



AVIATION TWIN TRANSITION CLUSTER

A EUROPEAN INITIATIVE FOR A SUSTAINABLE FUTURE

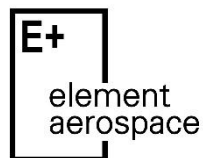


RefMap Clustering Event 2025

Advancing Sustainable Aviation & Urban Air Mobility

What Seaplanes can teach us about Urban Air Mobility

Constantin Tzembelicos, Element Aerospace Ltd



29–30 July 2025, Athens, Greece



Constantin Tzembelicos, P.Eng,
IDP-C

What **Seaplanes** can teach us about Urban Air Mobility.

BEFORE PLANES,
DRONES, AND EVTOL,
WE HAD ANOTHER
WAY TO FLY...

SEAPLANES

1910'

S

ASTRA

FIRST OPERATION
SEAPLANES



1920's



SEAPLANES

DOMINATE

OVERSEAS ROUTES



THE GOLDEN AGE OF FLYING BOATS

1930'

WHY WHERE
THEY SO
PROMINENT
THEN?

LACK OF
RUNWAYS GLOBAL
ACCESSIBILITY
LONG-DISTANCE
TRAVEL



SEAPLANESLAID
THE
FOUNDATION
FOR
INTERCONTINEN

SO, WHAT
HAPPENED
AFTER WWII?

HERE COMES THE JET

1952:



1965

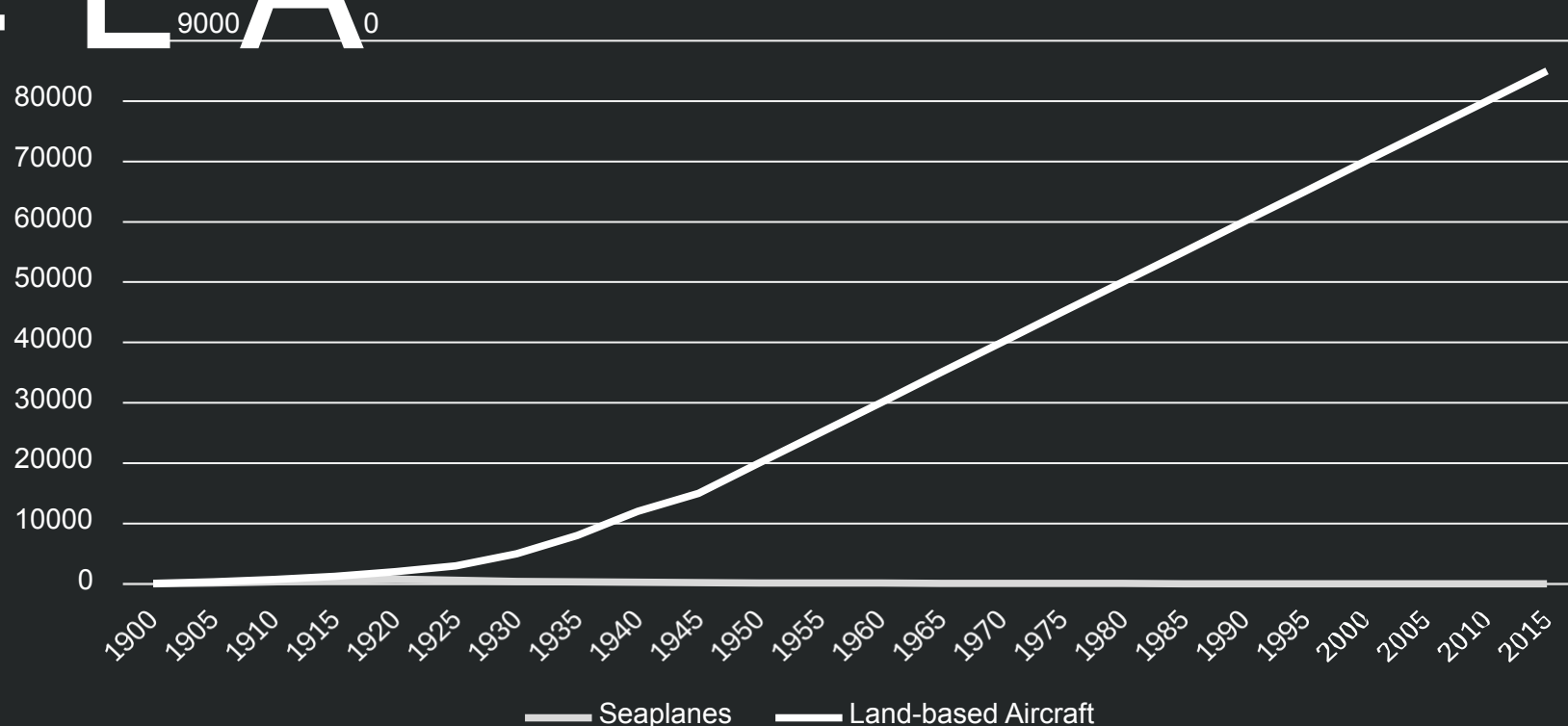
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SUCCESSIO

