



**General Aviation and European Air
Transport System – Third Call FP7**

Warsaw 7-8, July 2009



**Introduction to the
EPATS
Project Results**

Krzysztof PIWEK,
EPATS STUDY Project Coordinator
Institute of Aviation, Poland



CHALLENGES:

European Research Area for Transport

- **„Improving the energy efficiency of all modes of transport”**
according „European Energy Strategy for Transport”
- **to give travelers a free choice of transport mode - according to their need, and limited by their time value,**

according EPATS

**Is it possible replacing car trips
on a distance longer than 300 km
by personal aircraft ?**





6th Framework Programme
1.4 Aeronautics and Space

**AERONAUTICS SPECIFIC SUPPORT ACTION
Proposal**

Proposal Title:

**EUROPEAN PERSONAL AIR
TRANSPORTATION SYSTEM
STUDY
- EPATS -**

**EUROPEAN PERSONAL AIR
TRANSPORTATION SYSTEM**

EPATS - STUDY

Institute of Aviation
Eurocontrol Experimental Center
M3Systems
National Aerospace Laboratory
Polskie Zakłady Lotnicze sp. z o.o. w Mielcu
Rzeszów University of Technology
WSK PZL Rzeszów S.A.
Budapest University of Technology & Economy
Windrose Air JetCarter GmbH

Warsaw, March 2006

10 Participants

5 European countries

Poland,
France,
Netherland,
Germany,
Hungary

1 International

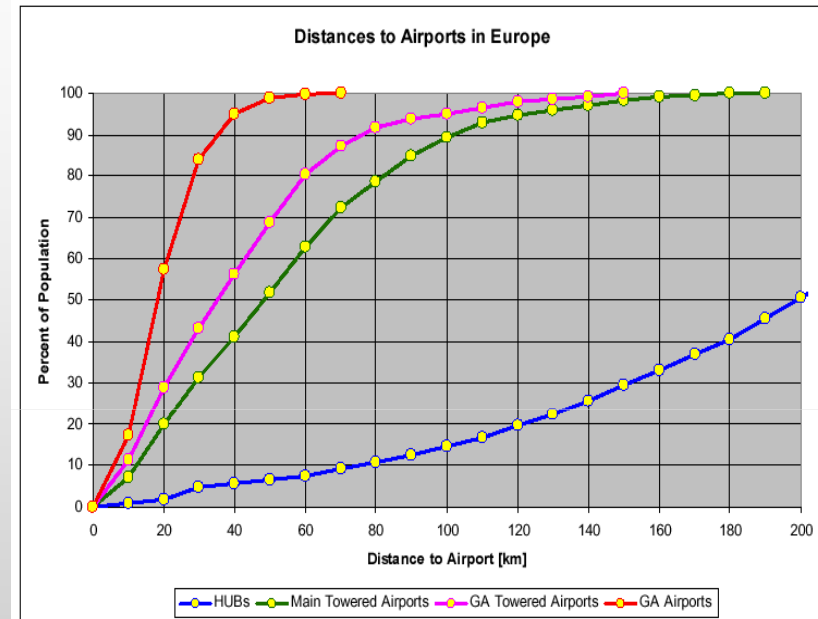
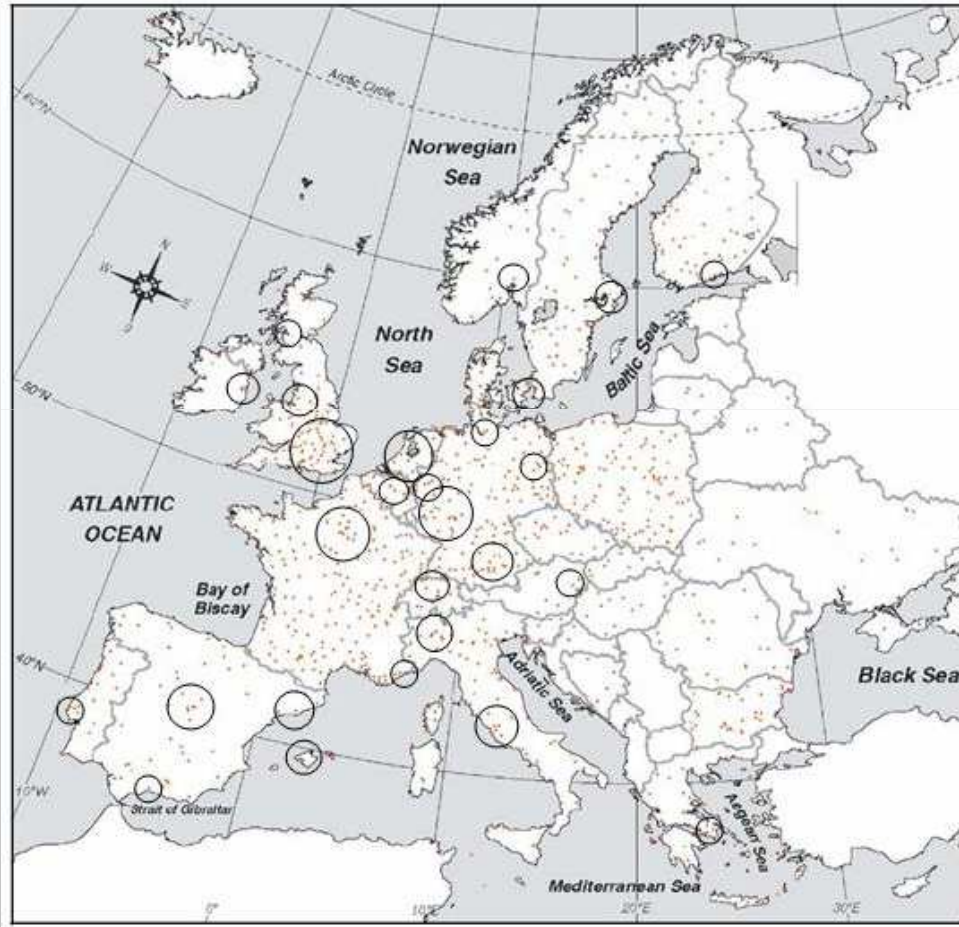
EUROCONTROL

