



**ABOUT 10**  
BILLION HUMANS  
IN 2070 WITH  
1/3 IN AFRICA



**50 %**  
WORLD IS NOW PART OF  
THE MIDDLE CLASS

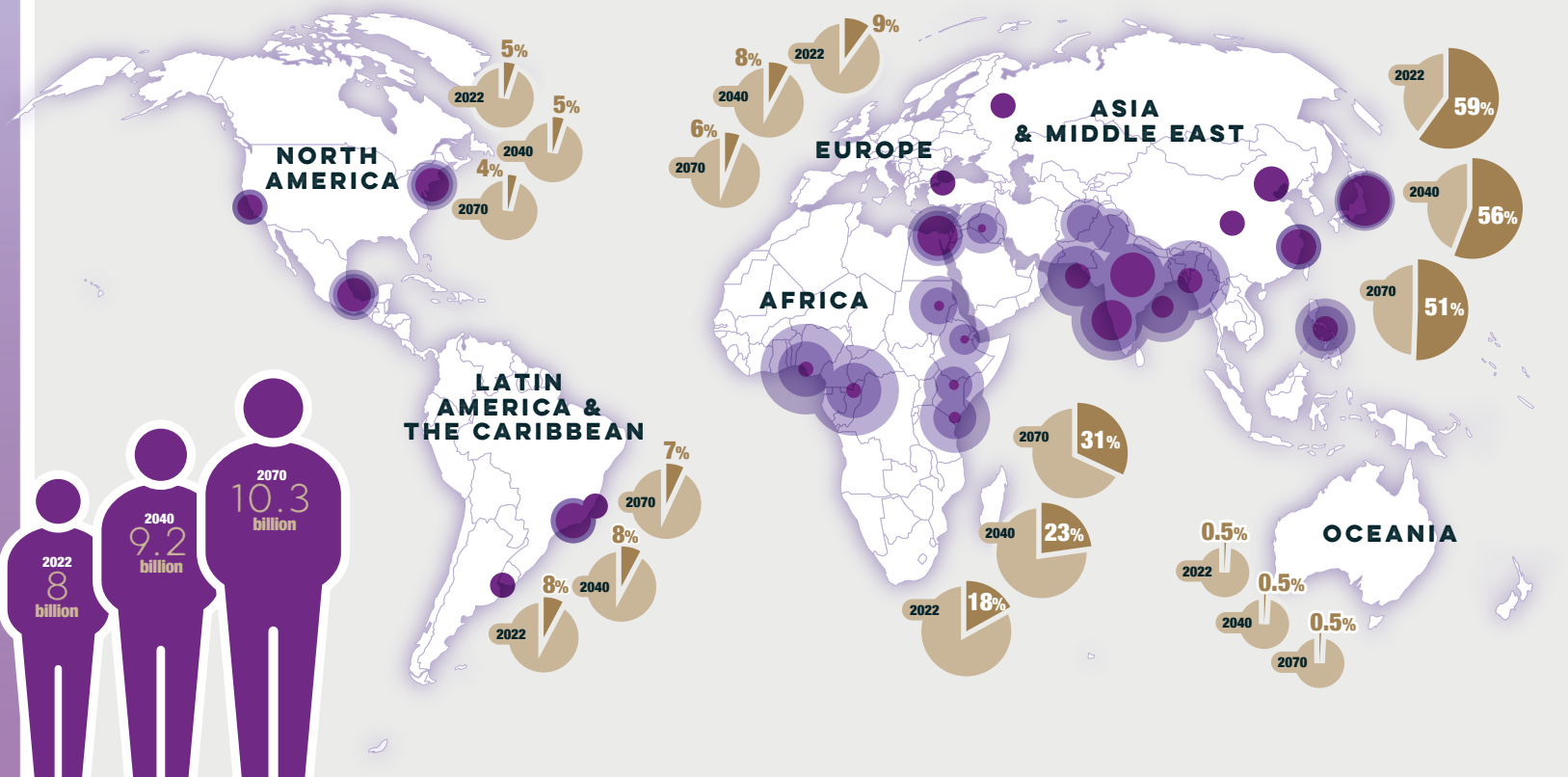


**68 %**  
OF THE POPULATION  
WILL BE  
URBAN  
BY 2050.

## THE WORLD IN 2040 AND 2070

EVOLUTION  
OF THE WORLDWIDE POPULATION  
2022-2070

THE 20 LARGEST  
METROPOLITAN AREAS  
FROM 2022 TO 2070



LIFE EXPECTANCY INCREASES.  
NEW TECHNOLOGIES  
ARE CHANGING OUR LIFE.  
**AIRPORTS NEED  
TO ADAPT  
TO THESE  
NEW PARADIGMS.**



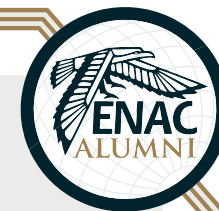
REGIONAL  
**OPEN SKY**  
AGREEMENTS  
ARE ESSENTIAL  
TO DEVELOP THE OFFER  
AND REDUCE AIR FARES.



