



VLJ Workshop
Brussels, May 4, 2007

Introduction to the EPATS Project

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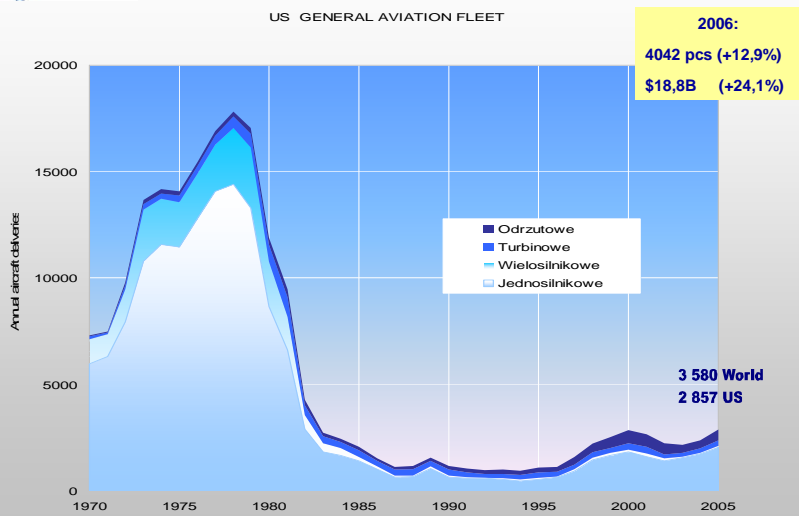


**Create scientific basis for aviation technology
tailored to market economy**



General Aviation Story

US GENERAL AVIATION FLEET



- GARA (General Aviation Revitalization Act – 1994)

„no civil action for damages for death or injury to persons or damage to property arising out of an accident involving a general aviation aircraft... If the accident occurred – (1) After the applicable limitation period beginning on – (A) the date delivery of the aircraft to its first purchase or lessee.. Limitation period means 18 years”

- AGATE (Advanced General Aviation Transport Experiments)

(1995 – 2000)

- GAP (General Aviation Propulsion)

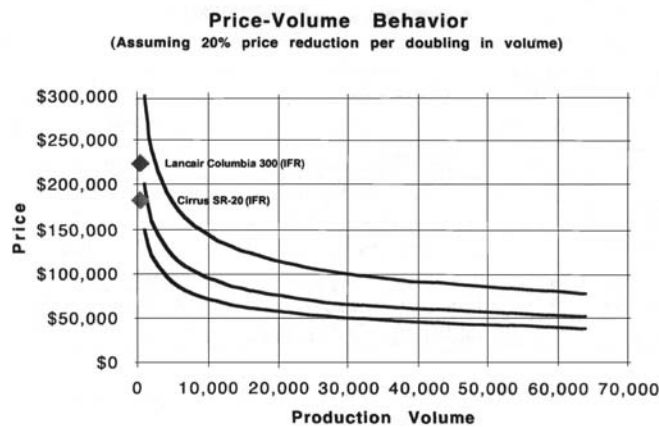
(1995 – 2000)

- SATS (Small Aircraft Transport System)

(od 2001)

The Effect of Volume on Price

ASIT Office of Aeronautics and Space Transportation Technology



TRB, National General Aviation Roadmap Review: 1/11/99


The New Industry
 (as of September 2003)