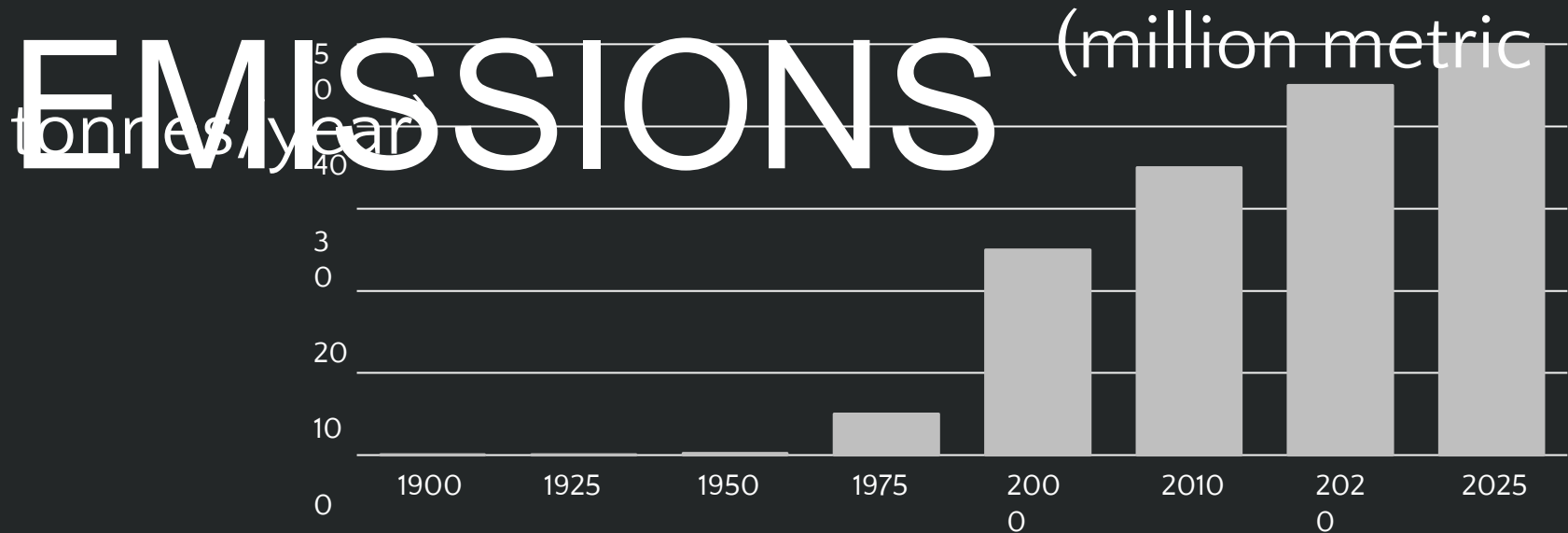
SEAPLANES

NUMBER OF AIRCRAFT
(Global Figures)



Source: Illustrative estimates compiled by the author based on industry trends. It does not represent verified historical records of seaplane or land-based aircraft production or registration

GLOBAL AIRPORT CO₂



Source: Illustrative estimates compiled by the author based on industry trends, informed by ICAO Environmental Reports, ACI Airport Carbon Accreditation data, and public disclosures from major airports (e.g., Heathrow, Schiphol). Not derived from a single empirical dataset

HOW ARE
SEAPLANES STILL
RELEVANT NOW?