<i>Partic. No.</i>	<i>Participant name</i>	<i>Partic. short name</i>	<i>Country</i>
1	Institute of Aviation	IoA	Poland
2	Eurocontrol Experimental Center	EEC	Europe
3	M3systems	M3S	France
4	National Aerospace Laboratory	NLR	Netherlands
5	Polskie Zakłady Lotnicze sp. z o.o. w Mielcu	PZL M	Poland
6	Rzeszow University of Technology	RzUoT	Poland
7	WSK PZL Rzeszów S.A.	PZL Rz	Poland
8	Budapest University of Technology & Economics	BUTE	Hungary
9	Windrose Air Jet Charter GmbH	Windrose	Germany
10	AD Cuenta	AD Cuenta	Netherlands

Objectives:

- **Demand** in 2020
- **Impact** (on ATM, airport infrastructure, environment, safety, security, innovative technologies for new personal aircraft)
- **Requirements** for EPATS aircraft
- **Roadmap & Recommended R&TD**

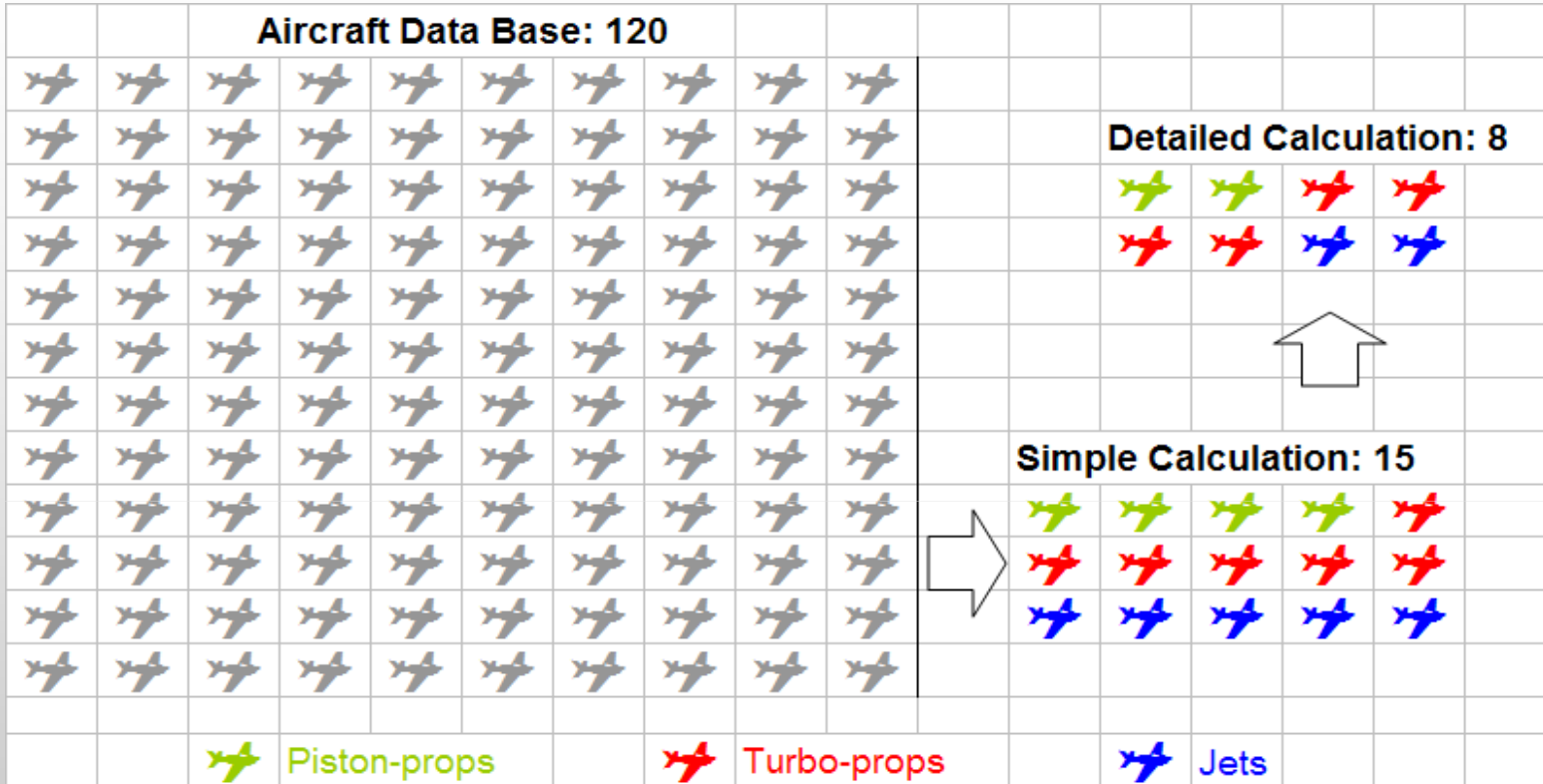
<p>WP or Task N°: EPATS STUDY Project</p>	<p>Reporting WP or Task Leader Consortium EPATS</p>
<p>Objective</p>	<ul style="list-style-type: none"> •State of art European Personal Aviation, •Market potential of PA, assumption to Impact, Missions, Roadmap •Start to create EPATS Community
<p>Major Results</p>	<ul style="list-style-type: none"> •Important workshops: <ul style="list-style-type: none"> • EPATS Expert in EUROCONTROL Bretigny; •VLJ in EUROCONTROL Brussels •CESAR/EPATS meeting •SESAR/EPATS meeting •EPATS Data Base - defined •EPATS EPATS Demand 2020 – defined •EPATS Impacts – defined •EPATS Missions Requirements for EPATS aircraft - defined •EPATS Roadmap – Vison - done
<p>Delivered items</p>	<p>Deliverable Reports – 21 done Technical Reports – 13 done EPATS SSA – total 45 man months – 280 KEuro</p>
<p>Next actions?</p>	<p>next proposal for FP7 – according workprogramme 2008 - done</p>



