



CORGAN ■ HUGO

April 2023

Aviation Master Planning

A Leading Architecture and Design Firm



Experience — Signature Projects

#3

**US Aviation
Architect**

BD+C 2022 Giants



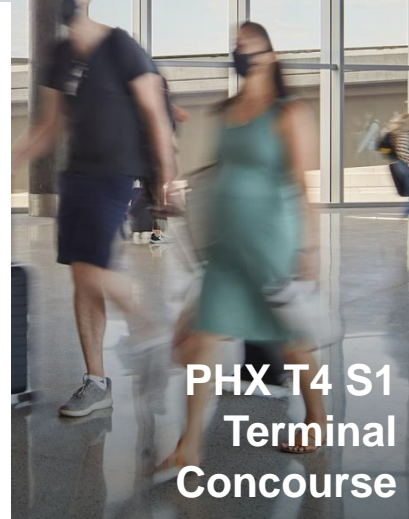
LGA Delta Airlines New Terminal C



#8

**Architecture
Firm**

BD+C 2022 Giants



PHX T4 S1
Terminal
Concourse

#2

**Transportation
Interior Design
Firm**

Interior Design Magazine
Top 100 Giants



CLT Airport Dimensions Lounge

#1

**US Data Centers
Architect**

BD+C 2021 Giants



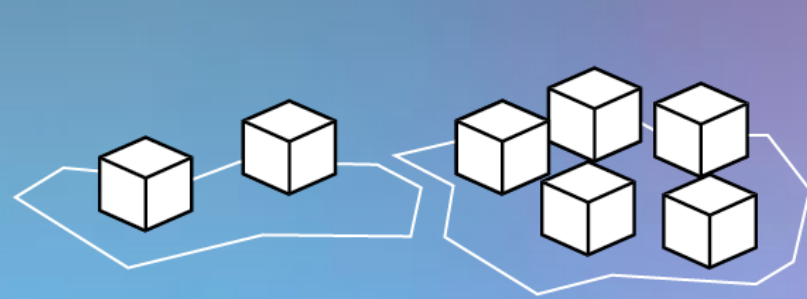
ORD Global Terminal



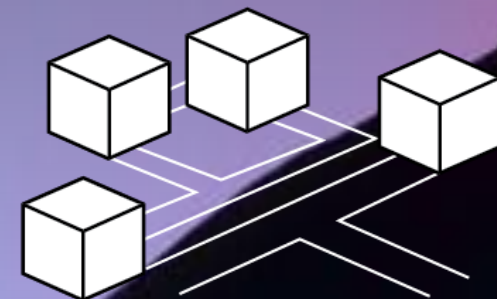
elevating **data-driven** design research
around the **human experience**

How do we design
for the future?

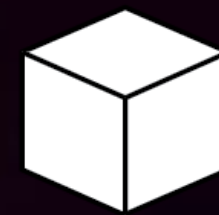
...and what drives our
behaviors and decision making?



ECOSYSTEM



NEIGHBORHOOD



BUILDING



SPACE



PRODUCTS



USER



FOOD INNOVATIONS

**CONVENIENCE & ON-
DEMAND IN THE
GATE LOUNGE**

**AIRLINE VALET
SERVICES**

WELLNESS

**AIRPORT OPERATED
AUTONOMOUS FLEETS**

AERIAL RIDESHARE

**CHARGING
INFRASTRUCTURE**

**SELF-SERVICE
TICKETING HALL**

**BIOMETRICS AND
ENHANCED SECURITY
SCREENING**

**IDENTITY
MANAGEMENT**

**EFFICIENT QUEUE
MANAGEMENT**

**AUTONOMOUS
ASSISTANTS IN THE
TERMINAL**

DATA MANAGEMENT

**USER ENGAGEMENT
SERVICES**

**SELF-SERVICE IN
CONCESSIONS**

**INFORMATION
TRANSPARENCY**

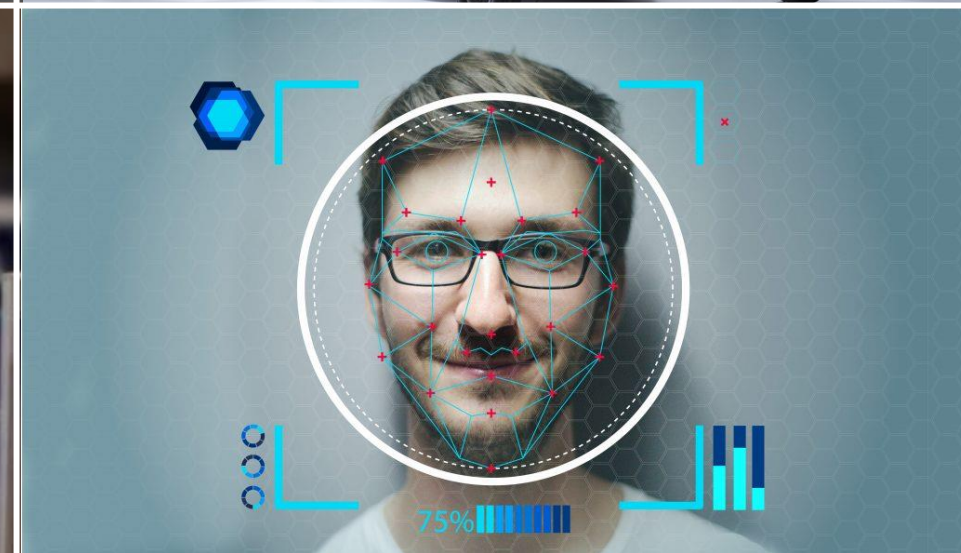
FOOD INNOVATIONS



I'VE GONE
HANDS FREE



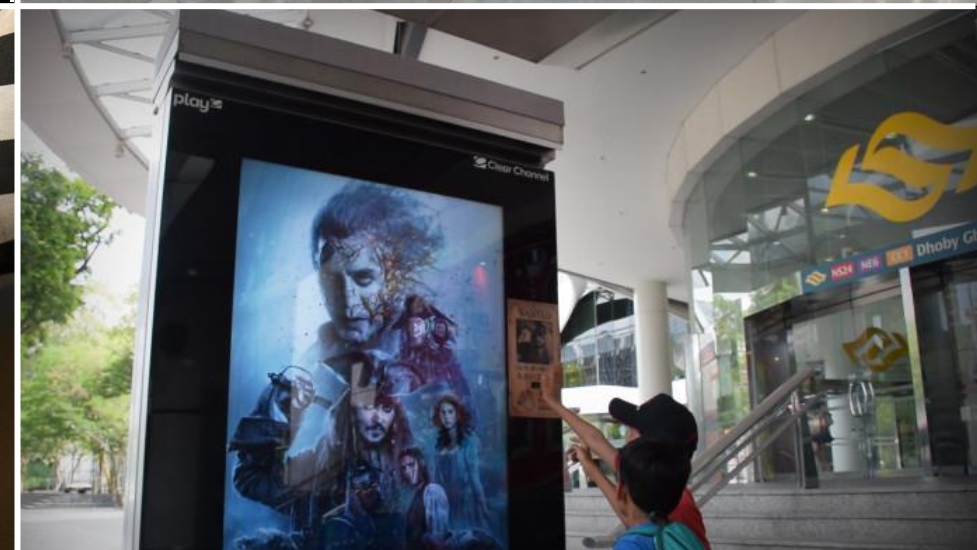
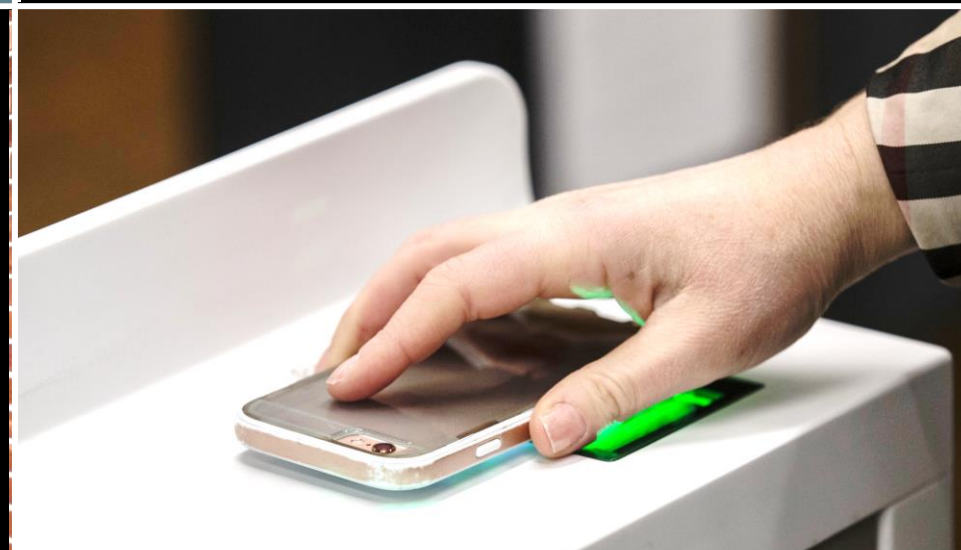
SELF-SERVICE TICKETING HALL



EFFICIENT QUEUE MANAGEMENT



USER ENGAGEMENT SERVICES



An airport masterplan provides a road map for efficiently **meeting aviation demand** through the foreseeable future while **preserving the flexibility** necessary to respond to changing **industry conditions and user needs**

1

INFRASTRUCTURE

2

TRANSPORTATION

3

SAFETY + SECURITY

4

ENVIRONMENTAL PLANNING

5

TECHNOLOGY

6

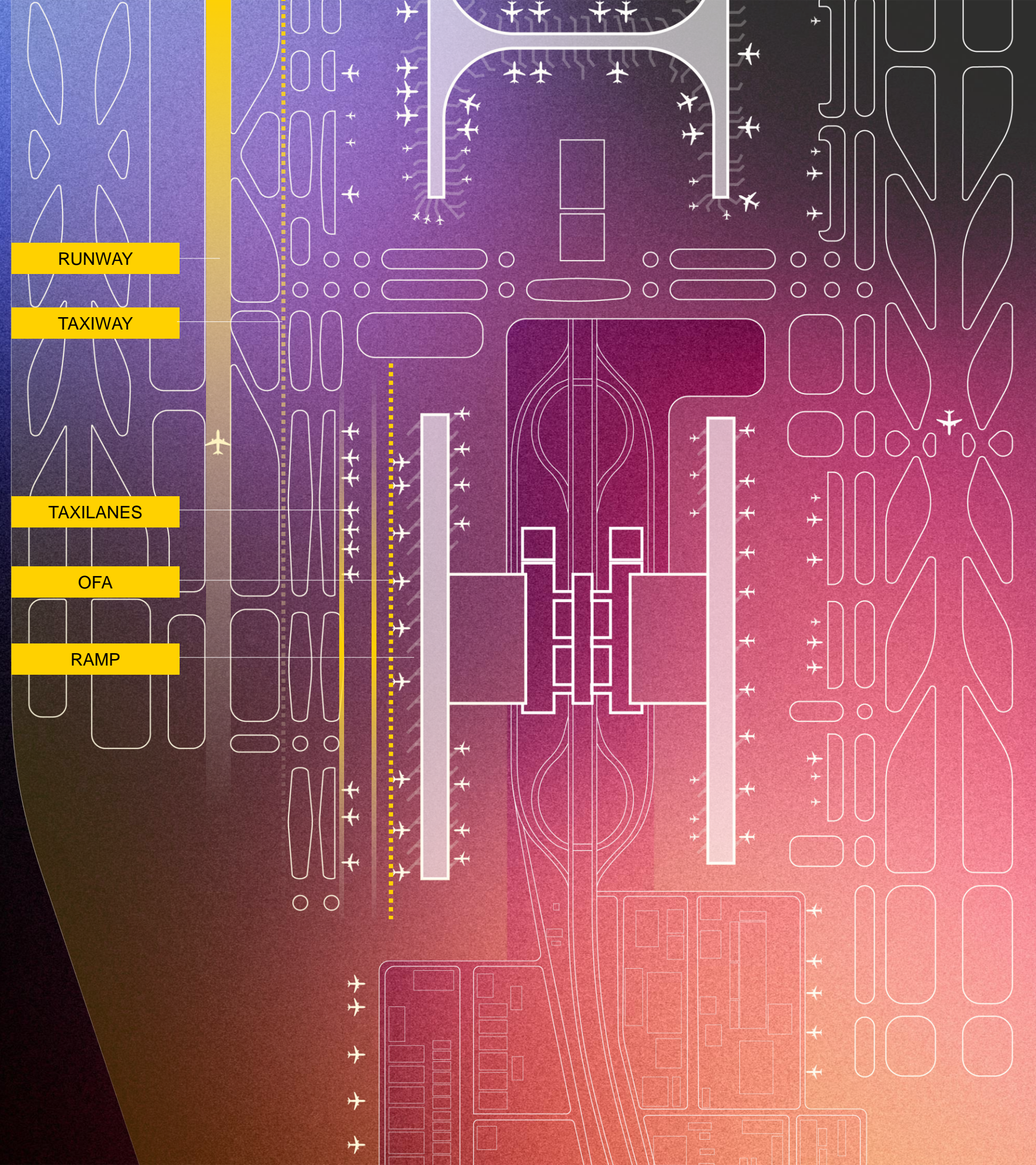
PASSENGER EXPERIENCE



INFRASTRUCTURE

Airports require the design and operation of runways, taxiways, aprons, and terminals.