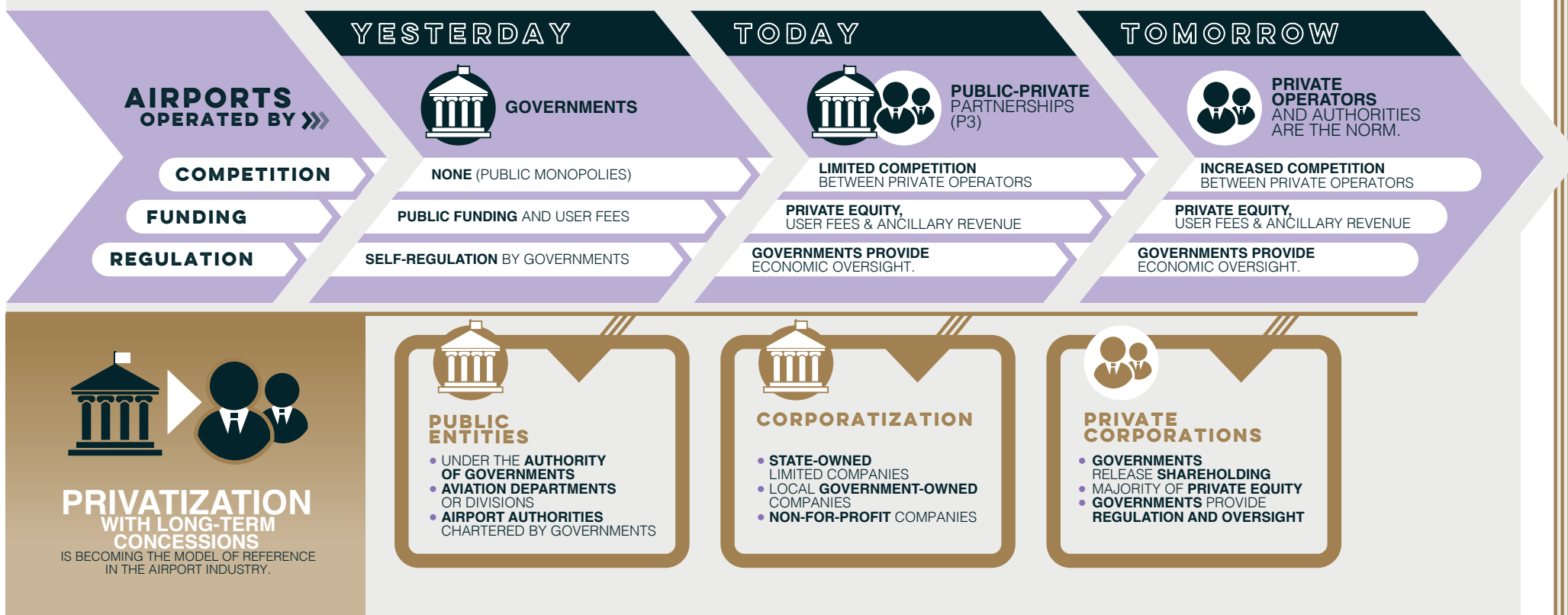
NEW HUB AND  
REGIONAL AIRPORTS  
AS WELL AS ROUTE  
NETWORKS WILL BE  
**NEEDED.**

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# SUSTAINABLE BUSINESS MODELS AND NEW SOURCES OF FUNDING



**CAPITAL EXPENDITURE**  
OF COMMERCIAL AIRPORTS SHALL BE  
**SUPPORTED BY AVIATION REVENUES AND DEBT**  
INSTRUMENTS. SOME SMALLER AIRPORTS  
WILL STILL NEED FINANCIAL ASSISTANCE.

A FUNDAMENTAL PRINCIPLE IS THAT  
“**AVIATION PAYS FOR ITSELF**”.

AIRPORTS SHALL **INVEST**  
IN INNOVATION.  
BUT INSTITUTIONAL R&D  
AND PUBLIC POLICIES  
ARE NEEDED TO ADDRESS THE  
CHALLENGES OF THE FUTURE.

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# SMART AIRPORTS

## AT THE ERA OF INFORMATION TECHNOLOGIES

### MATURE INFORMATION TECHNOLOGIES

#### GOING PAPERLESS THROUGHOUT THE PASSENGER JOURNEY

- **ELECTRONIC** BOARDING PASS.
- **SELF-SERVICE** CHECK-IN.
- **APPS ON MOBILE DEVICE** DELIVERING FLIGHT STATUS UPDATES.

#### CUSTOMIZING THE CUSTOMER EXPERIENCE AT THE AIRPORT

- **INFORMATION IS GEOREFERENCES** TO ENHANCE THE JOURNEY.
- **CUSTOMIZED OFFERS** VIA THE AIRPORT APPS.
- **ENHANCED WAYFINDING** FOR PASSENGERS WITH SPECIAL NEEDS AND INTERNATIONAL VISITORS.

#### AIRPORTS CONNECTED TO THE FIELD AND THE WORLD

- **AIRPORT COLLABORATIVE DECISION MAKING (A-CDM):** MINIMIZE THE IMPACT OF ADVERSE CONDITIONS AND PROMOTE INFORMATION SHARING BETWEEN THE STAKEHOLDERS.
- **SYSTEM WIDE INFORMATION MANAGEMENT (SWIM):** SHARE DATA WITHIN AN INFORMATION-CENTRIC SYSTEM FOR ATFM AND BEYOND.
- **INCREASED SAFETY AND RESILIENCE:** RADARS AND CAMERAS FOR DETECTING FOREIGN OBJECT DEBRIS (FOD) ON RUNWAYS.

### IMPROVING THE PASSENGER EXPERIENCE...

### EMERGING INTELLIGENT TECHNOLOGIES

#### FIRST AND LAST MILES

- **NEW MOBILITY** ENABLED BY 2040 BY CONNECTED AND AUTOMATED VEHICLES (CAVS) AND EVTOL AIRCRAFT.
- **THESE NEW MOBILITY SERVICES** CAN REDUCE TRIP DURATION AND CONGESTION.

#### BIOMETRIC IDENTITY

- **CUSTOMIZING** THE CUSTOMER EXPERIENCE AT THE AIRPORT.
- **FACIAL RECOGNITION** AND FINGERPRINTS.
- **REDUCED QUEUING** AND WAITING TIMES FROM CHECK-IN TO THE GATE.