1270 airports and 1300 landing fields

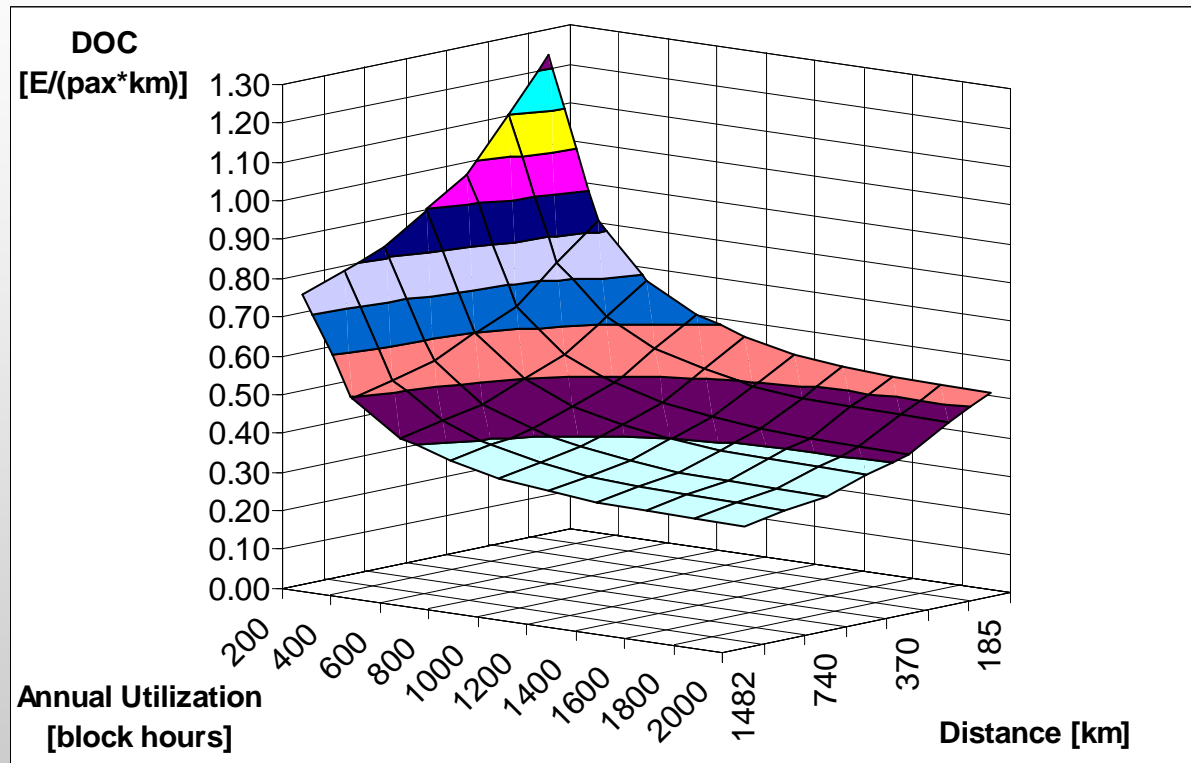
= 2570 airfields

43 hubs = 85% traffic



Affordable Personal Air Transport

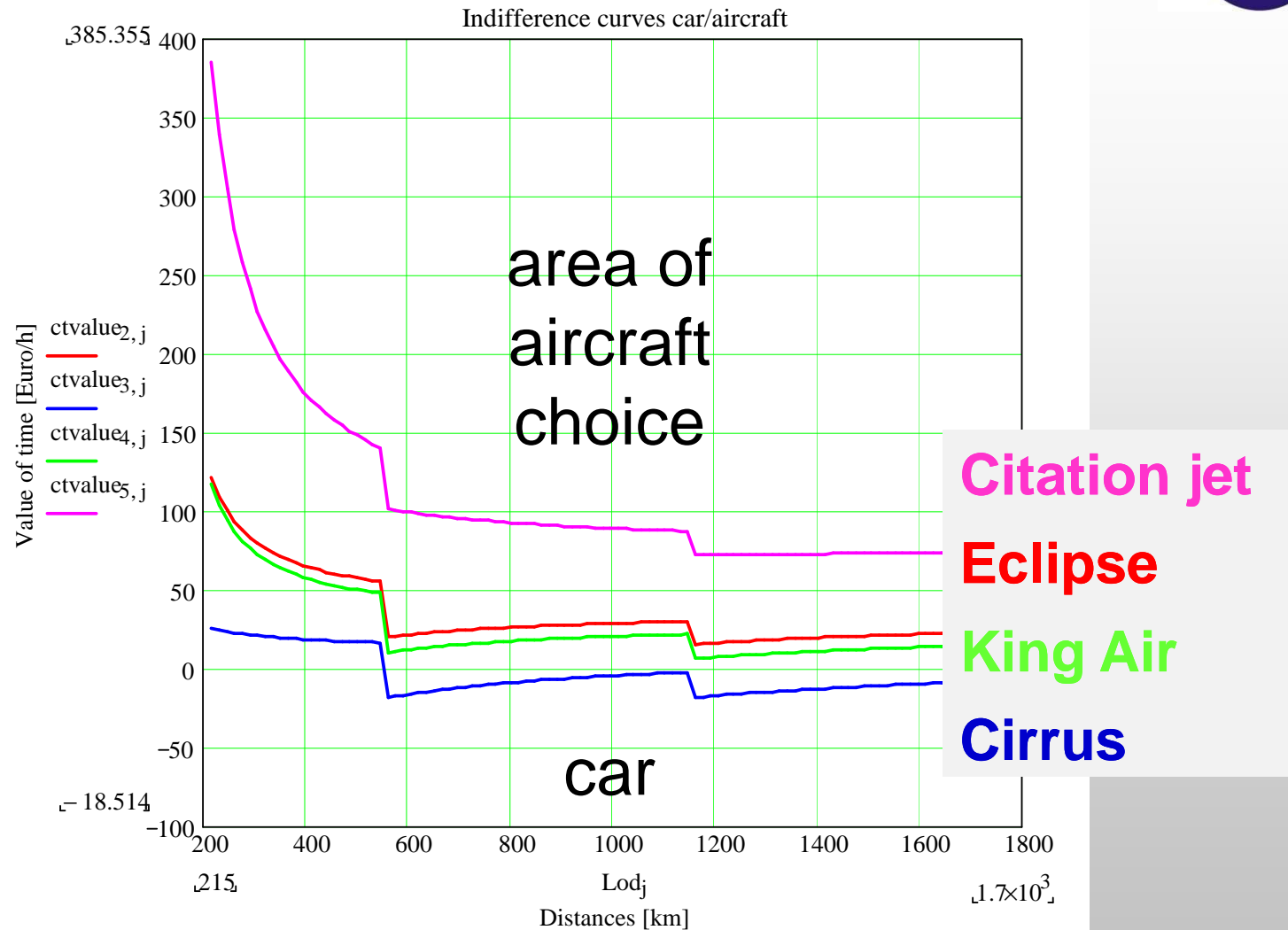
DOC



**DOC
Very
Sensitive
to
Utilization
Intensity**

**Distance
Impact**

- Business model – „executive”** (small annual utilization, small load factor)
- Business model – „commercial”**
- **Air taxi** (annual utilization > 500h, load factor medium)
 - **EPATS** (annual utilization > 1000h, load factor high)



Generalized Cost (for transport mode i) = f° (distance, value of time, accommodation)
 With Value of Time = f° (income, trip reason)

MODAL SPLIT VIA DISTANCE AND TIME VALUE

Inverse Cumulative Frequency %	Time value [Euro/h]	One way travel Great Circle Distance [km]							
		200	300	500	700	900	1100	1300	1500