Cessna Mustang



Lancair



Cirrus



Avocet



Eclipse

**Honda,
Toyota,
And others...**



Adam Aircraft

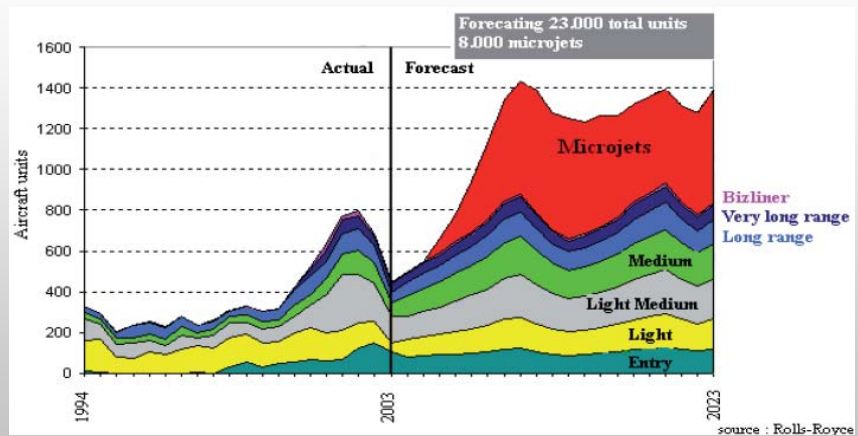


Saffire



Diamond

OK_CASI_11-14-03.ppt 26



Increasing number of microjets in the near future

EUROCONTROL Activity Report 2005 page 94



EPATS - STUDY Specific Support Action

6th Framework Programme
L4 Aeronautics and Space

AERONAUTICS SPECIFIC SUPPORT ACTION Proposal

Proposal Title:

EUROPEAN PERSONAL AIR TRANSPORTATION SYSTEM STUDY - EPATS -

Institute of Aviation
Eurocontrol Experimental Center
MSystems
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
Wandrose Air JetCenter GmbH

Warsaw, March 2006

EUROPEAN PERSONAL AIR TRANSPORTATION SYSTEM EPATS - STUDY



EPATS STUDY – first step

Proposal abstract:

The EPATS (European Personal Air Transportation System) focuses on Target Concepts: Highly Customer Oriented, Time and Cost Efficient and Pioneering the Air Transport Towards the Future.

The Future EPATS will explore a niche between Surface and Scheduled Air Transport.

The EPATS will provide wider use of small aircraft, served by small airports, to create access to more communities in less time.

The goal of the SSA proposal is to evaluate the needs, and to prepare a new European Air Transportation System, based on society needs and innovation.

The EPATS study will address the following issues:

- The potential new market for personal aviation up to 2020.
- The impact of this new way of transport on the European ATM, and as well as the environmental, safety and security issues involved.
- The technical requirements for this class of aircrafts.
- The R&D programme, to be included in the European Research Area.

The deliverable of the study will be an added value for Europe: a requirement, R&D programme as a recommendation for FP-7, and implementation.

A dissemination workshop will share the results of the study with stakeholders - to promote the EPATS idea, create new market segments and revitalisation of the European General Aviation Industry.

The EPATS SSA proposal fits in the framework of FP6-2002-Aero-2 area of Aeronautics Specific Support Actions, especially: "Development strategy in the sector", "Promoting SME participation" and "Promoting participation".

Main challenge of programme EPATS:

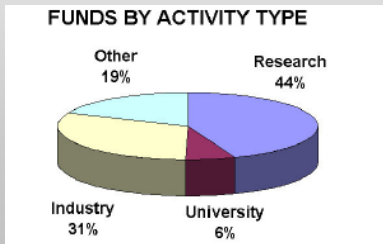
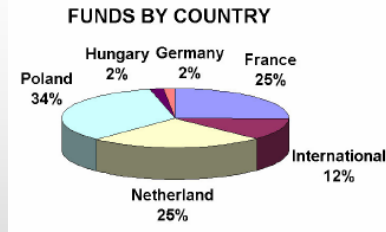
- To explore a niche between Surface and Scheduled Air Transport.
- To provide wider use of small aircraft, served by small airports, to create access to more communities in less time, and revitalization of European General Aviation Industry.
- To reduce „doorstep to destination” travel time, and increasing daily radius of action of people.

Main objectives of EPATS STUDY (SSA):

- To identify the new market for personal aviation in Europe, to define „feasibility study” (impact on ATM, airport infrastructures, environment, safety, security, innovative technologies for new personal aircraft) and preliminary „road map” of EPATS implementation.
- To define „Key Players”, and to organize „workshops” for public discussion about EPATS.
- To finalize „Road Map” of EPATS implementation, and to prepare set of EPATS goals to Strategic research Agenda and FP 7 and FP next.