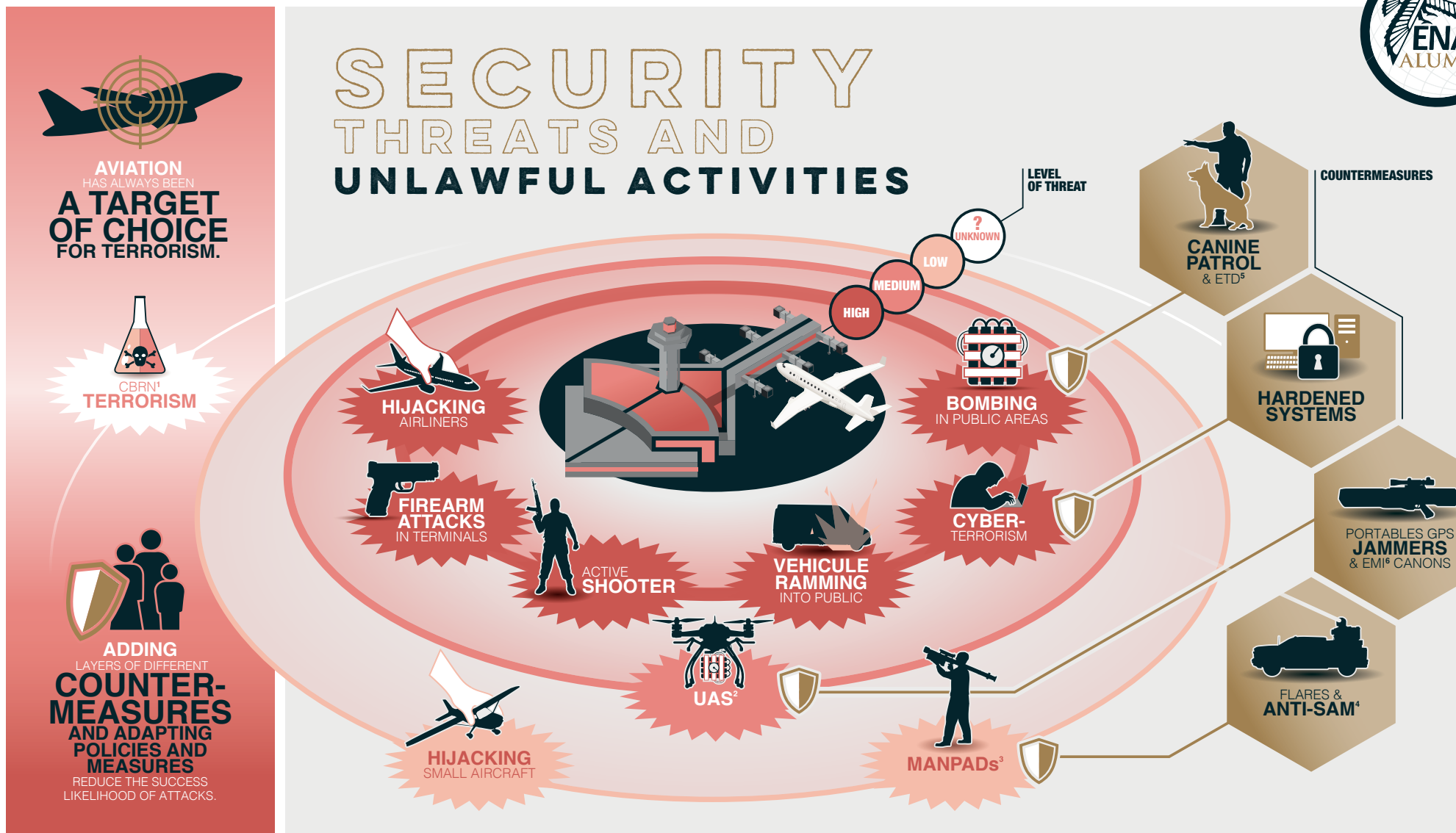
#### THE ARTIFICIAL INTELLIGENCE AND ARTIFICIAL NEURAL NETWORKS (ANN) REVOLUTION IS COMING.

- **ASSIST, SUPPLEMENT, AND EVEN REPLACE HUMAN ANALYSIS** AND DECISION-MAKING IN DOMAINS SUCH AS OPERATIONAL RESOURCE MANAGEMENT AND ASSET MANAGEMENT.
- **PROVIDE ANALYTICS AND DIRECT ASSISTANCE TO DECISION-MAKING** WITH "WHAT-IF" SCENARIOS - EVOLUTION FROM A REACTIVE MANAGEMENT TO A PROACTIVE ORGANIZATION.

### AND THE OPERATIONS

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**EDUCATION AND TRAINING OF THE BROADER AIRPORT COMMUNITY**  
ARE VITAL FOR RAISING AWARENESS.



**THREAT ASSESSMENT**  
SHALL BE REVISED PERIODICALLY  
WITH THE INTELLIGENCE COMMUNITY AND BASED  
ON THE GLOBAL CONTEXT.



**POLICIES AND COUNTERMEASURES**  
SHOULD BE MORE RISK-BASED  
AND AGILE TO INCREASE  
THEIR EFFICIENCY  
AND REDUCE THEIR IMPACT  
ON AIRPORT PROCESSES.