Similar infrastructure will be required on the moon for landing and launching spacecraft, storing and handling equipment and supplies, and accommodating crew members.



Pre-Planning // Determining Capacity

VISIONING

Aligning stakeholders helps to:

- Identify objectives
- Determine scope and scale
- Establish financial thresholds

INVENTORY OF EXISTING CONDITIONS

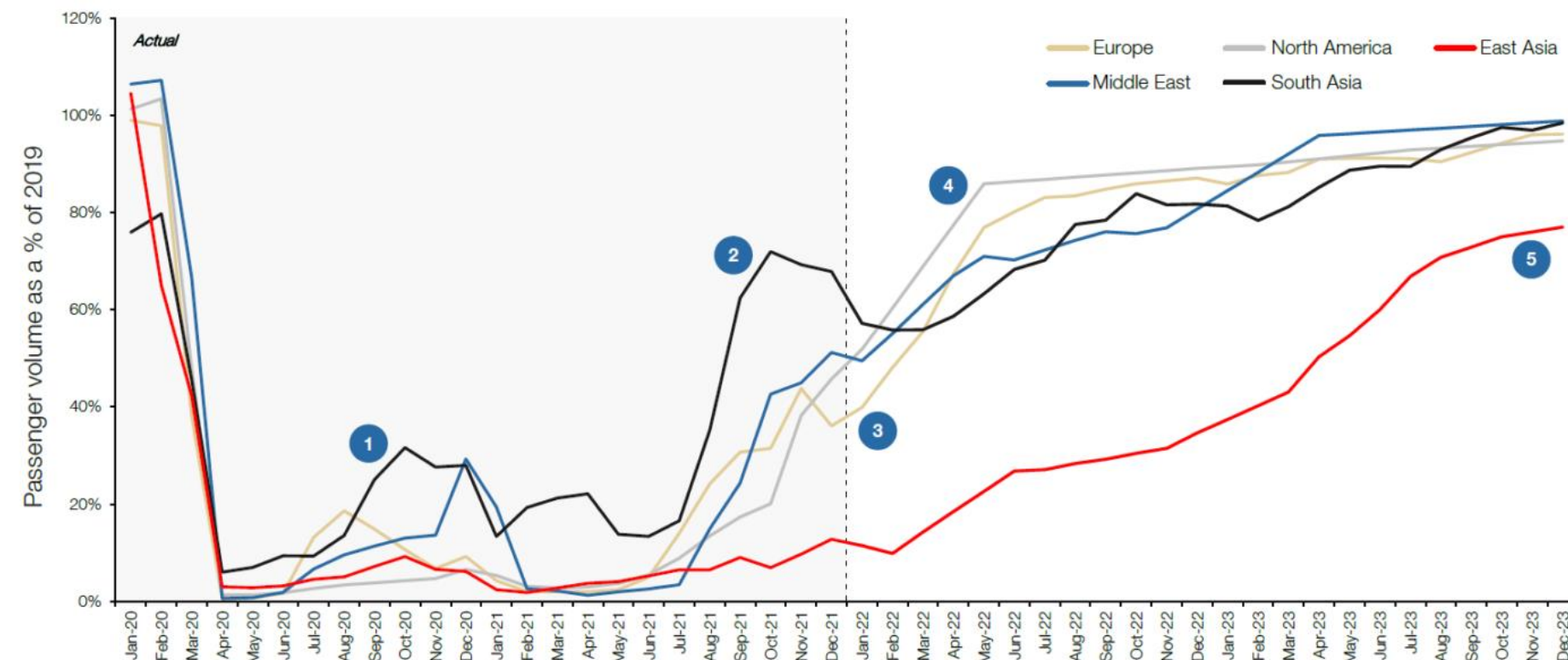
Examining the proposed site helps to:

- Identify existing operations (if any)
- Determine site constraints and local construction techniques
- Define terrain, topography, altitude, elevation, climate and seasonal patterns, wind flow, and glare – all of which can determine the shape, direction, and design of the development

FORCAST OF AVIATION DEMAND

Reviewing daily flight schedules, type of aircraft, and number of passengers helps to determine:

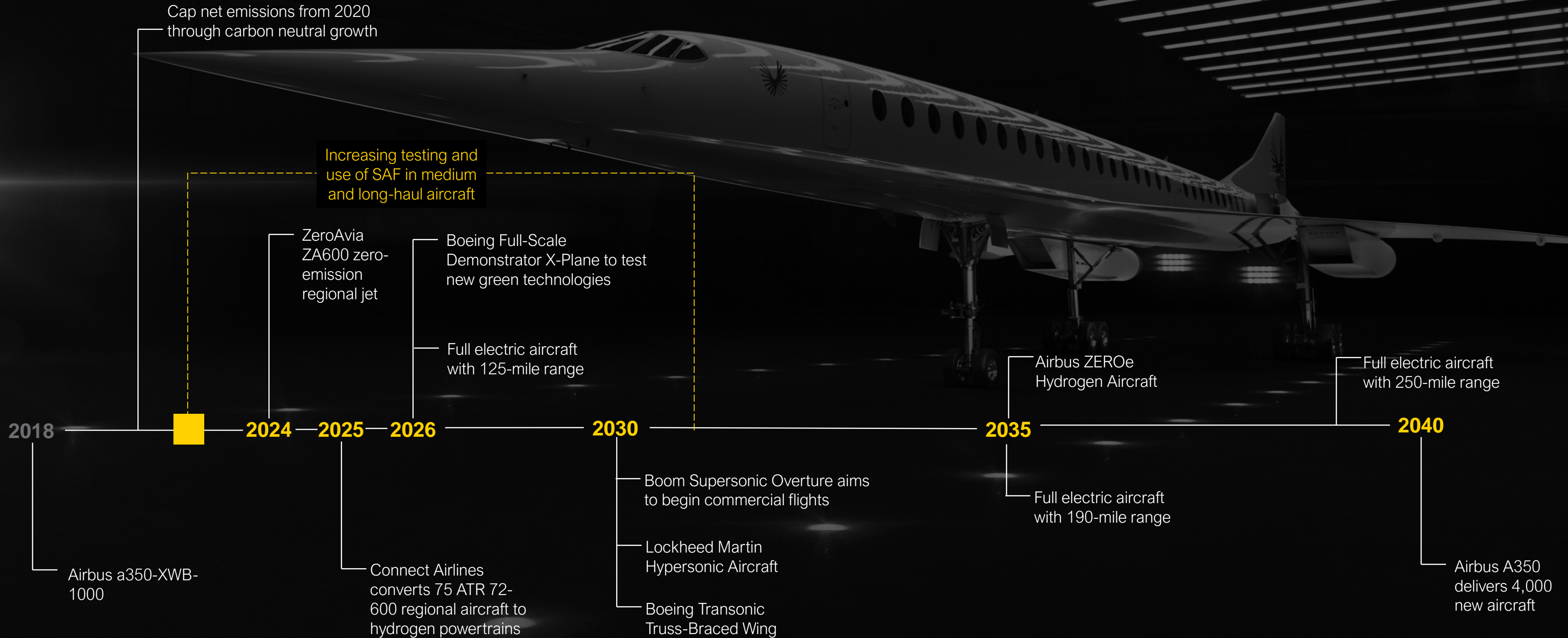
- Annual Demand
- Seasonal Demand
- Design Day Flight Schedule
- Peak Hour
- Fleet Mix + Design Aircraft



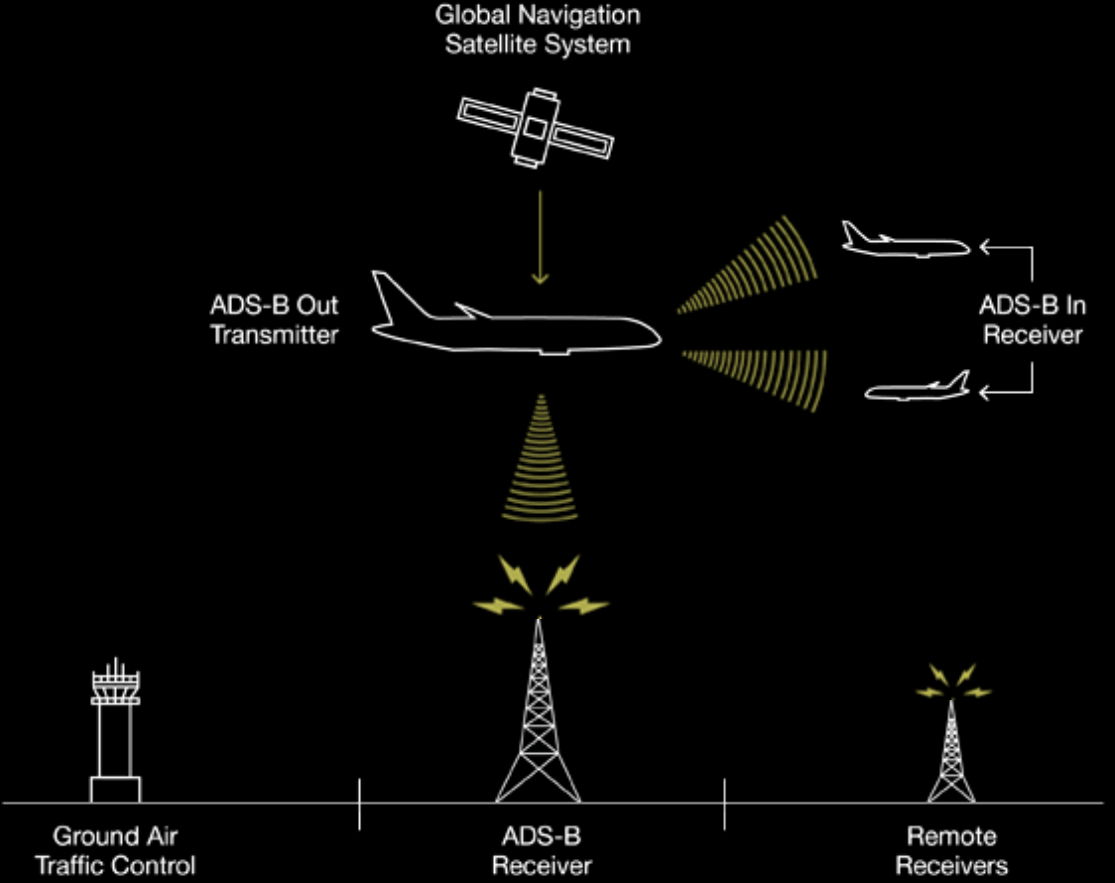
Pre-Planning // Preparing for Future Aircraft Mix