80	3	Car	Car	Car	Car	Car	Car	Car	Car
60	5	Car	Car	ACP-1	ACP-1	ACP-1	ACP-1	ACJ-1	ACJ-1
40	8	Car	ACP-1	ACP-1	ACP-1	ACP-1	ACP-1	ACJ-1	ACJ-1
20	13	Car	ACP-1	ACP-1	ACP-1	ACP-1	ACJ-1	ACJ-1	ACJ-1
10	18	Car	ACP-1	ACP-1	ACP-1	ACP-1	ACJ-1	ACJ-1	ACJ-1
5	22	Car	ACP-1	ACP-1	ACP-1	ACP-1	ACJ-1	ACJ-1	ACJ-1
1	33	Car	ACP-1	ACP-1	ACP-1	ACP-1	ACJ-1	ACJ-1	ACJ-1
0,1	64	ACP-1	ACP-1	ACP-1	ACP-1	ACP-1	ACJ-1	ACJ-1	ACJ-1
0,01	80	ACP-1	ACP-1	ACP-1	ACP-1	ACJ-1	ACJ-1	ACJ-1	ACJ-1

Car	Car, Average travel speed = 80 km/h, Operating Costs = 0,5 E/km
ACP-1	4 seat Piston Aircraft, Vcr = 320 km/h, Operating Costs = 350 E/h
ACJ-1	5 seats Jet Aircraft, Vcr = 700 km/h, Operating Costs = 1050 E/h

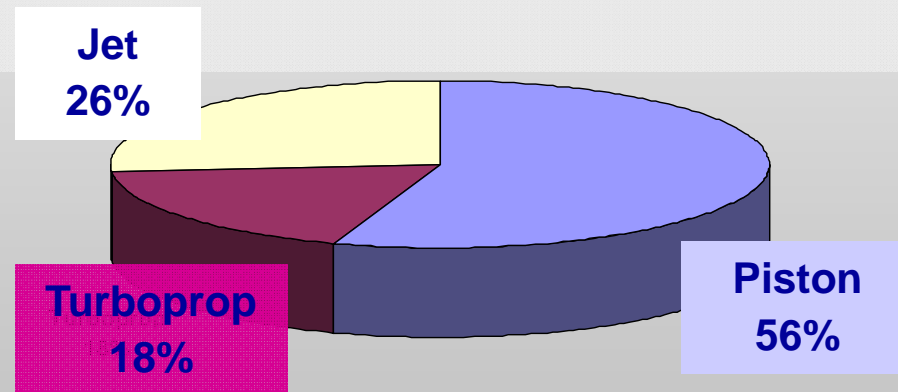
Generalized Cost (for transport mode i) = f° (distance, value of time, accommodation)
With Value of Time = f° (income, trip reason)