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**AIRFIELD ENGINEERING HAS REACHED A HIGH LEVEL OF MATURITY. ENHANCEMENTS CAN STILL BE INTRODUCED.**

## ENHANCING AVIATION SAFETY UNDER A GROWING AND MORE DIVERSE TRAFFIC



**YESTERDAY**



**SAFETY IS WRITTEN IN STONE**

**TODAY**



**THE RISE OF THE RISK-BASED APPROACH**

**TOMORROW**



**DATA & ALGORITHMS ENABLE A NEW LEVEL OF SAFETY**

**STANDARDS**

WERE **PRESCRIPTIVE**

FOLLOW A **RISK-BASED APPROACH**

WILL BE **RISK-BASED**

**SAFETY**

RELIES ON **LOCAL EXPERIENCE**

IS INCREASED BY **SMS\* AND DATA SHARING**

BENEFITS FROM **DATA MINING**

**POLICIES**

**REACTIVE**

**PROACTIVE**

WILL PROMOTE **PREDICTIVE SAFETY**



**THE NEW SAFETY NETS ARE SYSTEMS AND OPERATIONAL REQUIREMENTS**  
RATHER THAN SOLELY BRICK-AND-MORTAR IMPROVEMENTS.

## ENHANCING AVIATION SAFETY DURING AIRPORT CONSTRUCTION: A SUCCESS STORY

**BEFORE 2010**

**STANDARDS AND PRACTICES ARE NOT SUFFICIENT.** ACCIDENTS ARE OFTEN NEARLY AVOIDED. SAFETY RISK ASSESSMENTS ARE NOT SYSTEMATIC.

**2010-2015**

INDIVIDUAL AIRPORTS BECOME AWARE OF THESE WEAKNESSES THROUGH SMS AND **TEAM TOGETHER TO CREATE NEW PRACTICES.**

**2015-2020**

**THESE NEW PRACTICES ARE CODIFIED AND ADOPTED WORLDWIDE.** THEY ARE BEING IMPLEMENTED AT A GROWING NUMBER OF AIRPORTS.

**2020-2025**

**DISSEMINATION THROUGHOUT THE LESS DEVELOPED COUNTRIES.** LESSONS LEARNED AND EXPERIENCE SHARING BECOME WIDESPREAD WORLDWIDE.

**TOWARD 2040 AND BEYOND**

AIRPORTS PROVIDING **REAL-TIME INFORMATION TO AIRCRAFT AND AUTOMATION INCREASE AWARENESS AND SAFETY.**



**THE STEP FORWARD**  
WILL BE DATA MINING AND GROUND-BOARD DATA SHARING FOR  
**PREDICTIVE SAFETY.**



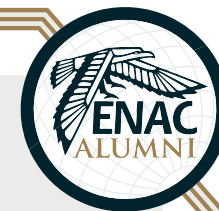
**THE AVERAGE GLOBAL EFFECTIVE IMPLEMENTATION OF ICAO'S SARP WITH REGARD TO AERODROMES IS OF 62.29%.**  
**WE SHALL REDUCE THE SAFETY GAP**  
WITH THE LESS DEVELOPED COUNTRIES.



**A STRONG COMMITMENT**  
OF GOVERNMENTS AND INTERNATIONAL COOPERATION IS  
**URGENTLY NEEDED TO INCREASE SAFETY**  
BEFORE AIR TRAVEL SKYROCKETS.

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**AERONAUTICAL INNOVATION**  
IS RESHAPING AIRCRAFT AND  
**ENABLING**  
**NEW USE CASES.**  
**MORE DIVERSITY**  
IN AIRCRAFT GEOMETRY,  
FEATURES, AND PERFORMANCE  
IS COMING.



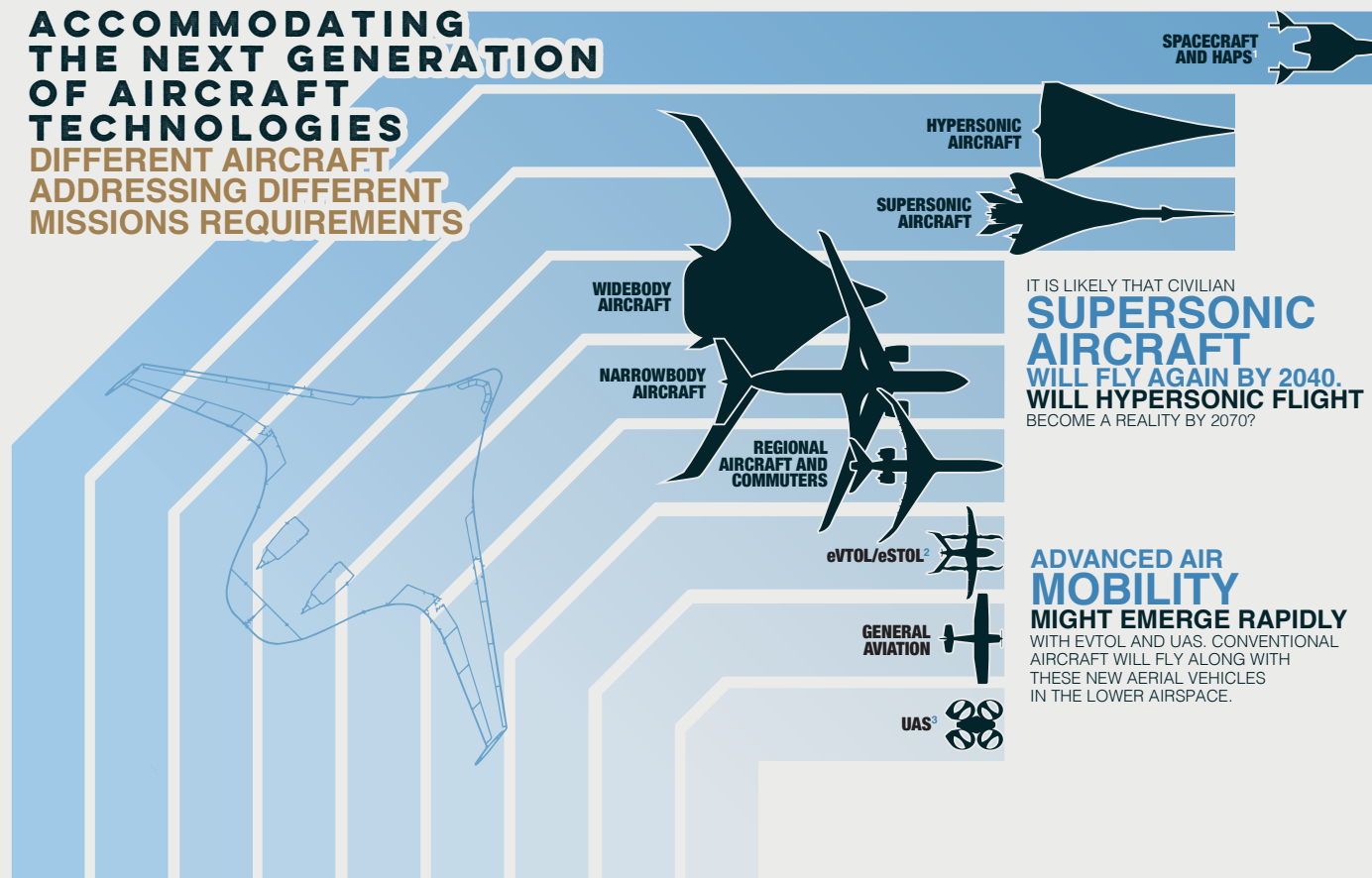
WE ARE ONLY AT THE  
**BEGINNING OF THE**  
**JUMBO**  
**JET ERA.**