Cap net emissions from 2020 through carbon neutral growth

Increasing testing and use of SAF in medium and long-haul aircraft



Line of Sight // Virtual Control Tower



10hrs

BATTERY LIFE WITH
SEISMIC POWERED
CLOTHING FOR RAMP
WORKER SHIFTS



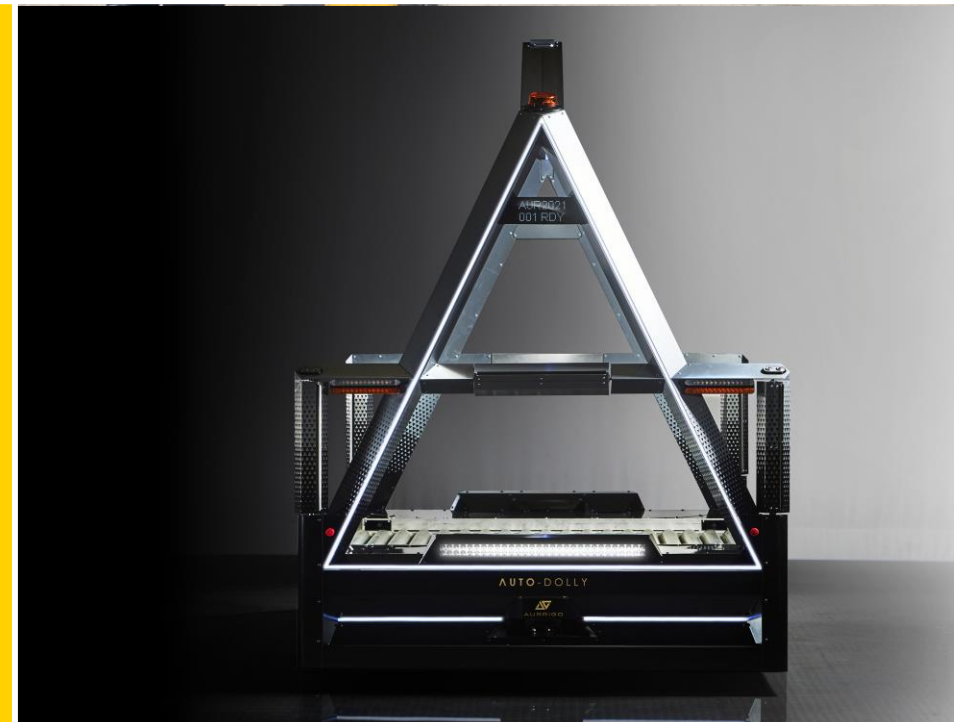
53%

REDUCTION IN PUSH-
BACK RELATED
DELAYS



2024

AUTONOMOUS LUGGAGE
DOLLIES WILL BE UNLOADING
AIRCRAFT AT LONDON
HEATHROW

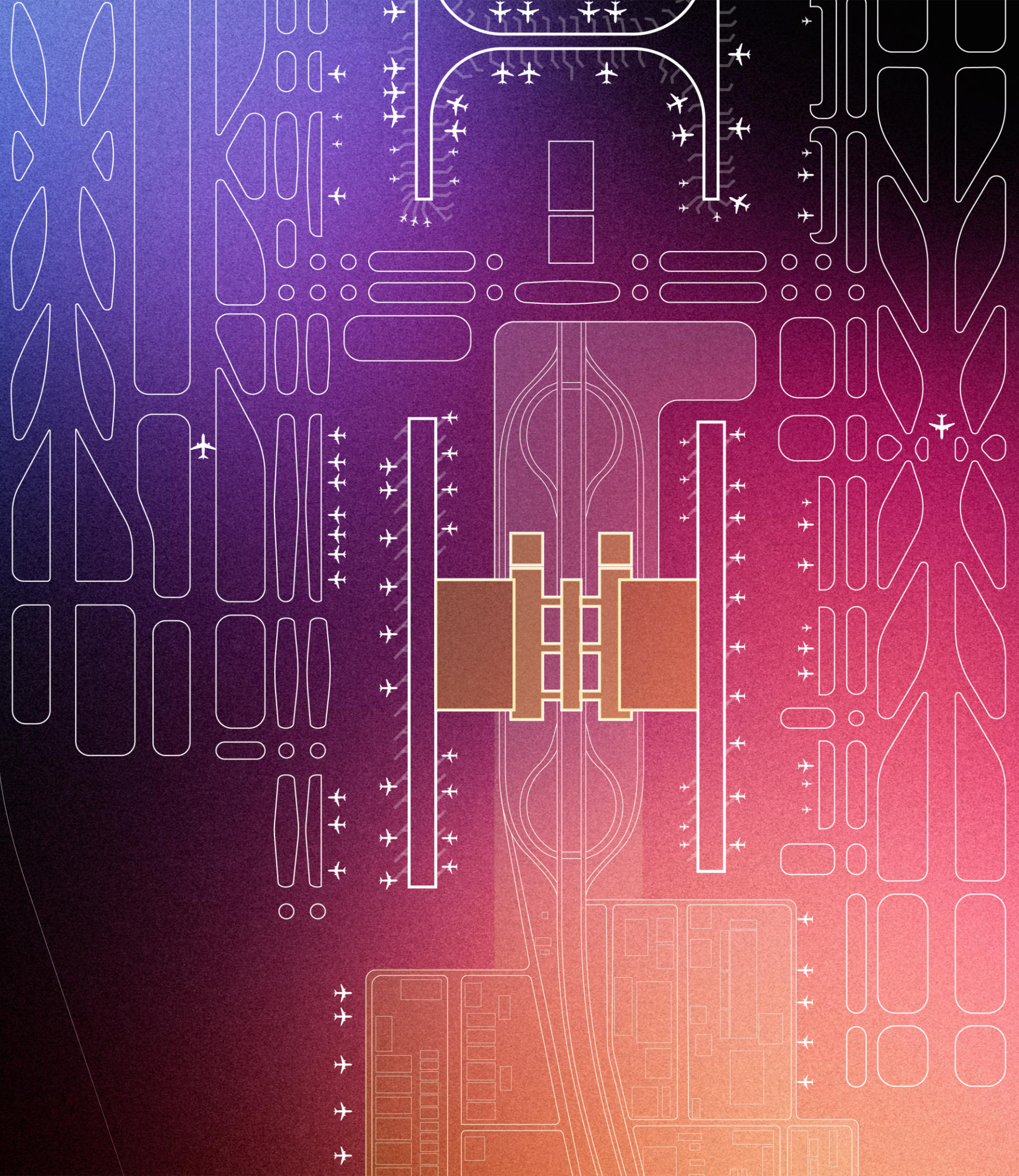


2

TRANSPORTATION

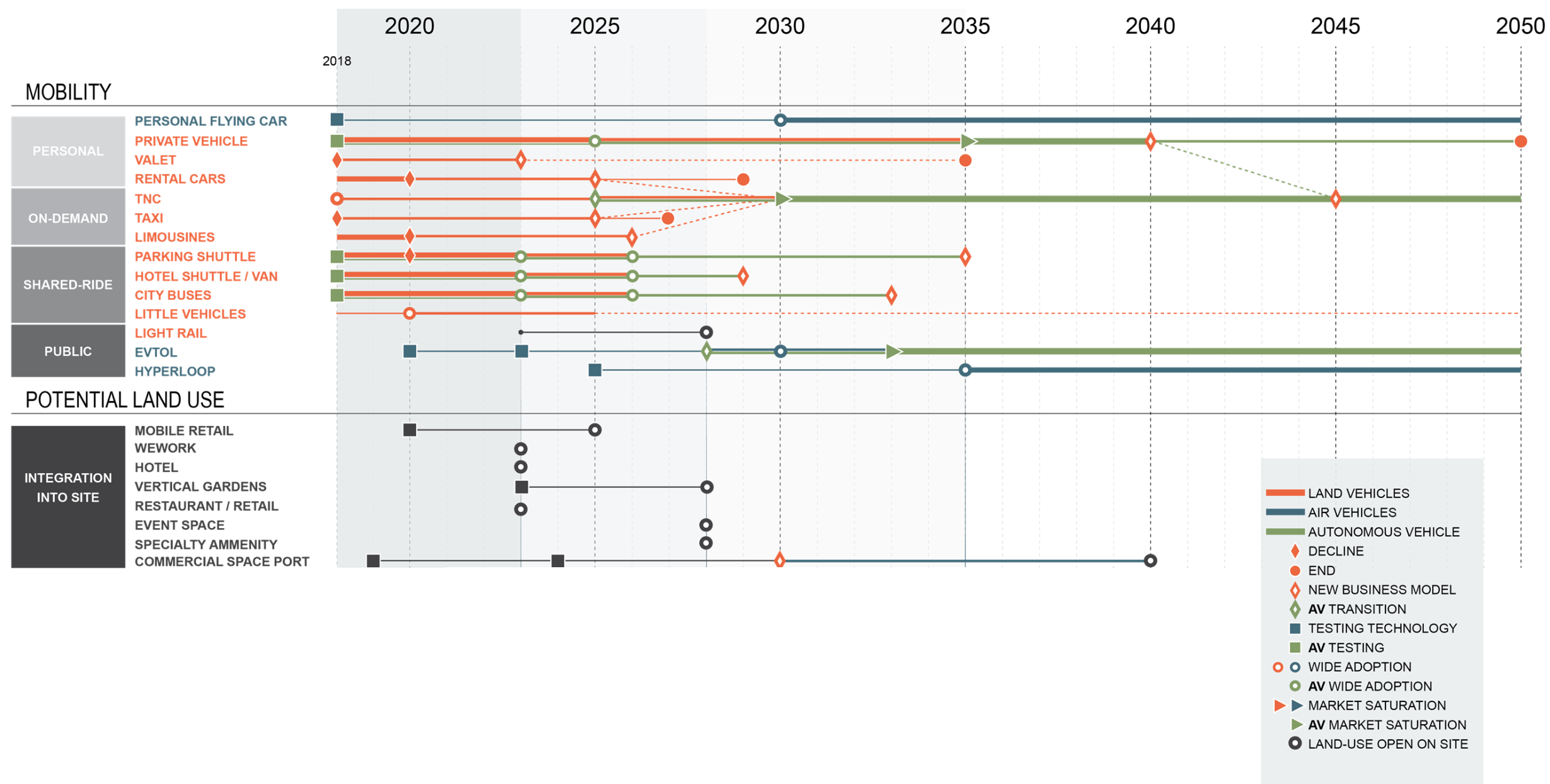
Aviation master planning includes designing and managing transportation systems for moving people and goods around the site.

This will translate to designing and managing space vehicles and lunar rovers, as well as other forms of transportation.



Predictive Design

Anticipating Trends, Curating Futures



Corgan utilizes evidence-based design and historical and current data mining to help predict the behavior characteristics that should be integrated into the programming and design of our terminal facilities.