MINIMAL

GROUND
INFRASTRUCTURE

0.6



90-15

0

COST PER
ACRE
WATER
AIRPORT VS
CONVENTIO
NAL

10

POINT-TO-POINT TRAVEL



TIME

SAVINGS

VS

SEAPLAN

LAND-BAS

ED

50 70

COST SAVINGS VS SEAPLAN LAND-BAS ED

00 50



ENVIRONMEN TAL

GREAT BARRIER
REEF, LAKE
VICTORIA, GLACIER
BAY, GREAT BEAR
RESRV, TOFINO,
DATACONIA EUU

WILL SEAPLANES
BECOME EXTINCT?
NOT LIKELY....



SEAPLANES WILL
SERVE RURAL,
COASTAL AND
TOURISM-DRIVEN
MARKETS



UAMS WILL
DOMINATE URBAN
SHORT-HAUL,
GRID-CONNECTED
ROUTES

WHAT CAN UAMS
DO EVEN
BETTER THAN
SEAPLANES?



ZERO EMISSIONS QUIETER OPERATIONS

CAS
E
STU

WHAT WENT
SERIOUSLY WRONG
WITH SEAPLANES IN
GREECE....

A black and white photograph of two young children sitting on a low stone wall, viewed from behind. They are looking out over a coastal landscape with a small town and hills in the distance. The child on the left is wearing a striped shirt and shorts, while the child on the right is wearing a dark dress with a cross-back strap. The foreground is covered in dark, textured ground, possibly seaweed or rocks. The text "EVERYTHI" is overlaid in large, yellow, sans-serif capital letters across the middle of the image, and "NG" is overlaid in the same style below it, to the left of the children's feet.

EVERYTHI
NG

LAW
&
REG
S

INVE
ST
MENT

4

EVI
L
SIN

LICE
N
CIN
G

ADO
PT
ION

LAWS & REGULATIONS WHY?

1. FRAGMENTED
DELAYED
REGULATORY
FRAMEWORK.

2. POLITICAL &
ECONOMIC



RANGE MAP OF DHC-6 TWIN OTTER

(120nm on floats ~~without~~ with
pax) refueling

LICENSING & APPROVALS WHY?

3. COMPLICATED
LENGTHY
LICENSING
PROCESS.

4. LACK OF
INTERAGENCY



WATER
AIRPORT
NETWORK

— current
— pending
GROWTH

INVESTMENT & INCENTIVES WHY?