THE NEXT PHASE  
OF ATM MODERNIZATION  
WILL LEVERAGE BREAKTHROUGHS IN  
**AUTOMATION.**

# AIRPORT COMPATIBILITY

**ACCOMMODATING  
THE NEXT GENERATION  
OF AIRCRAFT  
TECHNOLOGIES**  
**DIFFERENT AIRCRAFT  
ADDRESSING DIFFERENT  
MISSIONS REQUIREMENTS**



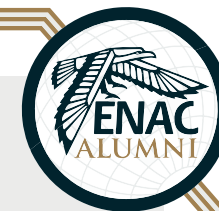
**ELECTRIC AND  
HYDROGEN AIRCRAFT**  
**WILL REQUIRE A GROUND  
INFRASTRUCTURE**  
THAT HAS YET TO FIND ITS BUSINESS MODEL.  
IT SHALL BE IMPLEMENTED ON TIME TO SUPPORT  
THE ENERGY TRANSITION OF AIR TRANSPORTATION.



**COULD A REVOLUTION  
IN THE ECONOMIC MODEL**  
OF AIR CARRIERS BRING FLEXIBILITY, SAFETY,  
LOWER AIR FARES, AND ENABLE A NEW PERIOD  
OF PROSPERITY IN AVIATION? MANUFACTURERS ALREADY  
LEASE AIRCRAFT. COULD THEY BE THE FLIGHT OPERATORS OF THE FUTURE  
WHILE OTHERS WILL MARKET ROUTES & SELL TICKETS?

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AIRPORT OPERATORS HAVE BECOME  
**MOBILITY AND HOSPITALITY PROVIDERS.**

