78	14%	17%	40%	8%	3%	4%	10%	3%
$10,000 - $14,999, N = 53	19%	23%	30%	6%	6%	6%	6%	6%
$15,000 - $24,999, N = 101	25%	12%	36%	7%	3%	6%	7%	3%
$25,000 - $49,999, N = 212	28%	15%	27%	8%	5%	3%	11%	2%
$50,000 - $74,999, N = 210	28%	22%	25%	7%	4%	5%	8%	0%
$75,000 - $99,999, N = 192	30%	30%	14%	7%	5%	2%	9%	1%
$100,000 - $149,999, N = 182	36%	14%	25%	4%	6%	1%	12%	2%
$150,000 - $199,999, N = 101	27%	21%	20%	8%	6%	6%	9%	2%
$200,000 or more, N = 112	35%	12%	21%	7%	11%	4%	11%	0%
AGE				**Survey Results**				
18 - 24 years, N = 110	22%	25%	34%	5%	2%	4%	5%	2%
25 - 34 years, N = 271	32%	28%	19%	4%	4%	3%	8%	1%
35 - 44 years, N = 191	43%	16%	17%	6%	5%	2%	8%	3%
45 - 54 years, N = 132	30%	16%	21%	8%	9%	3%	9%	2%
55 - 64 years, N = 178	26%	15%	29%	9%	7%	4%	8%	1%
65 - 74 years, N = 169	14%	12%	33%	9%	6%	4%	18%	1%
75+ years, N = 42	10%	14%	31%	10%	7%	2%	24%	0%

Reiche, Goyal, Cohen et al. (2018); Shaheen, Cohen and Farrar (2018)

Early Understanding of Potential Societal Barriers

Please select whether you would be willing to travel in an Urban Air Mobility aircraft in the following situations (i.e., piloted, remotely piloted, or automated) by yourself, and/or with other people on board.





Study available at:
https://escholarship.org/uc/item/0fz0x1s2

Reiche, Goyal, Cohen et al. (2018); Shaheen, Cohen and Farrar (2018)

Next Steps

- More work is needed to integrate AAM with transportation plans and programs
- More research is needed to understand potential barriers to community acceptance
- Demonstrations and evaluations are needed to:
  - Enhance institutional and public readiness for AAM
  - Assist local and regional governments develop the ability to integrate AAM with existing transportation services
  - Understand community concerns associated with AAM
  - Validate the technical and institutional feasibility of AAM deployments
  - Measure the impacts of AAM on users, non-users, and transportation systems
  - Examine public sector requirements, regulations, and policies that may support or impede institutional readiness and community acceptance of AAM

Cohen and Shaheen (2021)

Thank You

Special thanks to NASA for organizing this session.

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