Consortium

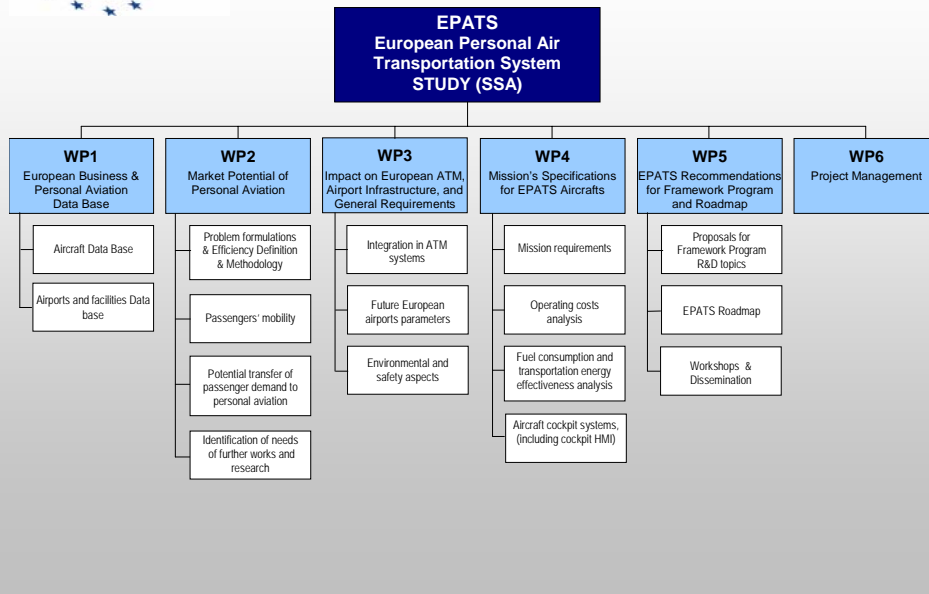


Partic. No.	Participant name	Partic. short name	Country
1	Institute of Aviation	IoA	Poland
2	Eurocontrol Experimental Center	EEC	Europe
3	M3systems	M3S	France
4	National Aerospace Laboratory	NLR	Netherlands
5	Polskie Zakłady Lotnicze sp. z o.o. w Mielcu	PZL M	Poland
6	Rzeszow University of Technology	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

Participants are 10, from 5 European countries (Poland, France, Netherlands, Germany and Hungary) and 1 international (Eurocontrol); 2 are RES, 3 are IND, 2 HE, 2 OTHER; two participant are SME.



Project structure



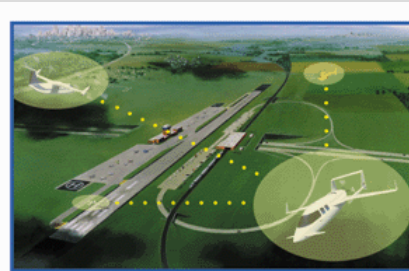
Project deliverable

Del. No.	Deliverable name	Lead participant	Delivery date (proj. month)
WP1 European Business & Personal Aviation Data Base (IoA)			
D1.1	Report on European Business & Personal Aviation Data Base and findings.	IoA	M6
WP2 Market potential of personal aviation (M3S)			
D2.1	Potential transfer of passenger demand to personal aviation by 2020 and needs of further R&D works.	M3S	M12
D2.2	Experts seminar	IoA	M3
WP3 Impact on European ATM, Airport Infrastructure and General Requirements (NLR)			
D3.1	EPATS ATM General requirements & related issues to be solved.	EEC	M15
D3.2	EPATS Airports General requirements, safety and environmental aspects & related issues to be solved.	NLR	M15
WP4 Missions Specifications for EPATS Aircraft (IoA)			
D4.1	EPATS aircraft missions specification	IoA	M15
D4.2	Operating Costs Analysis Report	IoA	M12
D4.3	Fuel consumption and transportation energy effectiveness Analysis Report	RzUoT	M12