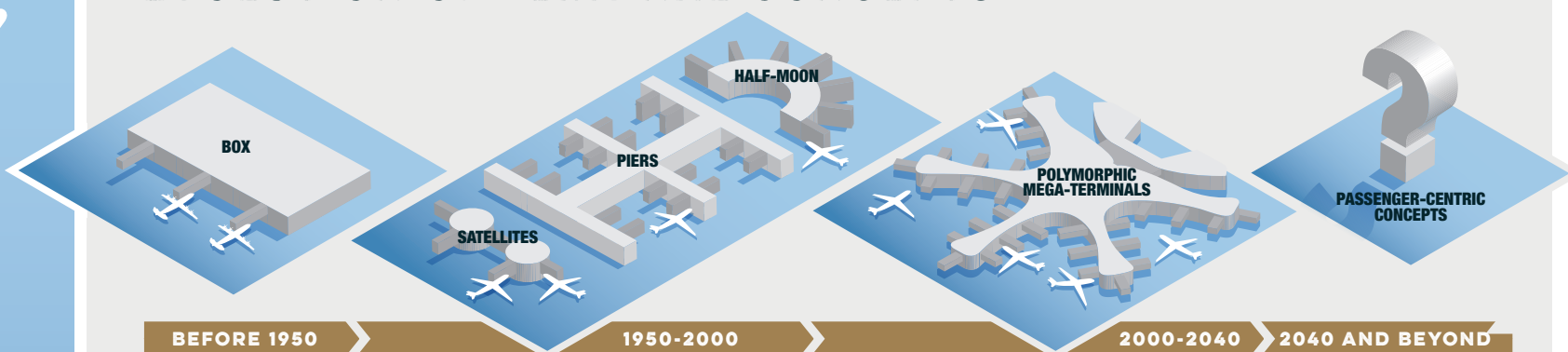


TERMINAL CONCEPTS SHOULD FOCUS ON PROVIDING A  
**SEAMLESS AND EFFICIENT PASSENGER JOURNEY.**

# PASSENGER TERMINALS

## AND CUSTOMER EXPERIENCE

### EVOLUTION OF TERMINAL CONCEPTS

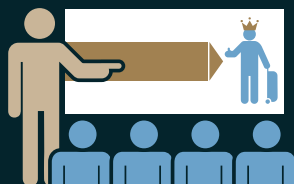


### DIVERSE NEEDS AND EXPECTATIONS

- SINGULAR EXPERIENCE
- QUALITY & COMFORT FIRST
- HUMAN IN THE LOOP
- CUSTOMIZED SERVICES



- SEAMLESS JOURNEY
- COST-EFFICIENCY
- MORE AUTOMATION
- INCLUSIVE EXPERIENCE FOR ALL



**ENHANCING THE FIRST AND LAST MILES** WILL BE A MAJOR OBJECTIVES OF BOTH AIRPORTS AND AIR CARRIERS.



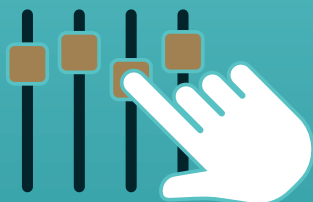
BAGS ARE BECOMING LIGHTER AND PASSENGERS WILL BE OFFERED TO DROP THEM OFF OUTSIDE OF THE AIRPORT AND EVEN GET THEM **DELIVERED AT THEIR FINAL DESTINATION.**

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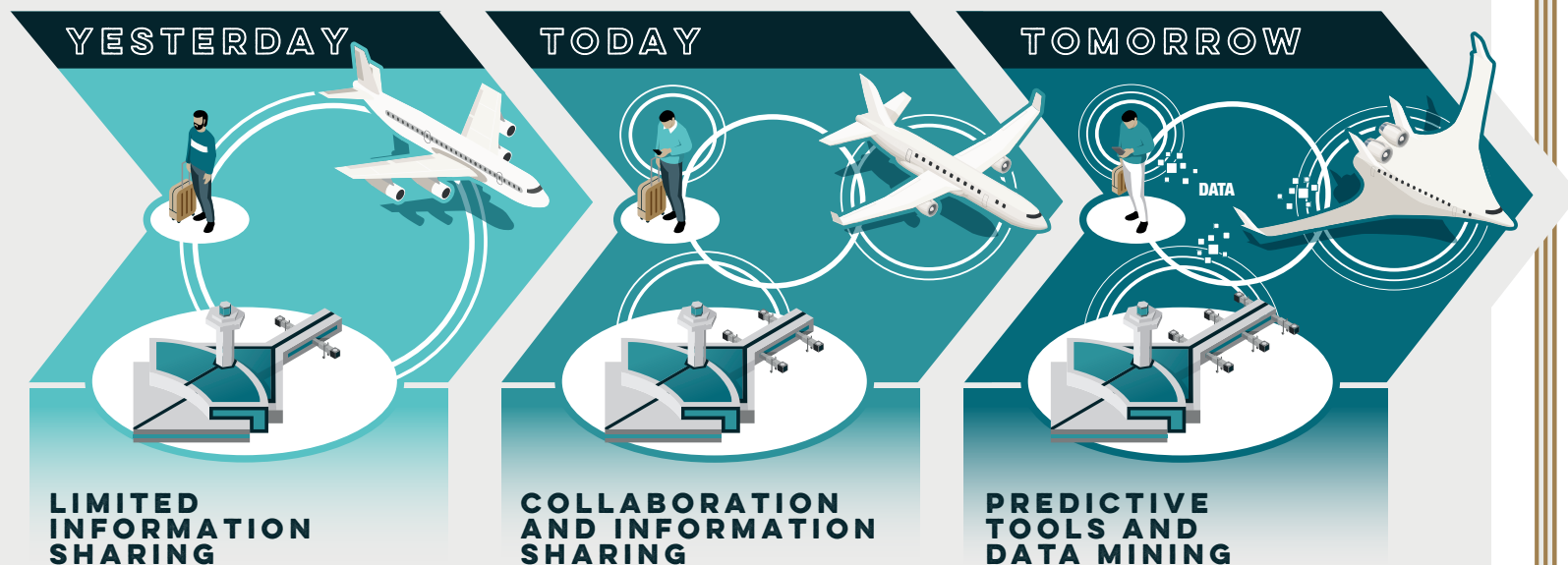


**COLLABORATION**  
IS BREAKING DOWN BARRIERS  
BETWEEN THE STAKEHOLDERS.  
**IT ENHANCES  
OPERATIONS  
SIGNIFICANTLY.**



AIRPORTS  
WILL BENEFIT FROM  
**INTEGRATED  
AIRPORT  
OPERATIONS  
MANAGEMENT**  
THAT IS BECOMING  
AN INDUSTRY STANDARD.

# OPERATIONAL PERFORMANCE AND RESILIENCE



OPERATIONS ARE TRANSITIONING  
FROM MONITORING AND REACTIVE MANAGEMENT TO  
**PREDICTION AND PROACTIVE DECISION-MAKING.**



AIRPORTS AND NETWORKS HAVE  
BECOME MORE SENSITIVE  
**TO CLIMATE-INDUCED  
DISRUPTIONS.**  
THEY SHALL DEVELOP  
**MORE RESILIENCE**  
TOWARD ADVERSE CONDITIONS.



RELYING  
INCREASINGLY  
**ON SYSTEMS**  
CREATES NEW  
VULNERABILITIES.