Transferred traffic to personal air transport in 2020:

3% of the total European traffic

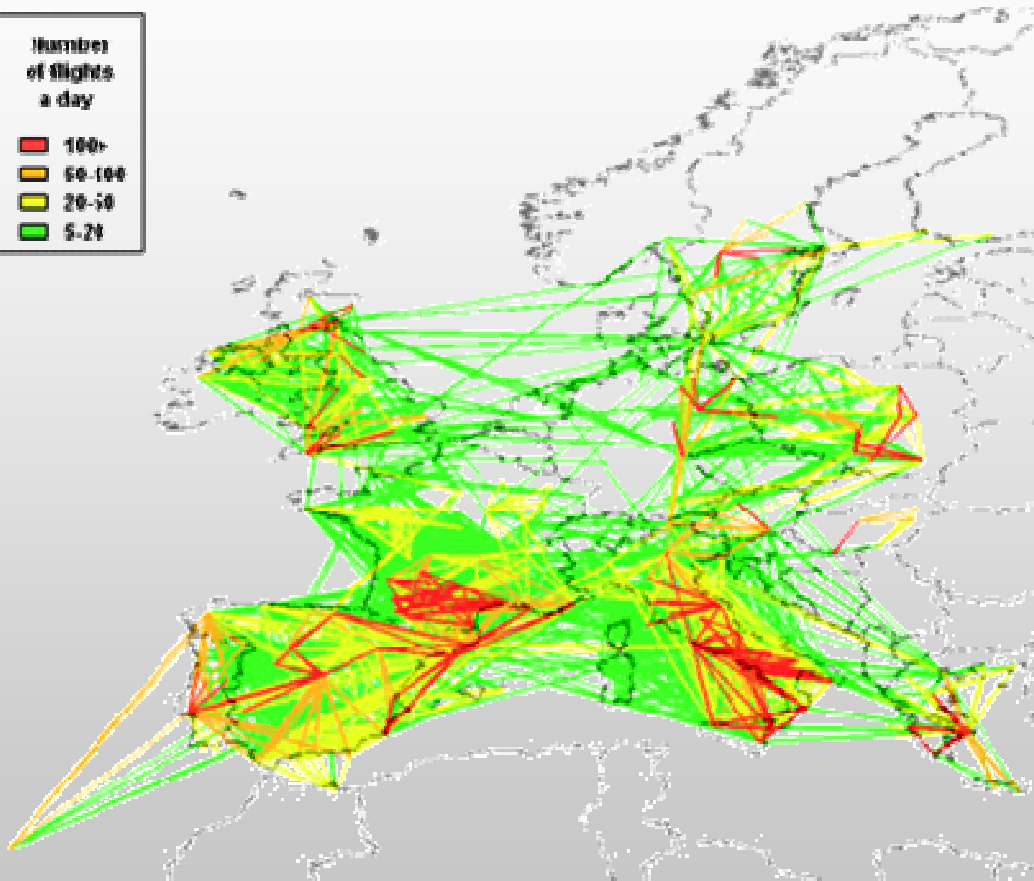
89 000 personal aircraft

43 000 000 flights per year



25 500 personal aircraft

if their operating cost increases by 30% (fuel cost, taxes, SESAR requirements, etc.)