Del. No.	Deliverable name	Lead participant	Delivery date (proj. month)
WP5 EPATS recommendations for FP and ROADMAP (IoA)			
D5.1	EPATS Research and Development Program	IoA	M18
D5.2	EPATS Roadmap	IoA	M18
D5.3	Joint meeting with SESAR	EEC	M12
D5.4	Joint meeting with CESAR	IoA	M13
D5.5	Workshop	IoA	M15
D5.6	Berlin Airshow Conference	AD Cuenta	tbd
D5.7	EPATS presentation CD Rom	IoA	M18
WP6 Project Management (IoA)			
D6.1	Management reports of kick-off, mid-term progress, and final	IoA	M1, 9, 18
D6.2	Project Management Plan	IoA	M3
D6.3	EPATS website, and filmsy	IoA	M3
D6.4	Financial statements (end year, final)	IoA	M12, 18

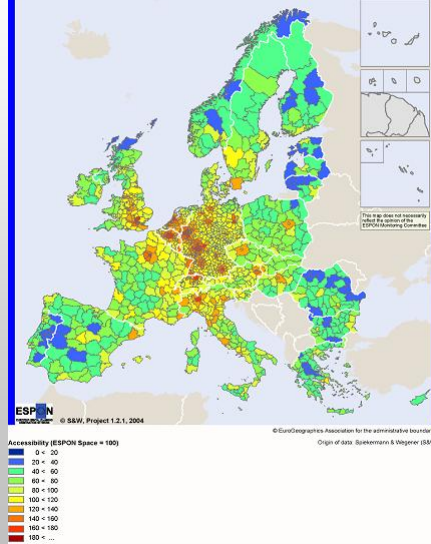
Main EPATS Question

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

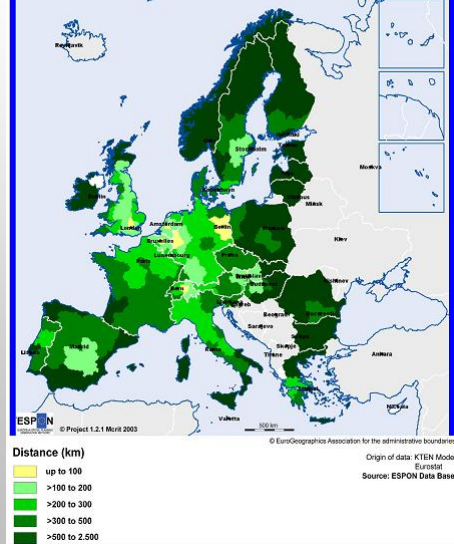


Worst multimodal accessibility – long car trips

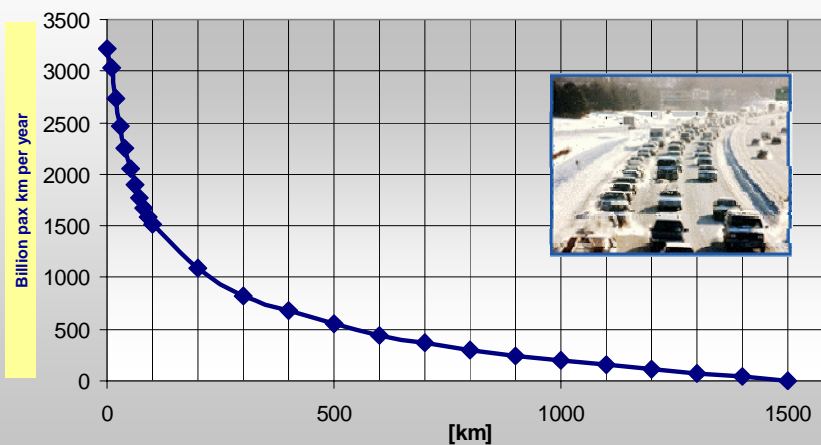
Potential accessibility, multimodal, 2001



km per person in generated by car / Purpose: business



European Car Transport Productivity



Distance longer than 300 km – European car productivity: 828 billion pax km per year



*25% European Car Transport Productivity =
ca 388 000 personal aircraft*

- If we replace the 25% of car transport productivity on a distance longer than 300 km by personal aircraft – **210 billions pax km/year** could be performed by airplanes.
- The average yearly flying time of a personal aircraft is 600 h, the block speed - 300 km/h and passengers number – 3 persons , than **the annual aircraft passenger kilometers is 540 000.**

That means, that the number of personal aircraft needed to substitute long distance car travel is :

388 000 personal aircraft.