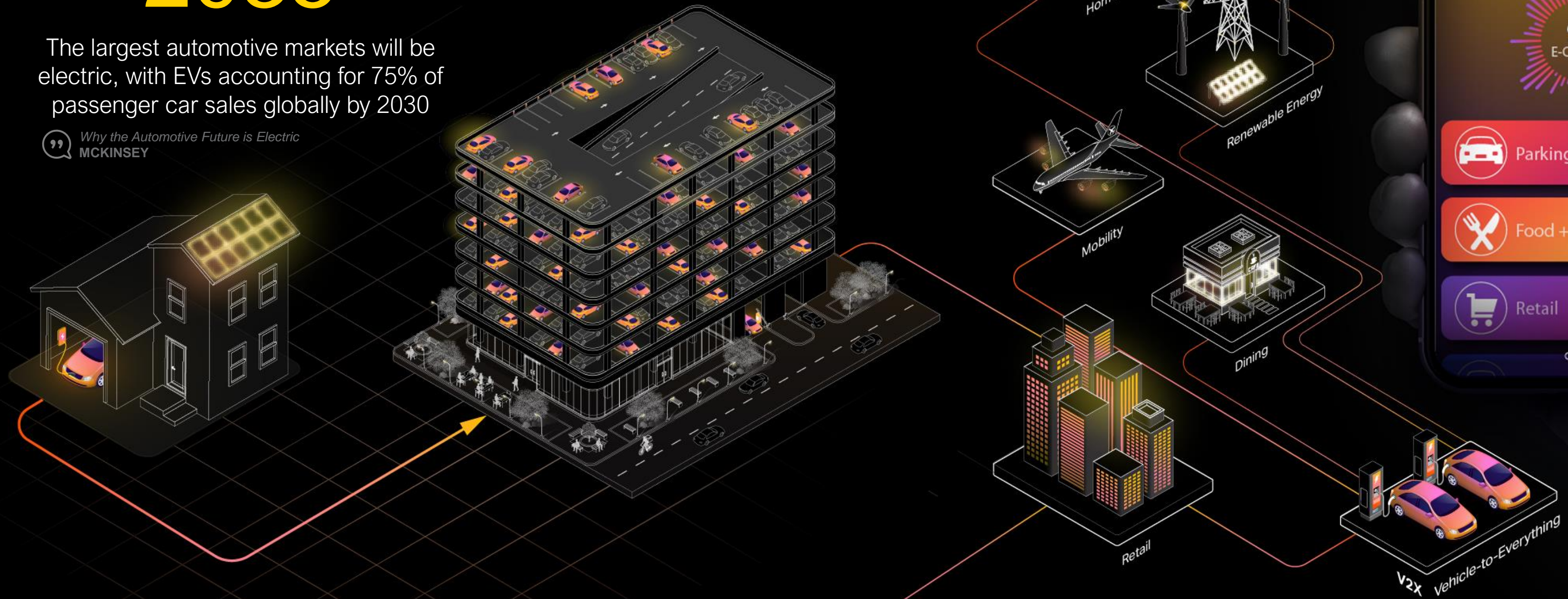
The V2X Parking Garage

An ecosystem change driven by **new user behavior + adoption**

2035

The largest automotive markets will be electric, with EVs accounting for 75% of passenger car sales globally by 2030

Why the Automotive Future is Electric
MCKINSEY



The crucial component in the success of vertical mobility is the **infrastructure** to take-off, land, charge, and service passenger drones



HUGO

Uber Elevate 2019
CORGAN | HUGO



Future of Vertical Mobility
PORSCHE CONSULTING

3

SAFETY + SECURITY

Designing and managing valuable security systems and security protocols is key to ensuring a safe terminal airside and travel for passengers and crew members alike.

Ensuring the safety and security of crew members and equipment is critical for successful lunar exploration and development.

4.9m

Carry-on bags screened for explosives every day in the U.S.

This is What a TSA Agent First Notices About You
READER'S DIGEST

60%

Travelers agree to share data to cut down on wait times and queues

The Airport Delight Report
OAG

VS

Business Travelers prefer automation to human customer service at security

The Airport Delight Report
OAG

6,542

Firearms found by TSA officers at security checkpoints across the US in 2022

TSA.gov

All 313 CT scanning systems to be installed across the U.S. by November 2023

TSA.gov

Biometrics



Digital Twins

Search property

- FLOOR
- DISCIPLINE
- RESPONSIBILITY

ASSETS 57

Level 21 x

Mechanical x Variable Air x

CURTAIN PANEL CORNER GLAZING UNIT LEFT_027
Curtain Panel Corner Glazing Unit Left

CURTAIN PANEL CORNER GLAZING UNIT LEFT_027
Curtain Panel Corner Glazing Unit Left

CURTAIN PANEL CORNER GLAZING UNIT LEFT_027
Curtain Panel Corner Glazing Unit Left

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Curtain Panel Corner Glazing Unit Left

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Curtain Panel Corner Glazing Unit Left

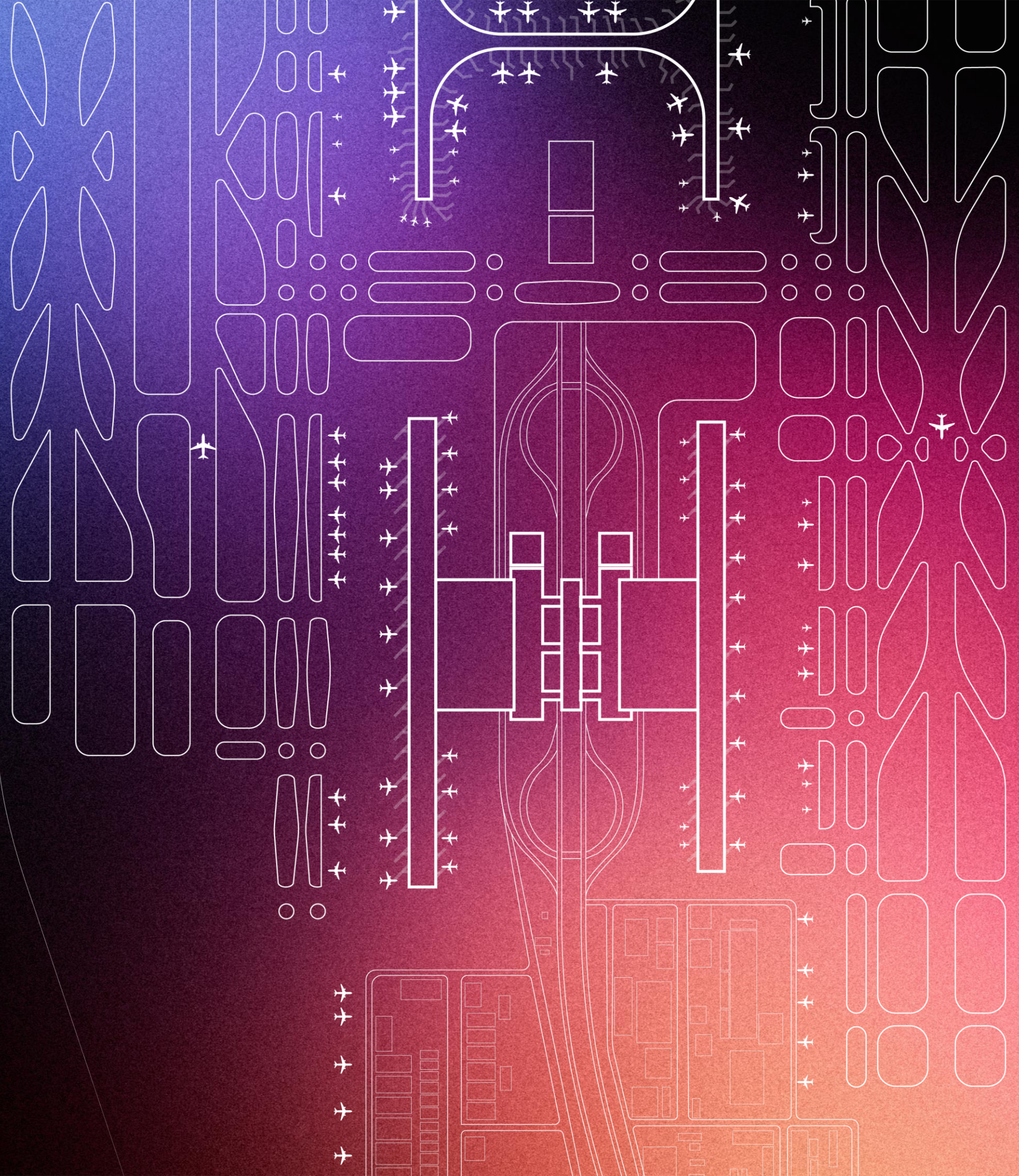
Overview

Discipline	Mechanical	Classification	V1479-SP-ME-00010-05
Expected Replacement Cost	\$1,500	Section	(Mechanical Specification - Rev
Expected Replacement Date	01/06/2035	Serial No	N/A
Category	Variable Air Volume (VAV) Box	Missb No	MSSB-25-01
Type	Variable Air Volume	Electrical Panel Circuit	M-EM-26-07

4

ENVIRONMENTAL PLANNING

Just as it is critical for airports to be designed and managed to minimize environmental impact, a moonbase development must also be planned to minimize the impact on the lunar environment.





Vertical Farming



Renewables



On-Site Carbon Reduction With Vertical Farming

Based on American Airlines flights that are most likely to have food service provided, we identified efficiencies and by using publicly available data, estimated how much carbon can be reduced on-site at DFW

Food Miles Reduction*

212,000 miles

- 142.05 REFRIGERATED TRUCKS
- 1.49K AVG DISTANCE TRAVELED (MILES)