4. INFRASTRUCTURE AND INVESTMENT GAPS.

5. MARKET UNCERTAINTY

WATER
AIRPORT
INFRASTRUCTURE

3

LICENSED

4

12

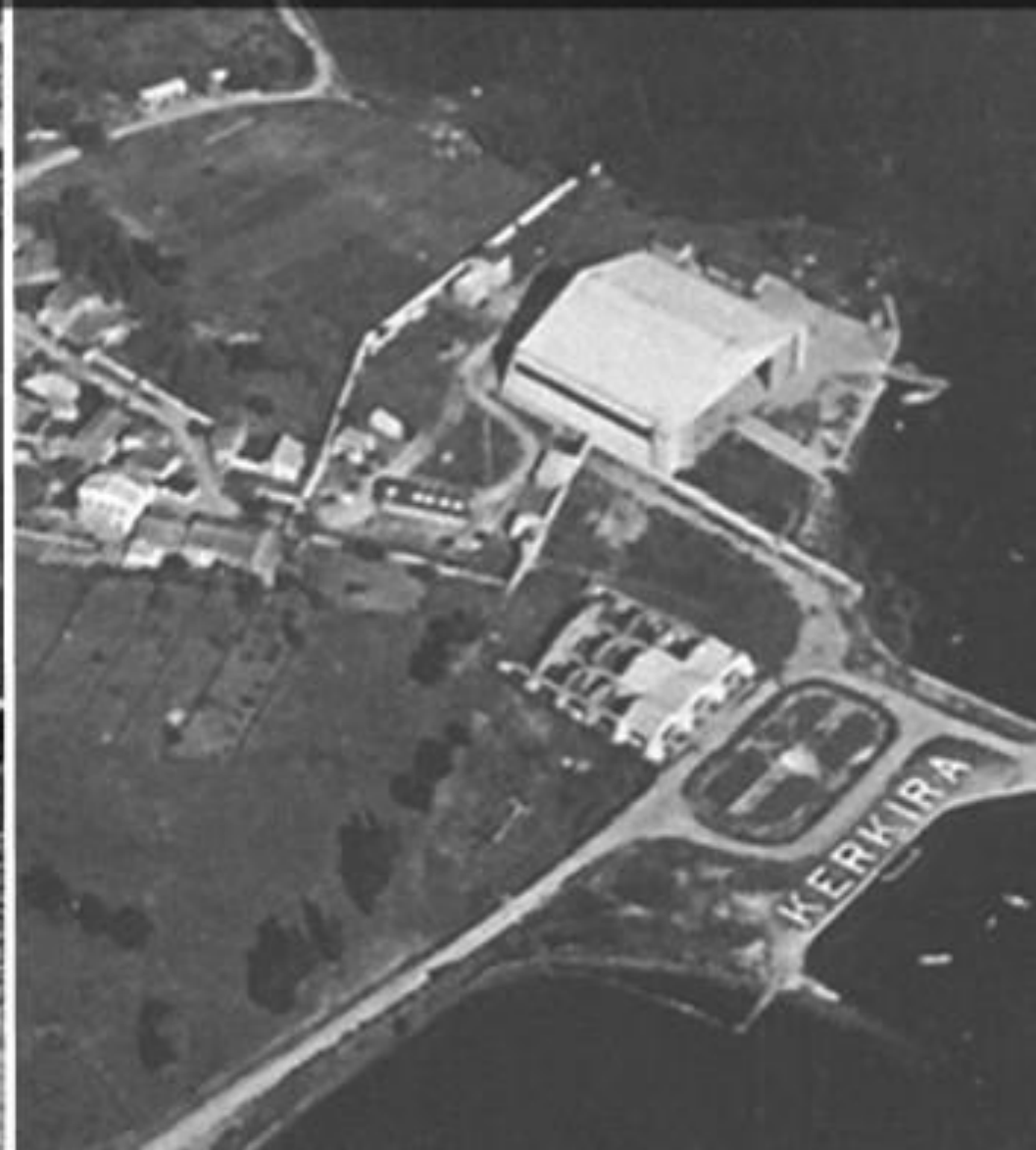
PUBLIC
ACCEPTANCE WHY?

7. ENVIRONMENTAL
AND PUBLIC
OPPOSITION.

8. COMPETITION
WITH FERRIES.

LOOKING
BACK

□ Faliro Harbour and Corfu Water Airport in the 1920's



DO
NOT
REFPE

CHALLENGE

PARALLELS

BETWEEN

SEAPLANES AND

UAMs



INFRASTRUCTURE

PLAN AT A NATIONAL
LEVEL SET
STANDARDS EARLY
PRE-LICENCING
TOP-DOWN
APPROACH
POWER GRIDS



REGULAT ORY AIRSPACE

LEVERAGE
PROVEN
PROTOCOLS
KEEP REGULATORY
BURDEN
PROPORTIO
NAL
INNOVATE



PUBLIC ACCEPTANCE



BUILD TRUST
EARLY RESPECT
PRIVACY MAKE IT
AFFORDABLE
ADDRESS PUBLIC
SAFETY
LOCAL



LIABILITY FRAMEWORK

DEVELOP PUBLIC
ADVISORY BOARD
DEMONSTRATION
FLIGHTS

INCORPORATE
NEXT-GEN TOOLS
EDUCATE



LIMITED
OPERATING
HOURS.

RESPECT
COMMUNITY
RHYTHMS
START NARROW,
SCALE
SMART
INTEGRATE WITH

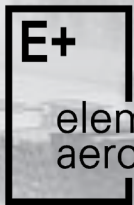
UAM STRATEGY
FROM SEAPLANE
LESSONS
LEARNED.

A. IMPLEMENT A
TOP-DOWN
REGULATORY
APPROACH.

B. INVEST IN
INFRASTRUCTURE

C. ENSURE
PUBLIC AND
COMMUNITY
BUY-IN.

D. STREAMLINE
MULTI-AGENCY

An aerial, grayscale illustration of a futuristic urban landscape. A large, modern airport terminal with a long, low profile and a glass facade is the central focus. Several aircraft are visible: a seaplane on a circular landing pad in the foreground, a small propeller plane on the terminal's roof, and another aircraft in the sky. The city is composed of various building types, and a dense forest covers the background hills.

SEAPLANES DIDN'T
SCALE.
FOR FUTURE
MOBILITY,
LESSONS DID

**thank you
for your attention!**

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For more information:
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**Q&A /
Closing**





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