EPATS seems to be avoiding the current ECAC Core Area

- TOP 10 connections between countries

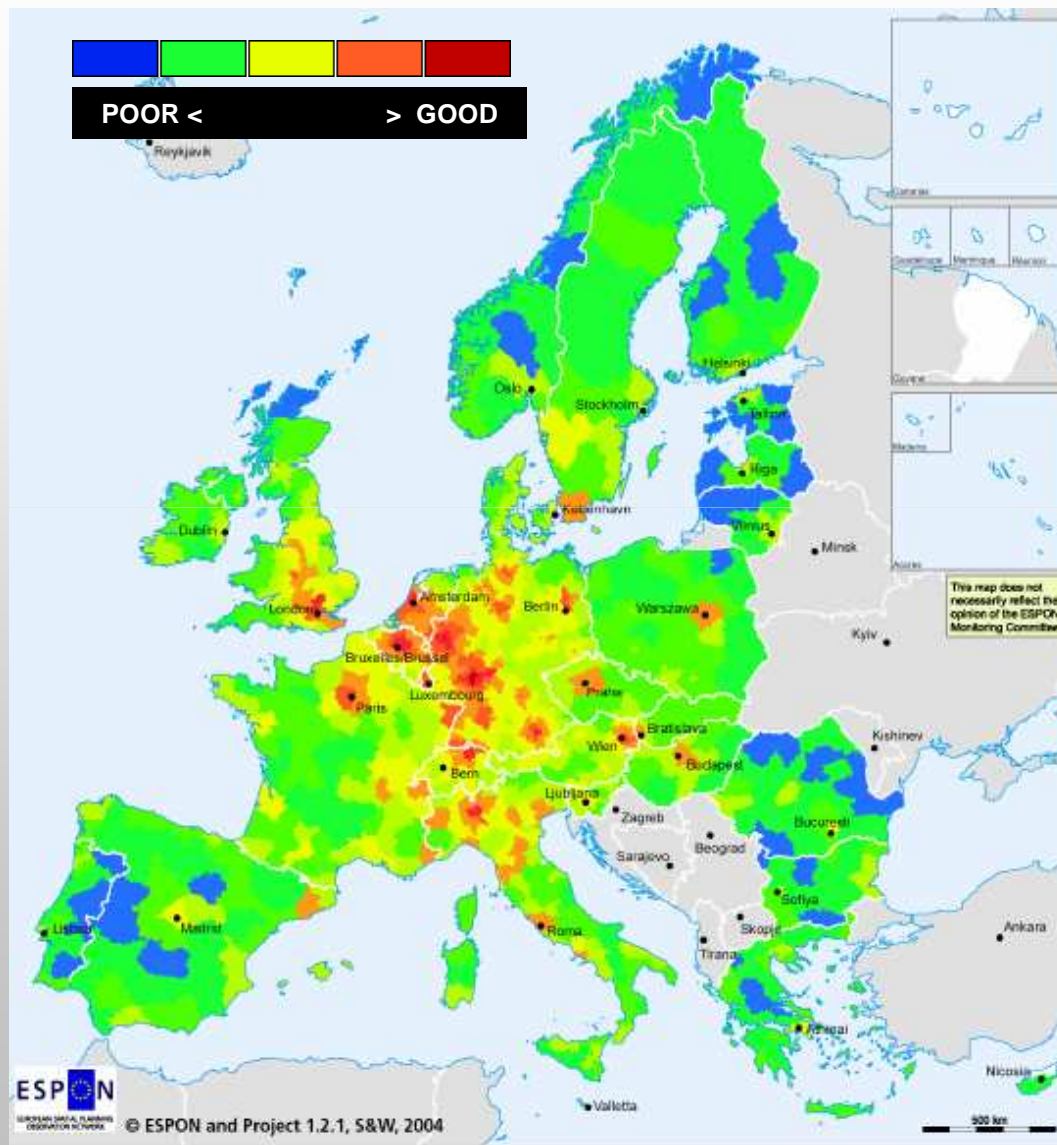
1. France-Spain
2. Portugal-Spain
3. Italy-France
4. United-Kingdom-Ireland
5. Poland-Germany
6. United-Kingdom-France
7. Italy-Spain
8. Italy-Austria
9. France-Germany
10. Italy-Greece

May be creating new dense/congested area and airports (mainly south of Europe but also England)

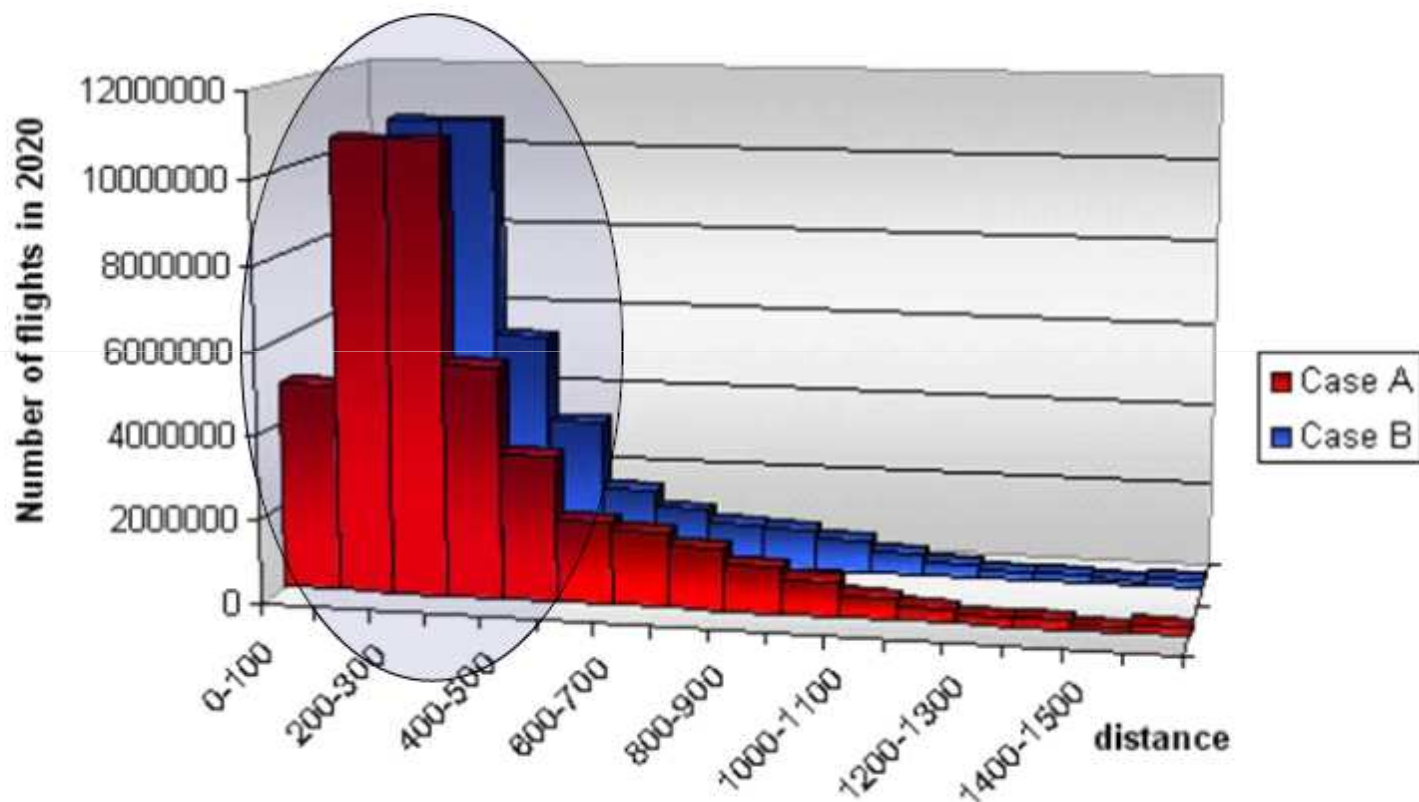
**Multimodal
potential
accessibility**
of EU Regions
measures transport
infrastructure
quality of modes
(car,rail,air)