On-site CO₂ reduction*

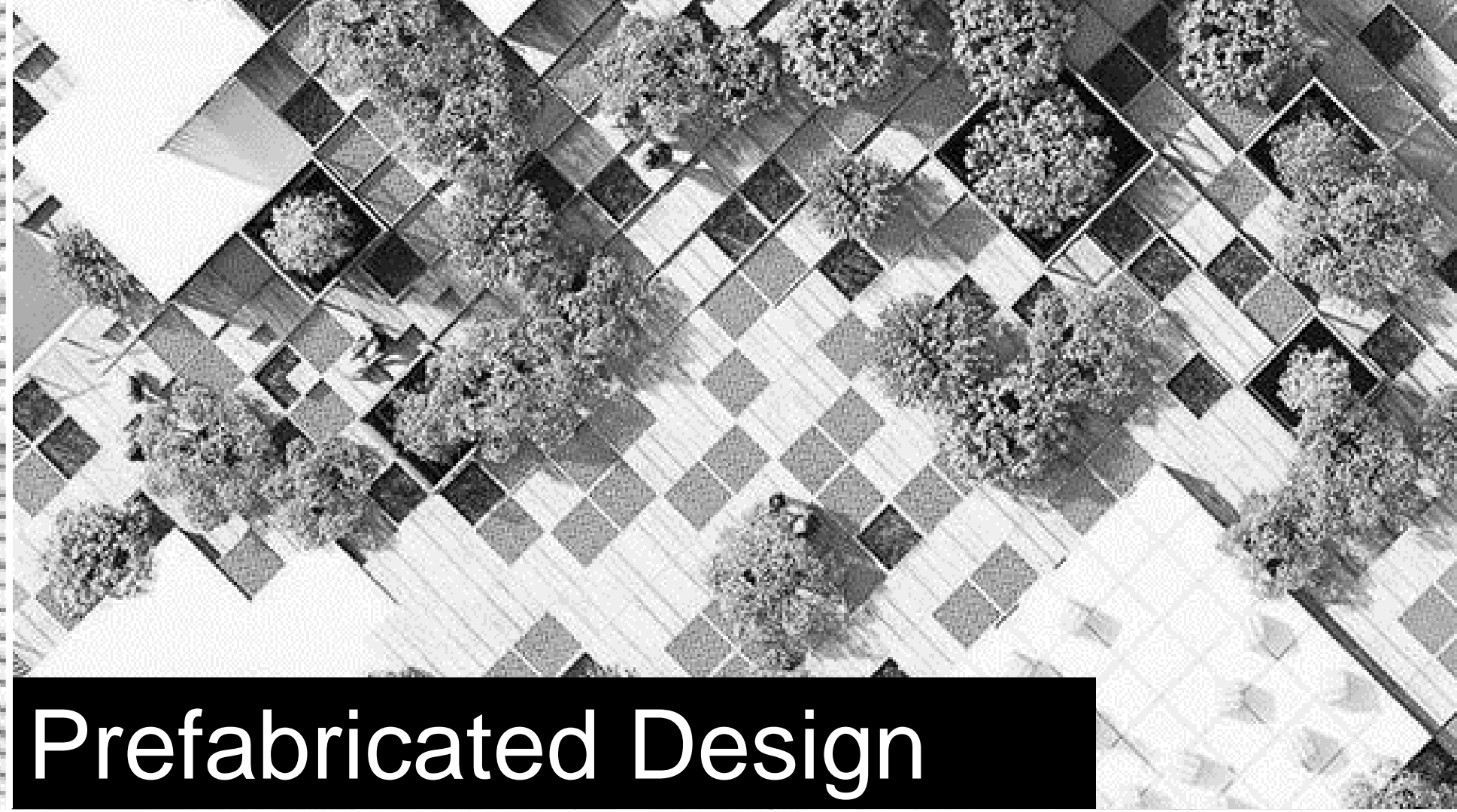
993,440 lbs CO₂

- 142.05 REFRIGERATED TRUCKS
- 426.14K LBS LEAFY GREENS

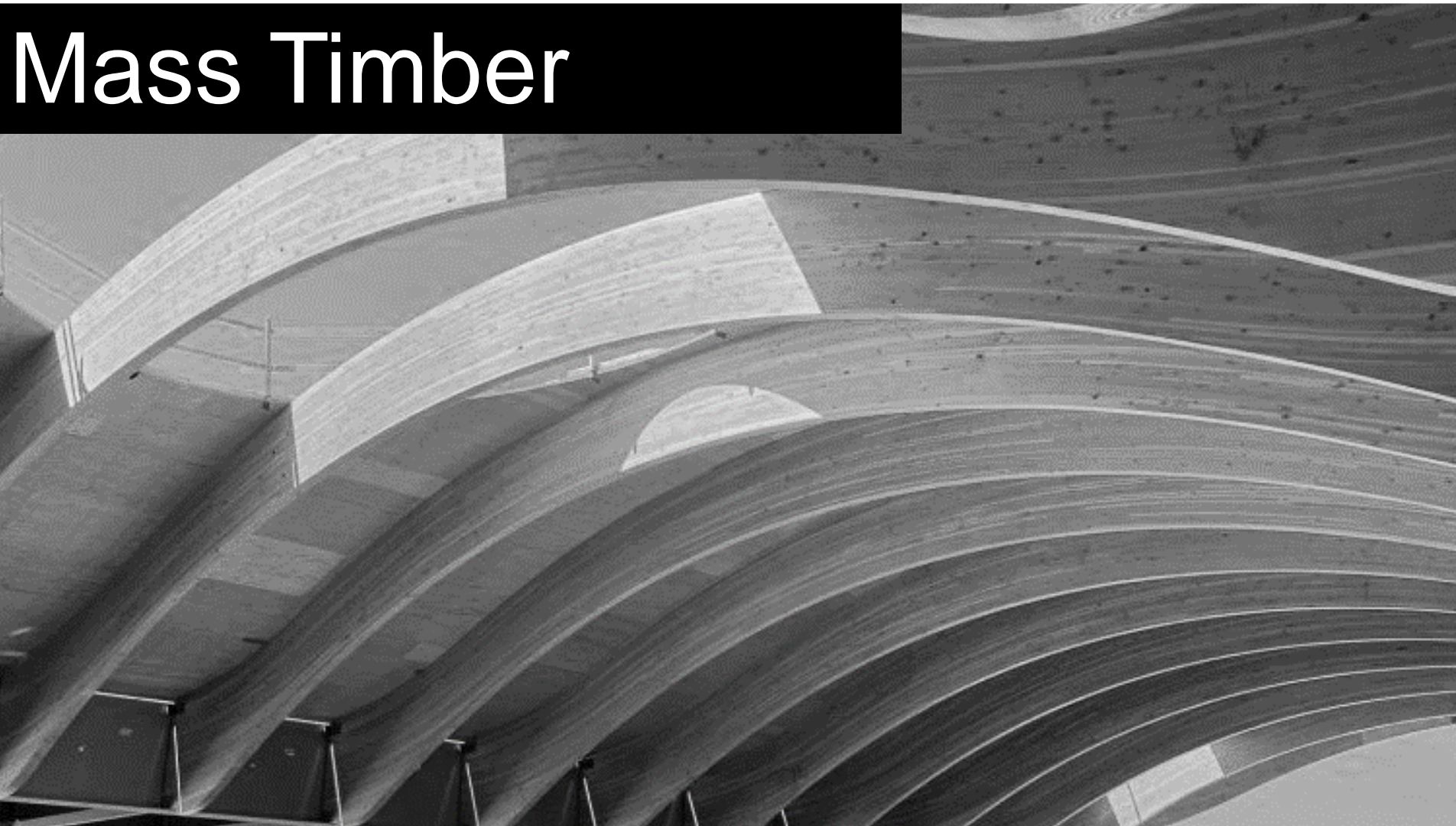


*The model assumes that 50% of passengers order meals, and each meal uses 1/2 a head of lettuce. It also assumes a return to pre-pandemic catering needs.

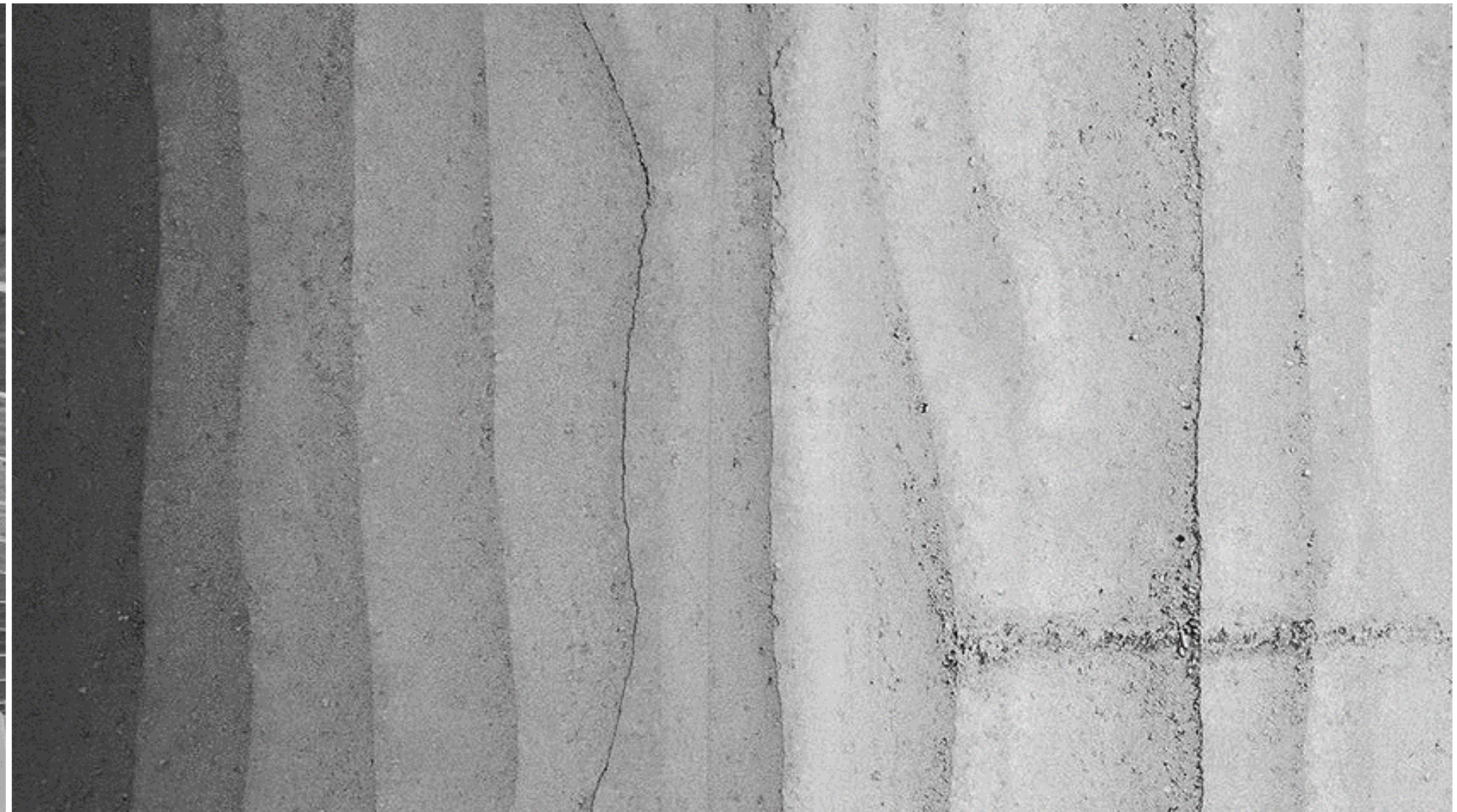
These numbers are calculated on an annual basis