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**AIRPORTS  
ARE PART OF  
THE COMMUNITIES  
THEY SERVE.**



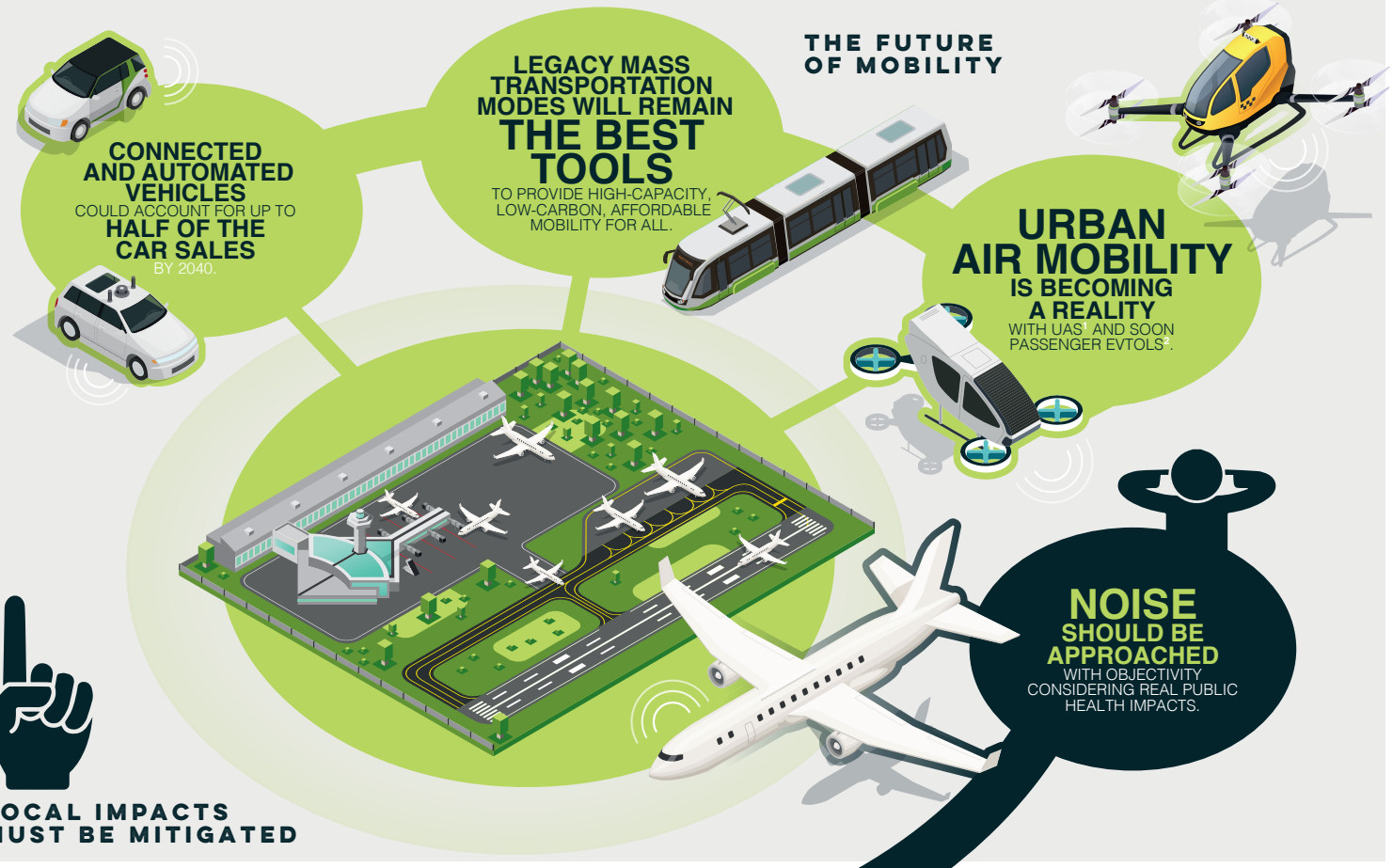
**AIRPORTS  
ATTRACT AND CREATE  
OPPORTUNITIES.  
THEY SHOULD  
PARTNER  
WITH LOCAL COMMUNITIES  
TO ENABLE SUCCESSFUL INITIATIVES.**

**AIRPORT  
RECRUITMENT PROGRAMS  
PROMOTES AND DEVELOP  
LOCAL  
EMPLOYMENT.**



**AIRPORT ACCESS  
SHALL CONSIDER  
LOCAL COMMUNITIES  
AND THE  
WORKFORCE.  
COOPERATION WITH TRANSIT AGENCIES  
AND STAKEHOLDERS  
IS ESSENTIAL.**

# COMMUNITIES AND MOBILITY



**AIRPORT PROJECTS  
SHOULD BALANCE  
THEIR NEGATIVE  
EXTERNALITIES AND  
SOCIAL PROFIT.**



**THE LONG-TERM  
DEVELOPMENT OF AIRPORTS  
CANNOT SUCCEED WITHOUT  
SOCIAL JUSTICE.**

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ENVIRONMENTAL GOALS ARE  
SOMETIMES COMPETING  
WITH EACH OTHER.  
HOW CAN WE  
**BALANCE THEM?**