NATS 2 - 268
(0,8 – 3 Mio inhabitants)

ESPON 2004

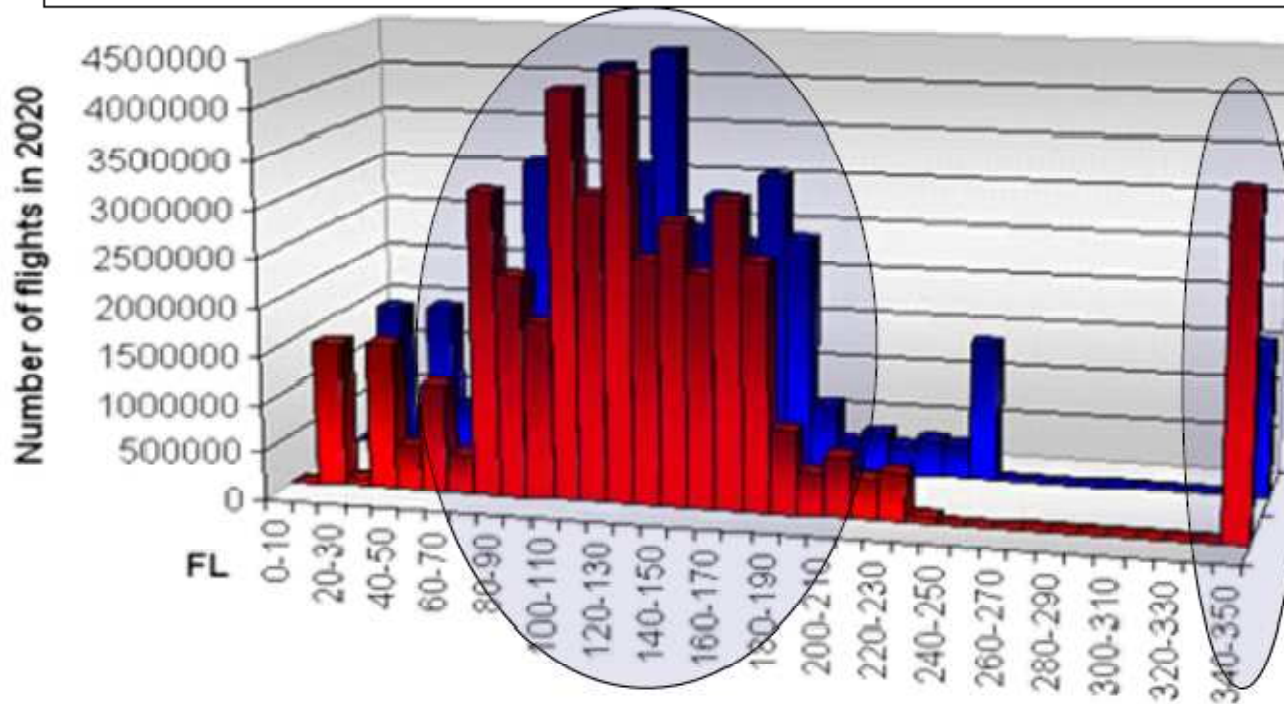


EPATS traffic distance distribution



Most of EPATS seems to be flying not longer than 500 Kms

EPATS cruising Flight Level distribution (standard distribution, not integrating ATM constraints)