Prefabricated Design



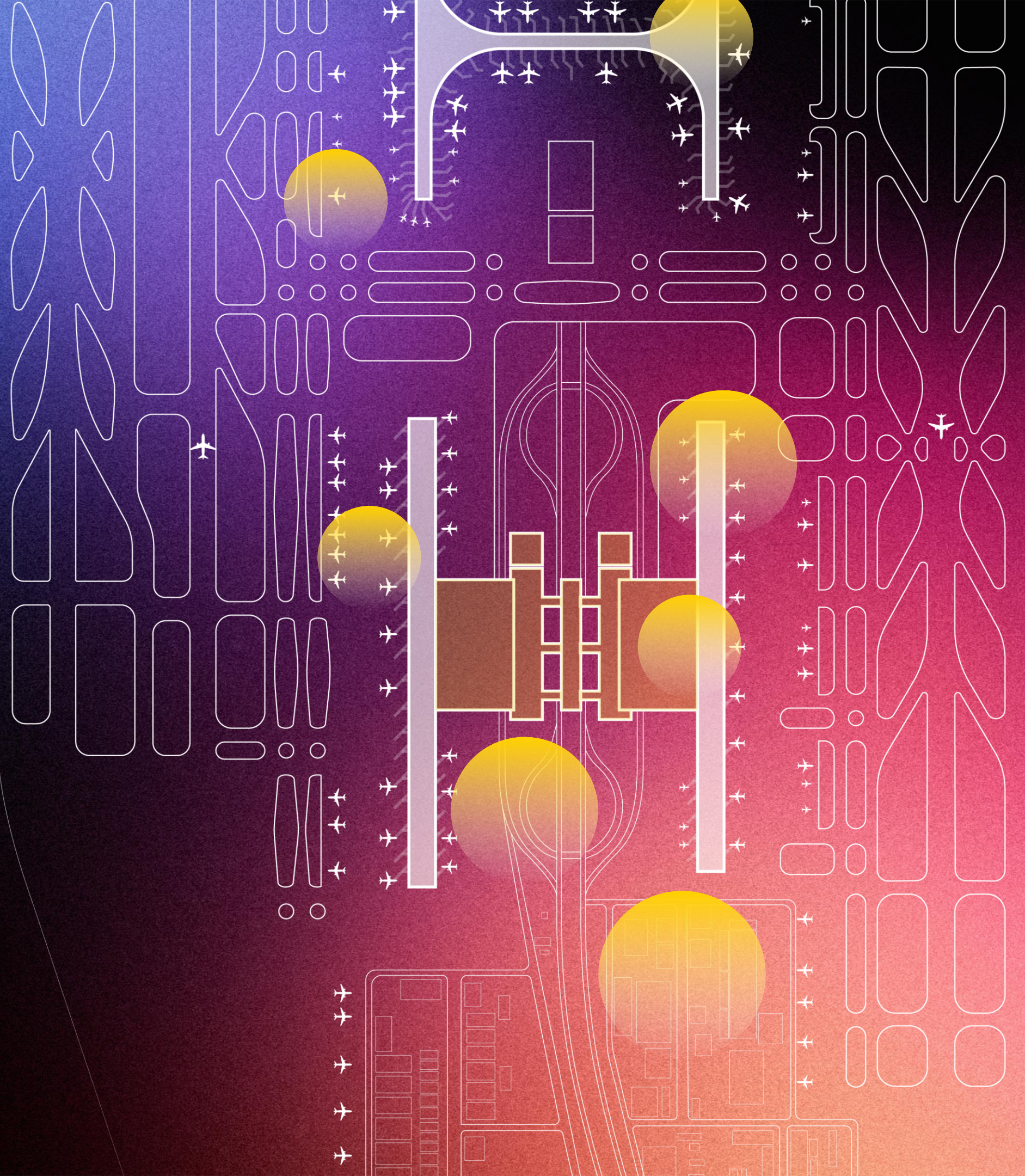
Mass Timber



5

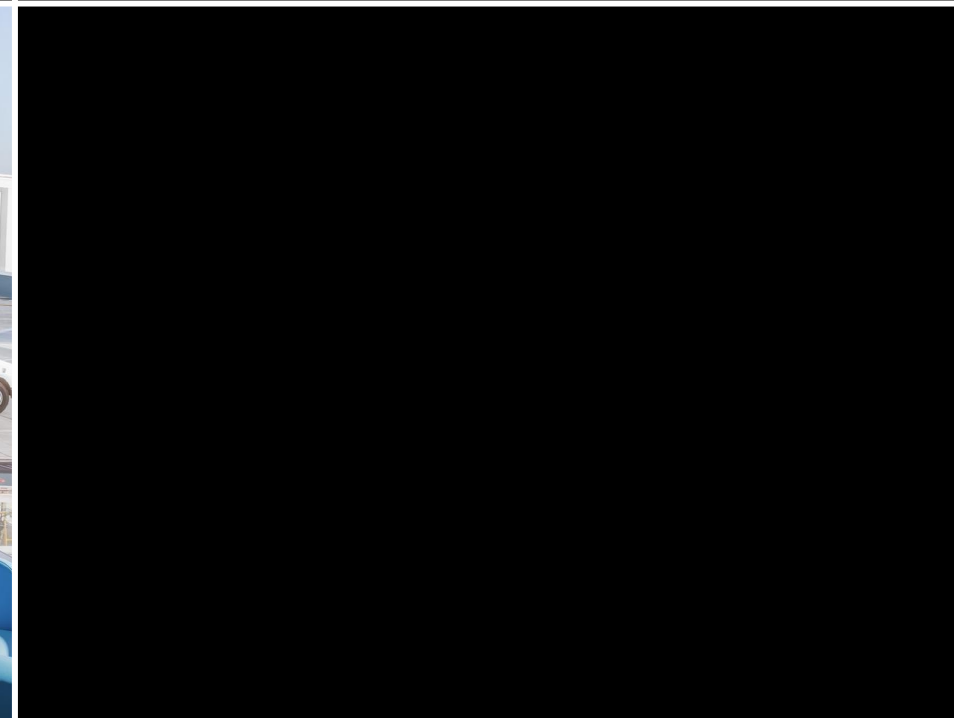
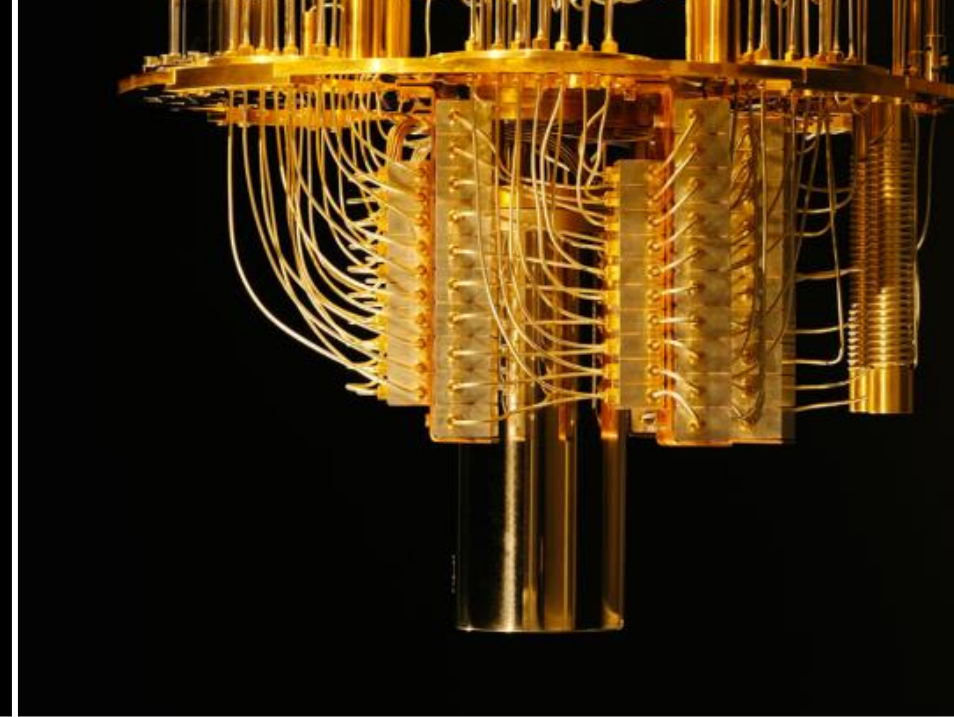
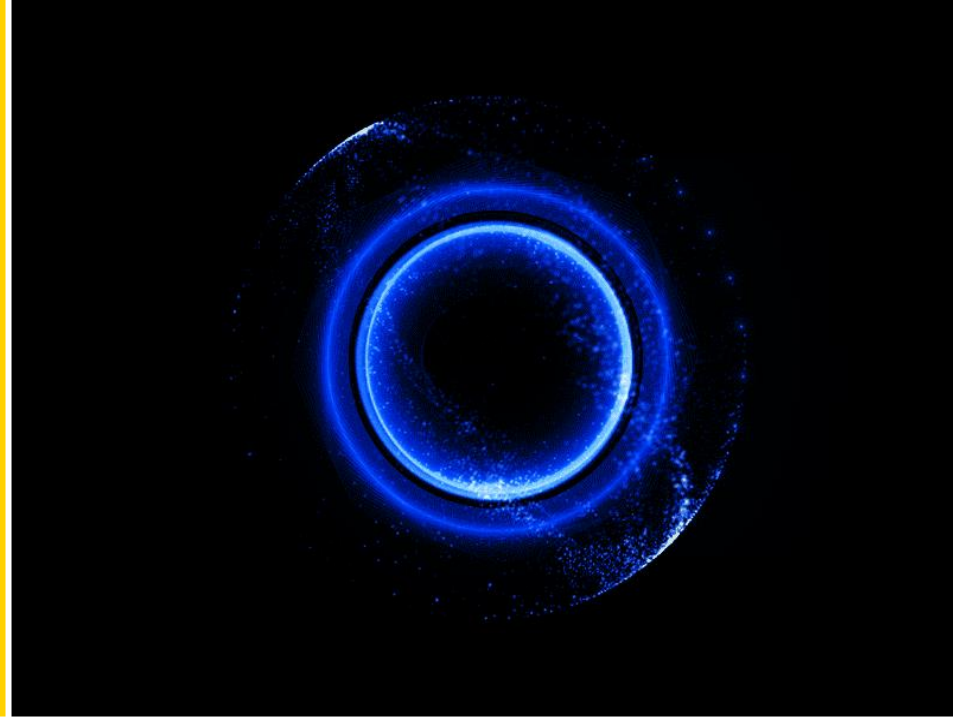
TECHNOLOGY

Aviation master planning must consider evolving and emerging technologies across all aspects of the design, including incorporating A.I., modular construction techniques, robotics, communication systems, and renewable energy systems.



38%

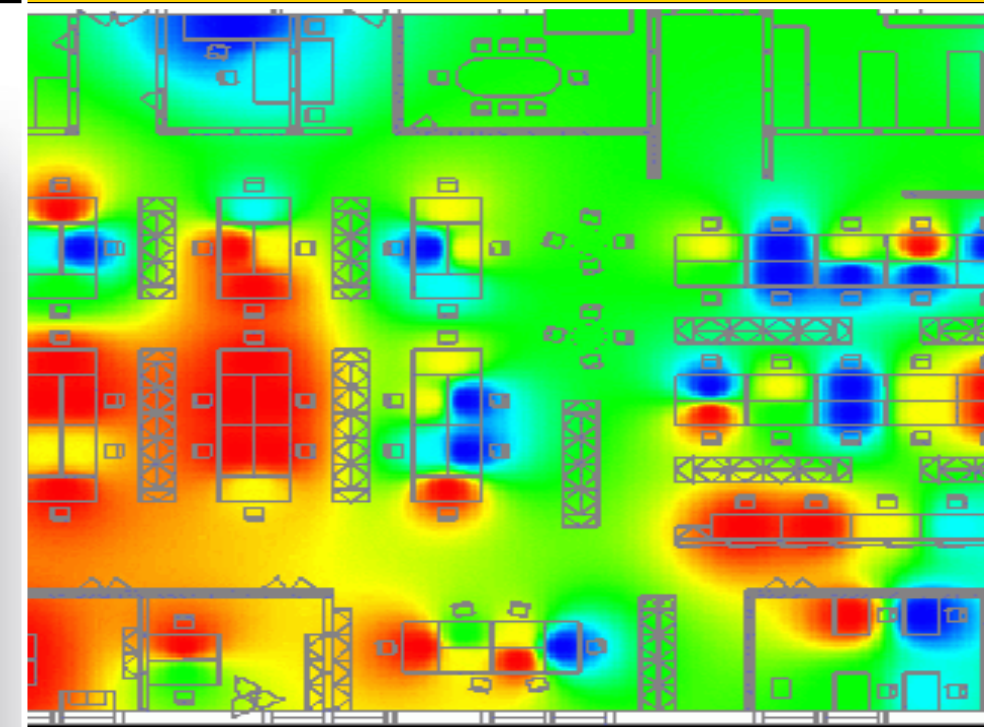
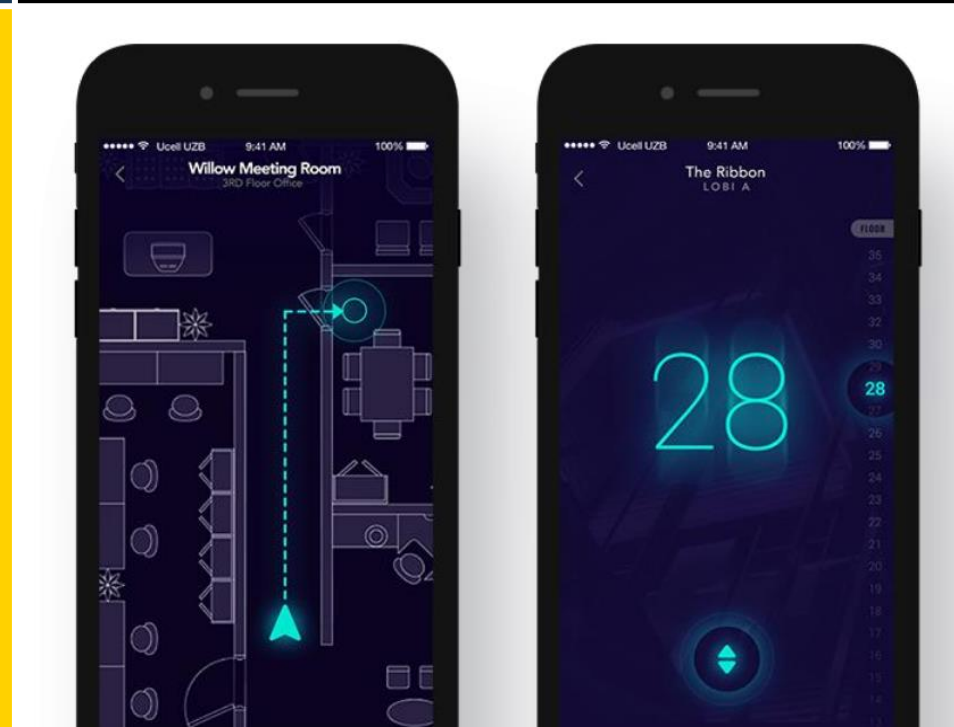
U.S. AIRPORTS PLANNING
ON DEPLOYING AI FOR
CUSTOMIZED MARKETING
IN 2023




2in1
CAFÉ X ROBOTIC COFFEE
BAR KIOSK MAKES TWO
DRINKS IN UNDER ONE
MINUTE



75%
OF THE GLOBAL
POPULATION **WILL BE**
FREQUENT AR USERS
BY 2025



GOOD MORNING, SLOANE

Looks like rain tomorrow in Seattle. 
If you need a jacket, there's a boutique at A4.