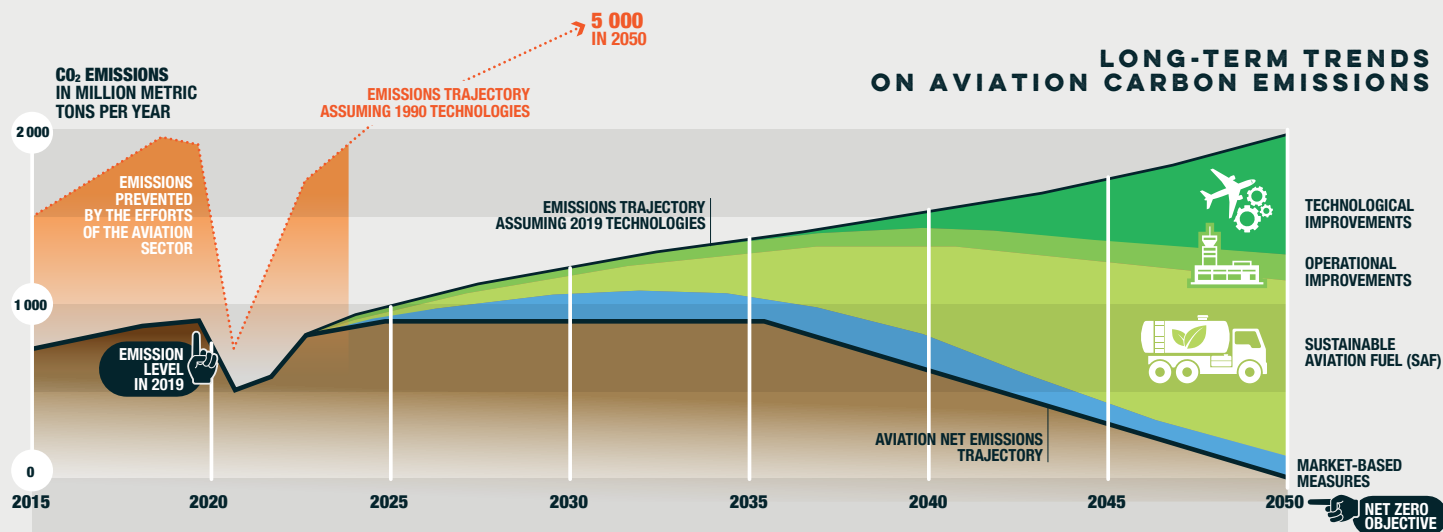


**CARBON OFFSET  
SHOULD NOT BE  
UNDERESTIMATED**  
AS A FIRST-STEP INSTRUMENT FOR LOWERING  
NET EMISSIONS.

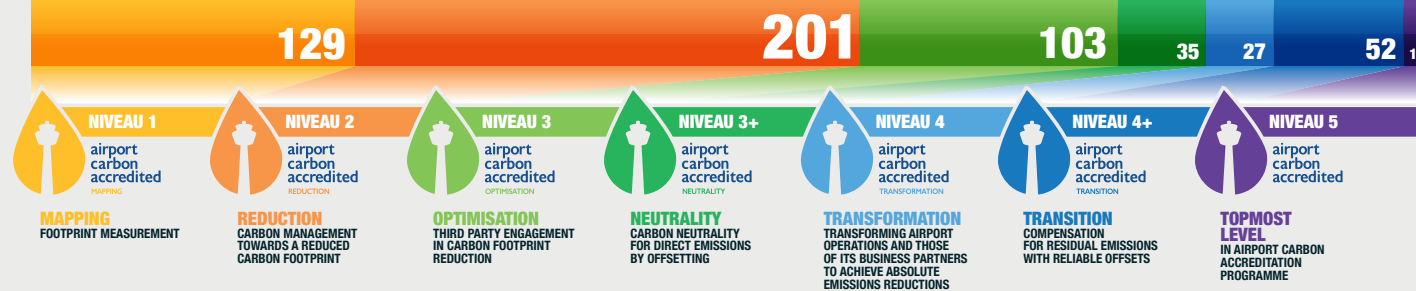


**NEGATIVE  
EXTERNALITIES  
ARE INCREASINGLY TAKEN  
INTO CONSIDERATION  
IN A HOLISTIC  
APPROACH OF  
SUSTAINABILITY.**

## SUSTAINABLE AND NET-ZERO AIRPORTS



### CARBON ACCREDITED AIRPORTS AROUND THE WORLD



**AVIATION  
PROVIDES  
TO HUMANITY  
AN OUTSTANDING  
VALUE ADDED**  
FAR BEYOND ITS SOLE  
MOBILITY FUNCTION.



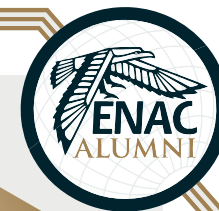
AVIATION HAS MADE  
**TREMENDOUS  
EFFORTS  
FOR LOWERING  
ITS ENVIRONMENTAL  
FOOTPRINT.**



**GREEN TAXES**  
ON AVIATION SHALL  
**FUND SUSTAINABLE AVIATION**  
INSTEAD OF UNFAIRLY SUBSIDIZING  
OTHER MODES.

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FRESHLY GRADUATED PROFESSIONALS  
WILL HAVE TO  
**RESTART LEARNING  
NEW SKILLS**  
RIGHT AFTER  
LEAVING SCHOOL.



CHANGE  
MANAGEMENT  
WILL BE PART OF REGULAR OPERATIONS.  
THERE WILL BE  
**A GROWING NEED FOR  
CONTINUING  
EDUCATION  
PROGRAMS.**

# HUMAN RESSOURCES AND EDUCATION



**TECHNOLOGICAL  
BREAKTHROUGHS**



**EVOLUTION  
OF JOB  
REQUIREMENTS**

**MOST JOB  
DESCRIPTIONS  
OF 2040 AND 2070  
WILL INCLUDE  
REQUIREMENTS  
AND MISSIONS THAT  
DO NOT EXIST  
TODAY.**



**ORGANIZATIONAL  
CHANGES**



**EVOLUTION  
OF SOCIAL  
EXPECTATIONS**



**DEMOGRAPHIC  
CHANGES**



**BIASES AND  
DISCRIMINATION  
ARE PREVENTING  
TALENTS TO EMERGE.**  
GENDER-BASED DISCRIMINATION ALONE  
**COSTS THE EQUIVALENT  
OF 16% OF GLOBAL INCOME.**



**FEW HIGHER EDUCATION PROGRAMS**  
PROVIDE SPECIFIC COURSES TO EDUCATE THE AIRPORT  
**LEADERS  
OF TOMORROW.**



AIRPORTS AND PUBLIC AGENCIES  
**WILL FACE GROWING  
DIFFICULTIES IN  
RECRUITING AND  
RETAINING THE HIGHLY  
SPECIALIZED  
EXPERTS**  
NEEDED TO ADDRESS FUTURE NEEDS.

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