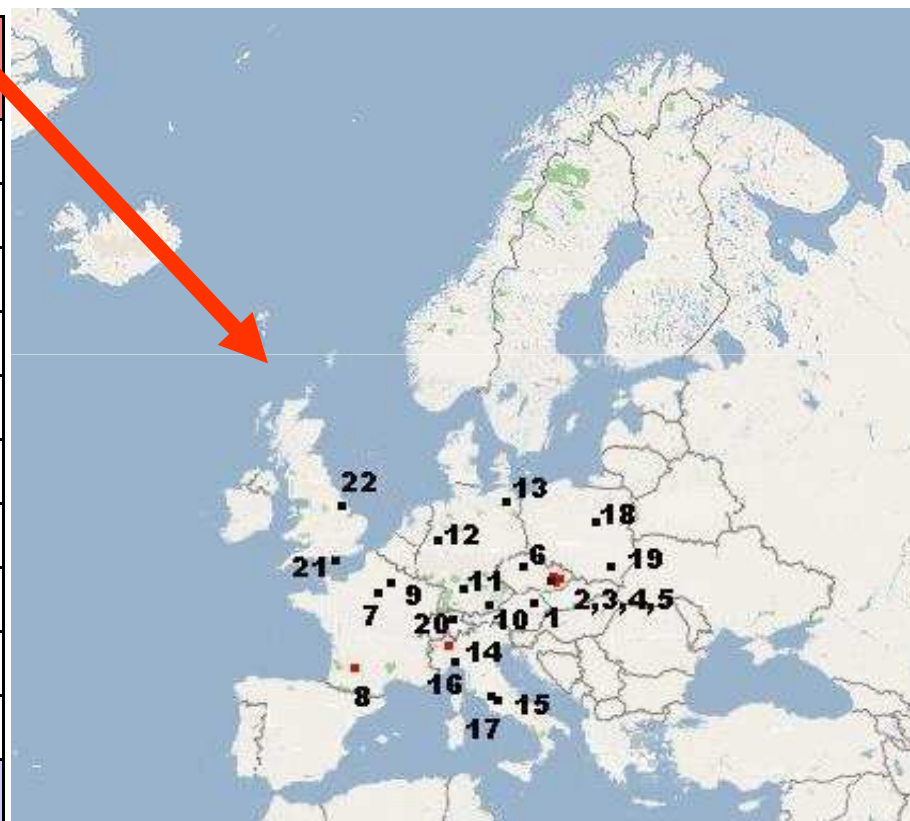
Most of EPATS flying below FL190

Case A
Case B

- Better EPATS statistics and forecasts needed
- EPATS will come quietly, so prepare!
 - **ATM safety research**
 - **Environmental friendly procedures**
 - **Emissions**
 - **Remote airfields / control / autoland / de-ice**
- Better SESAR for EPATS
- Single pilot Resource Management / Safety

Number of GA manufacturers in Europe on EASA website

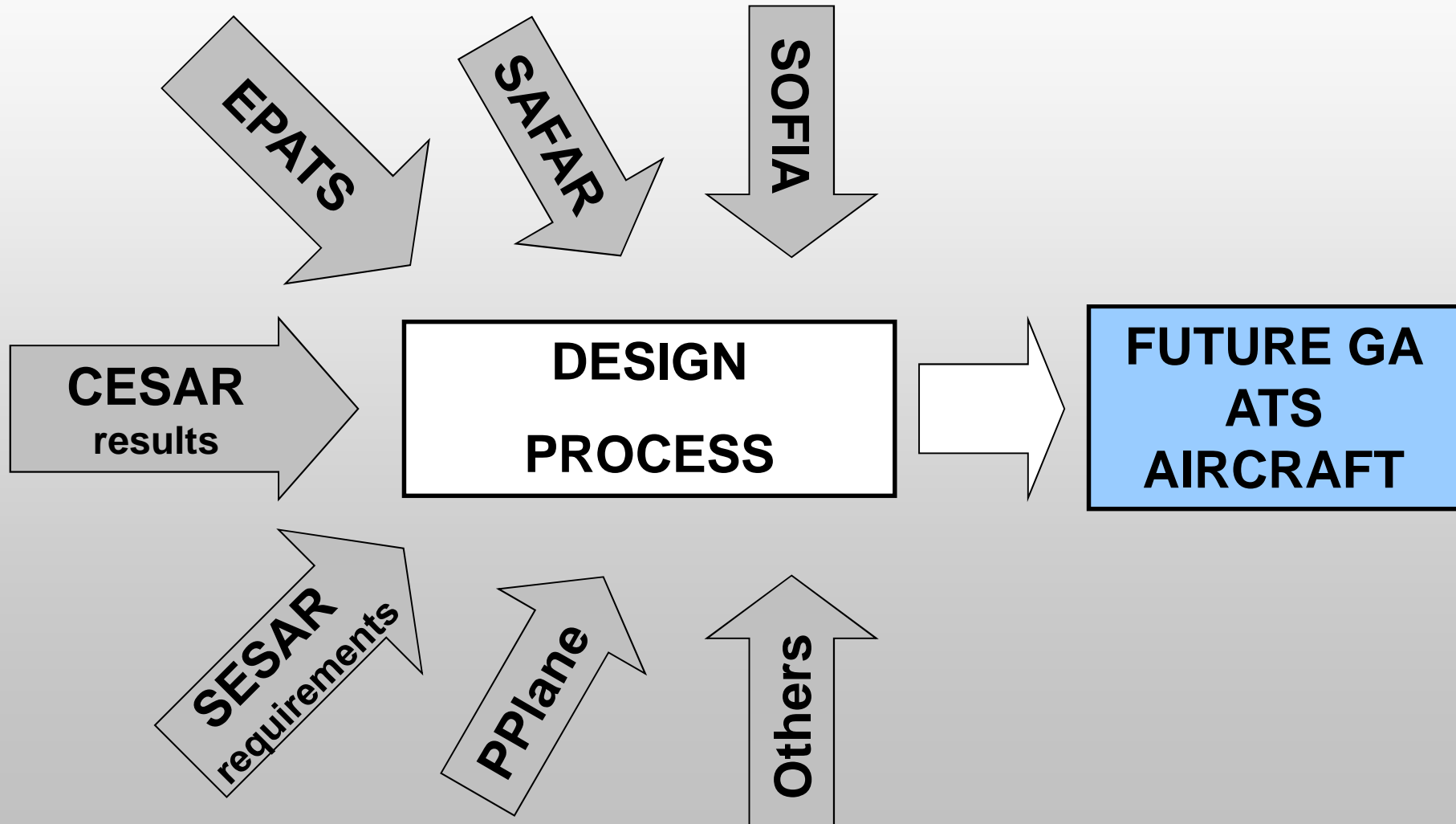
Country	No. of DOA (small aeropl.)	No. of POA A2 – small aeropl.
Czech Republic	5	5
Italy	4	4
Germany	3	3
France	2	3
United Kingdom	3	2 1
Poland	2	2 1
Austria	1	1
Switzerland	1	1
Spain	1	1
Sweden	1	0
Total	23	22 20



Number of European aviation firms with POA on EASA website total: 703

Maximum 5300 airplanes / year

FUTURE AIRCRAFT DESIGN: 2020



- **R&TD of GA creates real additional value for EU**
- **European GA community is emerging**
- **It is essential to support R&TD in GA area**

**by establishing
„small brother of JTI Clean Sky”
with main goal:
Technology Evaluator
of Small Air Transport Aircraft**



Polish General Aviation