DESTINATION

SEATTLE

FLIGHT

DL 2540

GATE

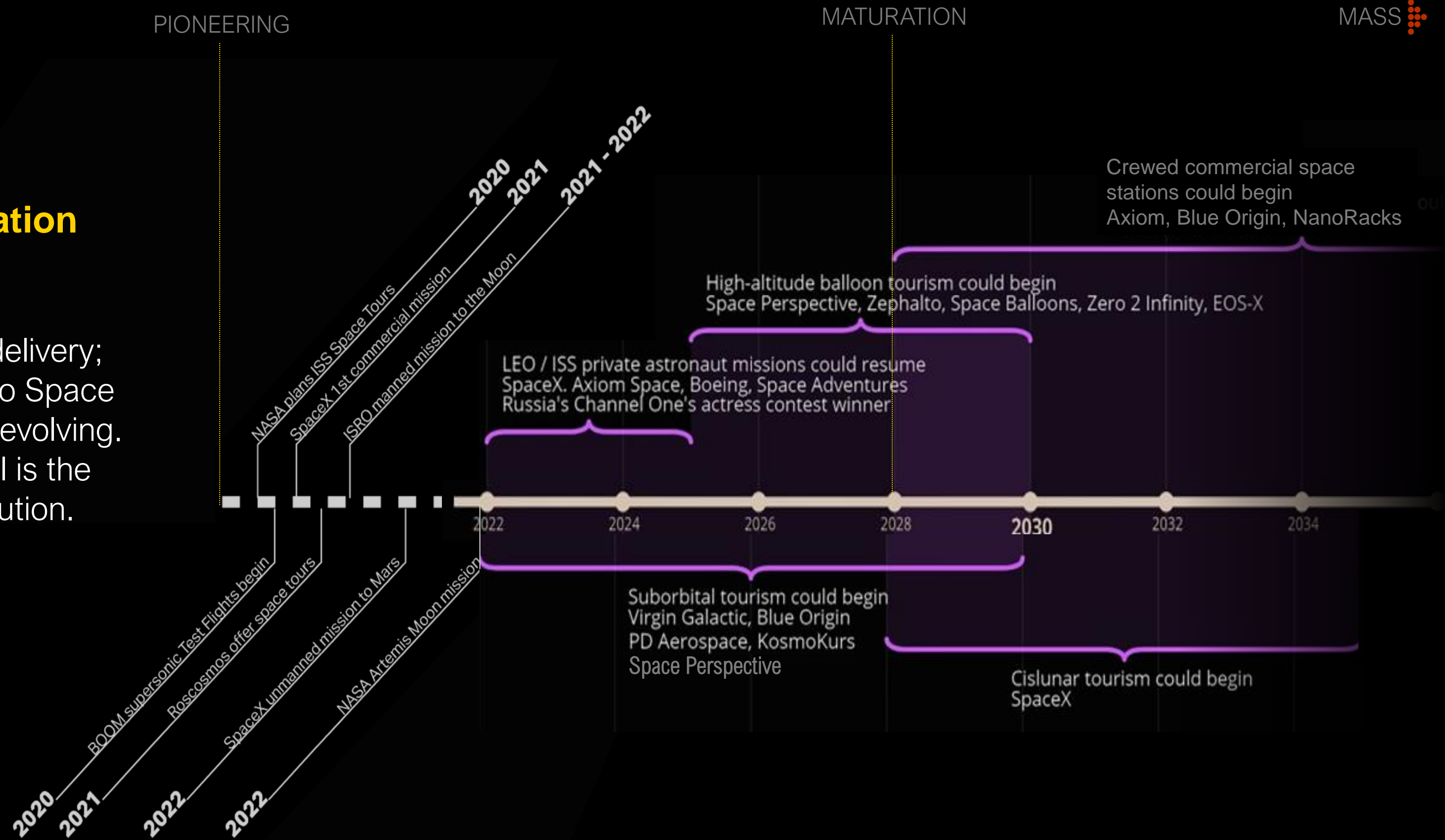
A21

STATUS

ON TIME

The next Transportation Revolution is here.

From eVTOLs to drone delivery; from Boom Supersonic to Space Perspective; airspace is evolving. Commercial space travel is the next chapter of that evolution.

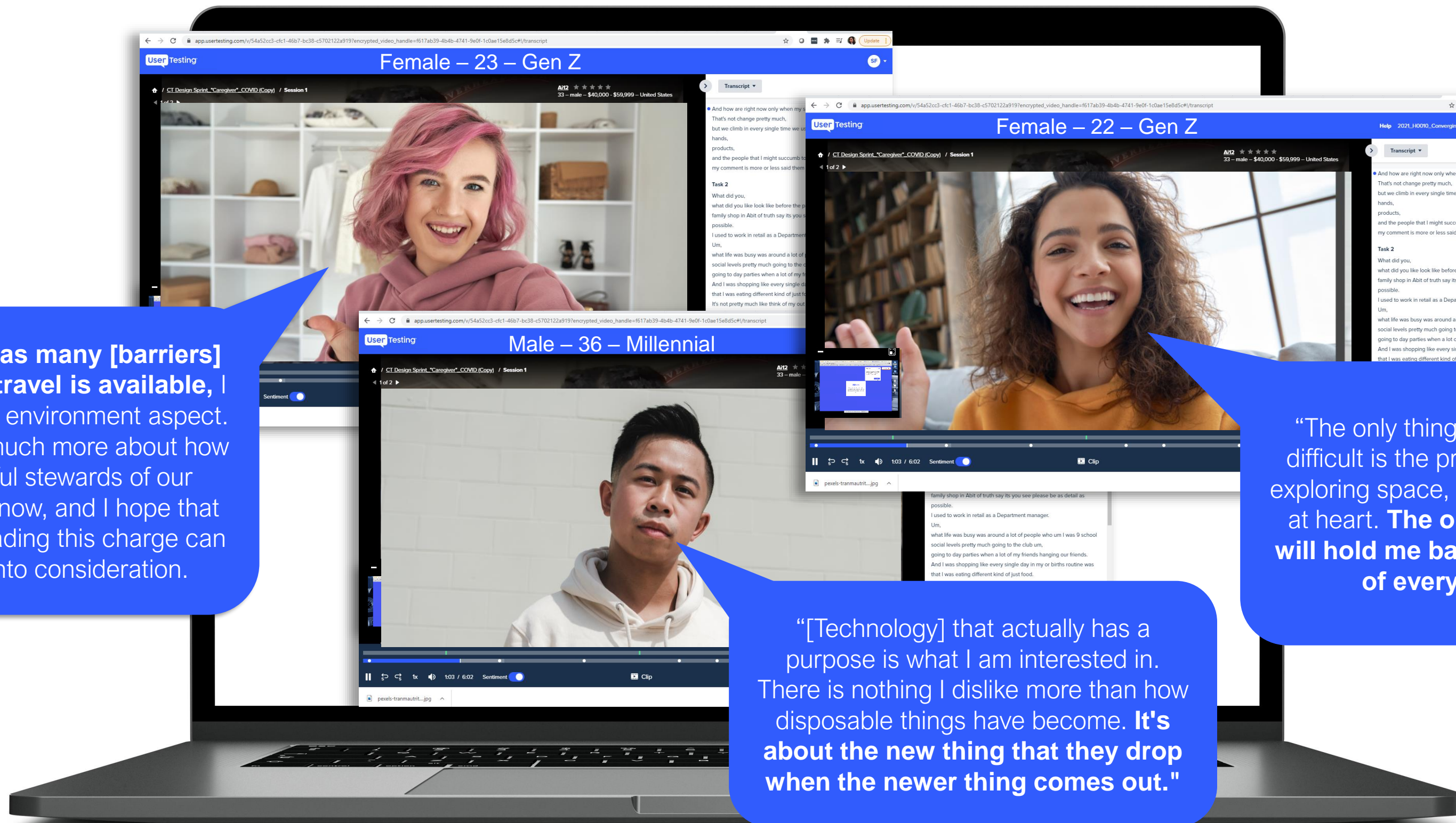


The birth of a commercial space industry will introduce **the average person** to harsh environments traditionally reserved for **highly trained astronauts**

- Zero-Gravity Adjustment
- The Overview Effect
- The Space Fogs
- Isolation



Getting **outside perspectives** is the most powerful tool in the innovation process.



“I don’t see as many [barriers] once space travel is available, I other than the environment aspect. We know so much more about how to be careful stewards of our environment now, and I hope that the people leading this charge can take that into consideration.”

“The only thing I would say is difficult is the price. I am all for exploring space, I am a wanderer at heart. **The only thing that will hold me back is the price of everything.**”

“[Technology] that actually has a purpose is what I am interested in. There is nothing I dislike more than how disposable things have become. **It's about the new thing that they drop when the newer thing comes out.**”

Experiential Data Gathering

Empathize with users by leveraging behavioral sciences tools



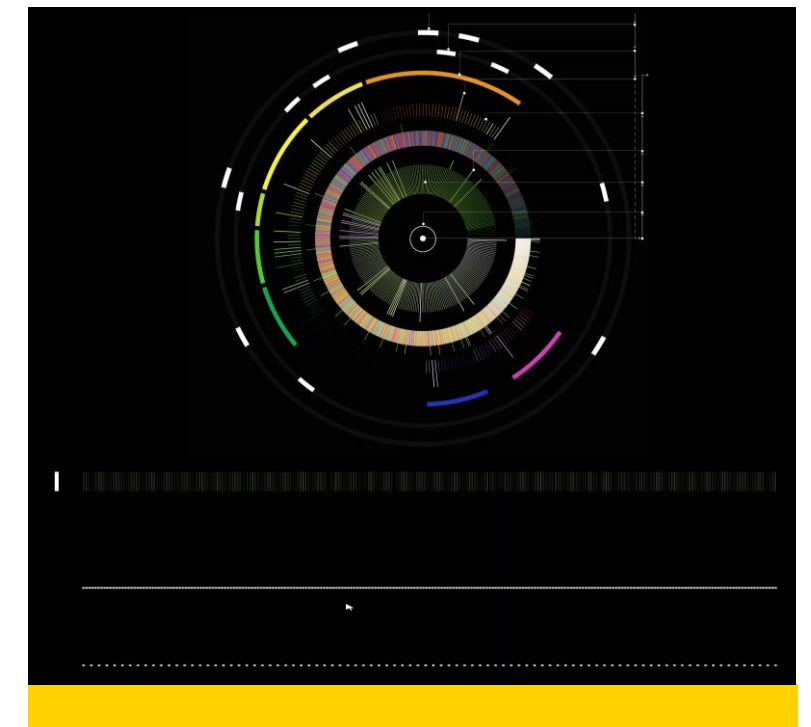
Retina Scanning Goggles



Light Therapy Tools

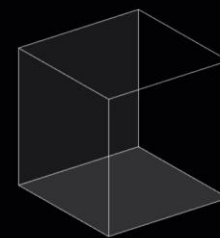
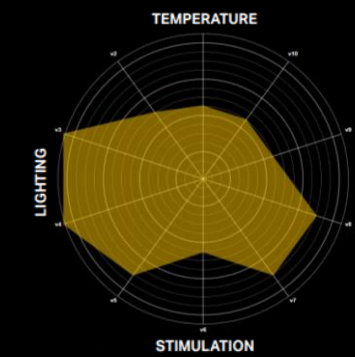
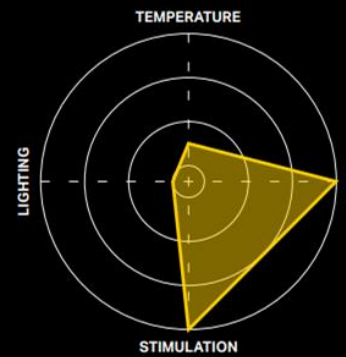
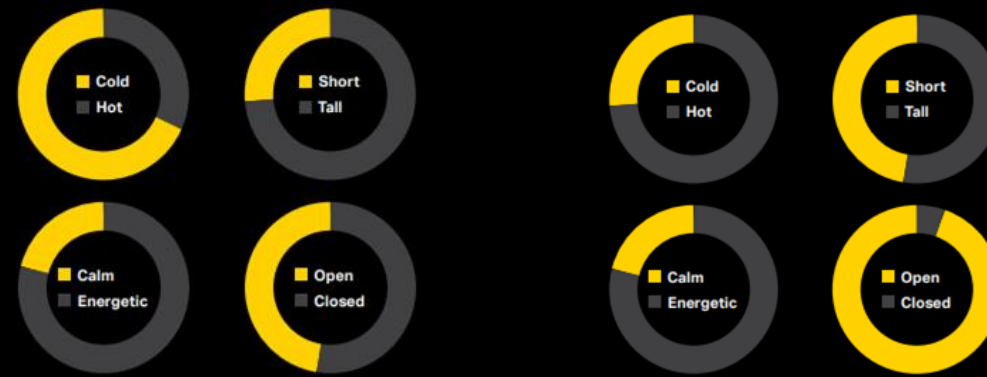
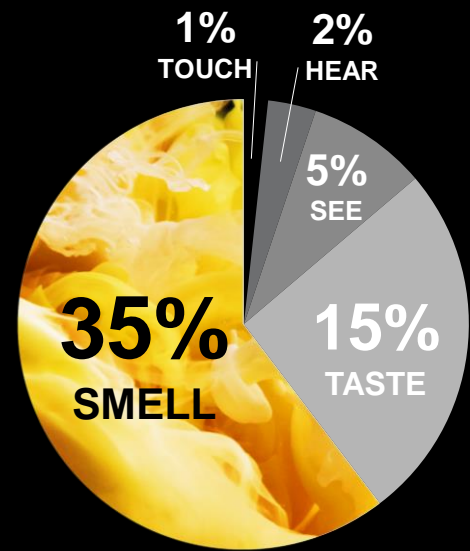


Gerontological Suit

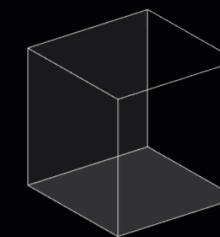


Scentograph™

Olfactory Architecture™ Strategy



EUCALYPTUS



GRAPEFRUIT



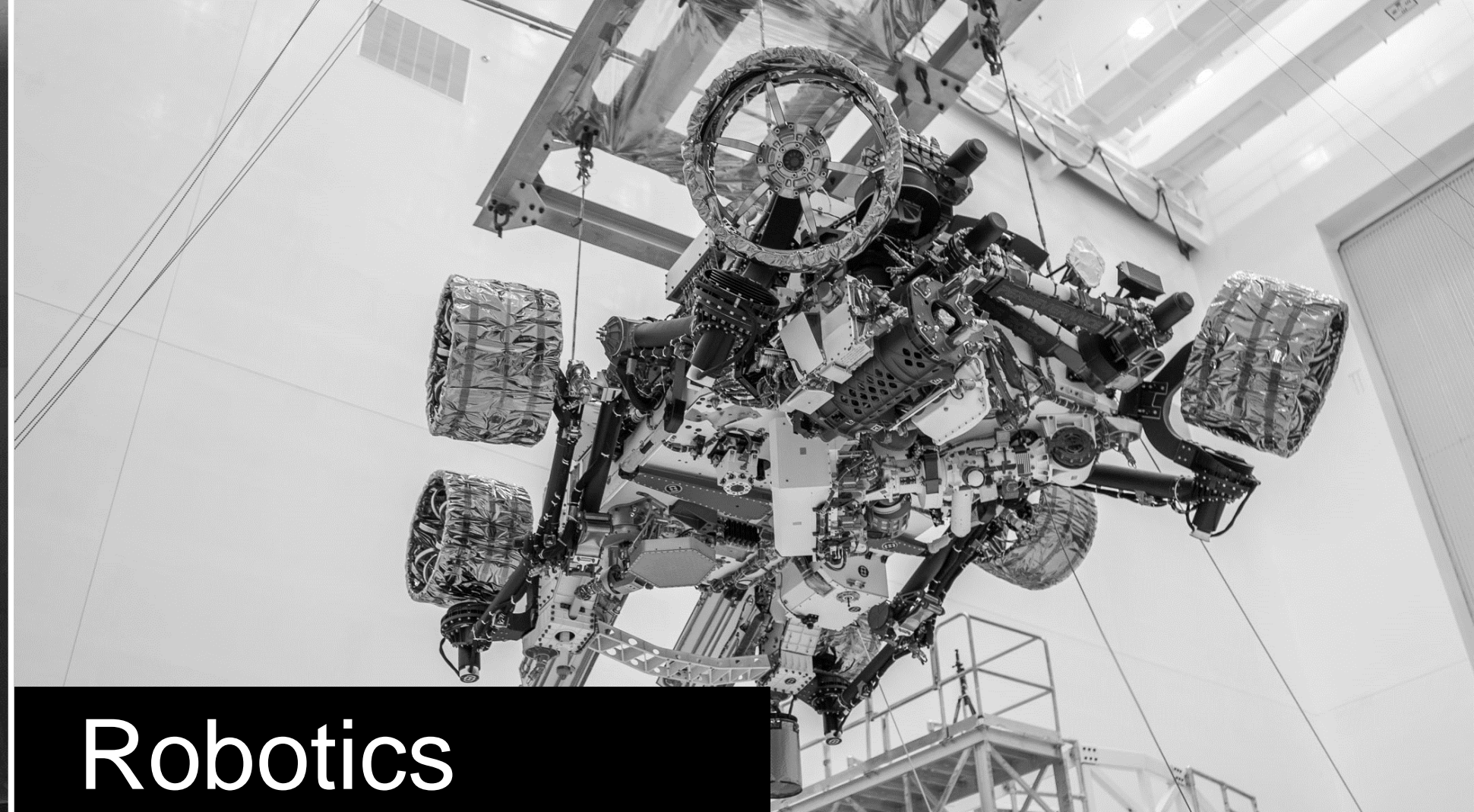
I feel like I am working with Scientists!
 - EXECUTIVE DIRECTOR OF DESIGN (CONFIDENTIAL CLIENT)



Space Medicine



Robotics





Education

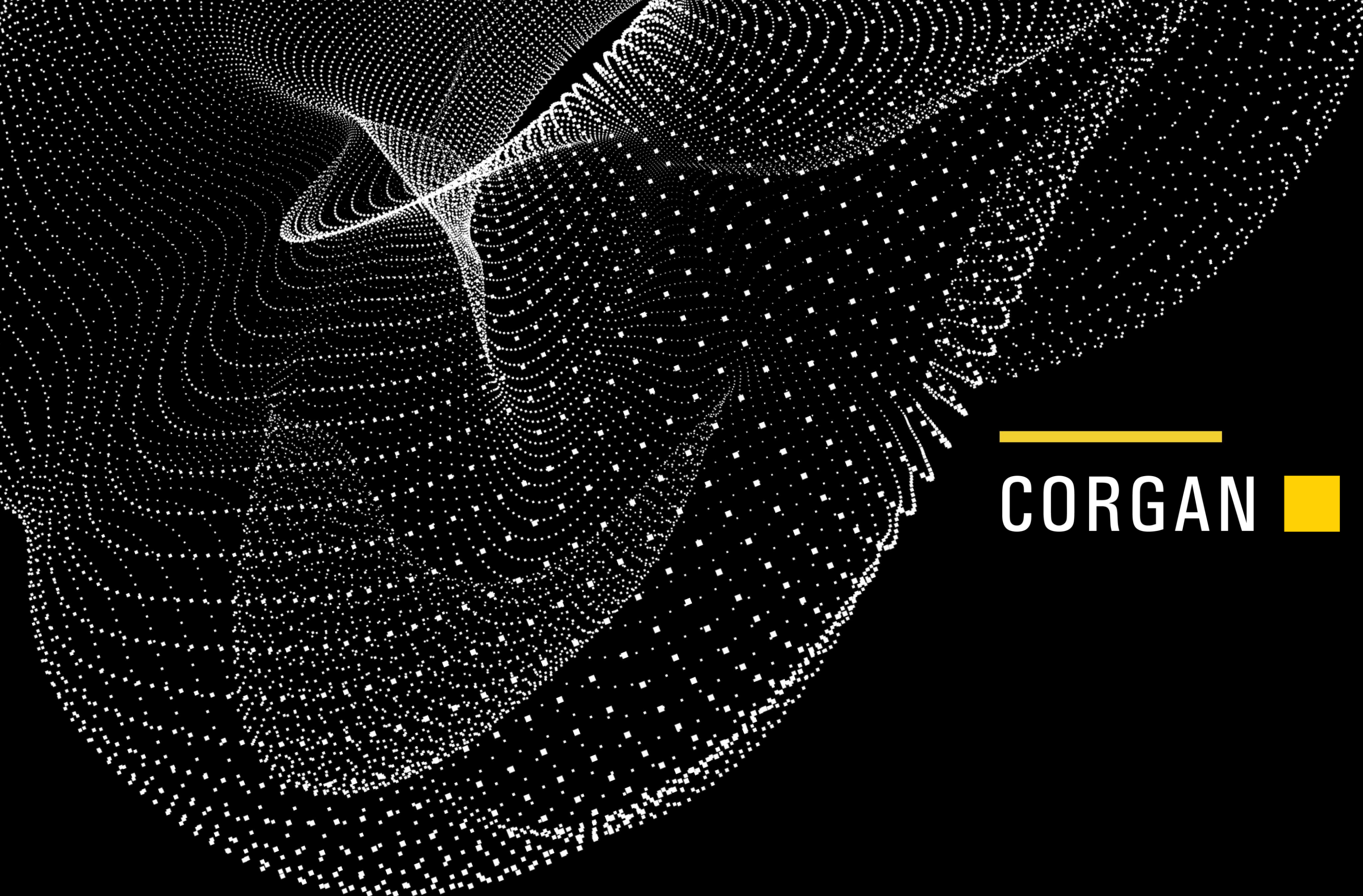


Entertainment



An aerial architectural rendering of a city at night. The scene is dominated by a dark, starry sky. In the foreground and middle ground, a complex network of roads and buildings is visible. The buildings are illuminated with various colors, including blue, purple, and yellow. A prominent feature is a large, multi-colored, abstract structure that resembles a modern building or a public space. The overall atmosphere is futuristic and vibrant. A yellow horizontal line is positioned above the text.

Thank you!



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