*Example no 1 – Poland
Actual status*



- 1 – Hub
- 11 – Spokes
- 158 - Total number of airports

Example no 1 – Poland Actual status

Table 1 INTERREGIONAL AIR CONNECTIVITY AND MOBILITY IN POLAND

Passengers departures to: →

	Warszawa	Katowice	Poznań	Kraków	Wrocław	Łódź	Gdańsk	Lublin	Rzeszów	Bydgoszcz	Szczecin	Olsztyn	Kielce	Białystok	Opole	Gorzów Wlkp	
↑ Passengers arrivals from	Warszawa	16650	45107	98205	92620	329	96913		36299	19080	42150	168					349
	Katowice	16089															
	Poznań	45693															
	Kraków	96366															
	Wrocław	90060															
	Łódź	337															
	Gdańsk	98613															
	Lublin																
	Rzeszów	33941															
	Bydgoszcz	19375															
	Szczecin	42497															
	Olsztyn	160															
	Kielce																
	Białystok																
	Opole	259															
	Gorzów	443280															
	Regional Airlines																

880 000 – total passengers in 2005
13 – number of airplanes - 5 ATR-42 (48 pax) 8 ATR-72 (64 pax)
280 km – average distance
No interregional connections

Interregional passengers flow – gravity method

INTERREGIONAL AIR TRIPS DISTRIBUTION IN POLAND

Interregional Origin-Destination daily trips T_{ij}

Destination distance – longer than 200 km

	Warszawa	Katowice	Poznań	Kraków	Wrocław	Łódź	Gdańsk	Lublin	Rzeszów	Bydgoszcz	Szczecin	Olsztyn	Kielce	Białystok	Opole	Gorzów	
Warszawa		401	247	211	188		148		118	159	67					125	44
Katowice	219		92				33	40	52	41	24	20				15	17
Poznań	165	113		49			51	22	21			23	19	12		52	
Kraków	157		69		68		24	36		28	16	15				12	11
Wrocław	138			61			29	20	22	41	26	15	20	10		10	21
Łódź					0		52	48	42		29	34				22	21
Gdańsk	98	41	52	20	28	29		12	10					9	10	15	11
Lublin		36	16	23	14	20	9			9	5	6			8	10	3
Rzeszów	47	37	12		12	14	6			8	4	4			4	8	2
Bydgoszcz	71	33		15	26			8	7		14			0	5	13	0
Szczecin	35	23		11	19	13	15	5	5	16		6	4	3		3	
Olsztyn		21	20	11	12	16		8	8		6		5	0	7	4	
Kielce			26		26		12			14	7	8		7		5	
Białystok			16				10	8	9	7	3		4		5	2	
Opole				42			12	11	12	16	10	7			5		7
Gorzów	21	16		7	15	8	8	3	9			3	3	2	7		

GRAVITY METHOD
GDP as Attracting Force – directly proportional to region GDP
Distance as Friction – inversely proportional to distance between regions

Interregional passengers flow – gravity method

INTERREGIONAL AIR TRIPS DISTRIBUTION IN POLAND

Interregional Origin-Destination daily trips T_{ij}

	Warszawa	Katowice	Poznań	Kraków	Wrocław	Łódź	Gdańsk	Lublin	Rzeszów	Bydgoszcz	Szczecin	Olsztyn	Kielce	Białystok	Opole	Gorzów	
Warszawa		401	247	211	188		146		118	158	67					126	44
Katowice	219		92				33	40	52	41	24	20		15			17
Poznań	165	118		49			51	22	21					12		52	
Kraków	167		59		68		24	36						10			21
Wrocław	133			61										22			21
Łódź														10		15	11
Gdańsk	98	41	52											8		10	3
Lublin		36	16		14						5			8	10		3
Rzeszów	47	37	12								4			4	9		2
Bydgoszcz	71	33									4			5	13		0
Szczecin	95	23		19			16			1				6	4	3	8
Olsztyn		21	20		4						6			6	0	7	4
Kielce			28				12		14		7			7		7	5
Białystok		16				10	8	9	5	7	3			4		6	2
Opole	66		42				12	11	12	16	10			7		6	7
Gorzów	21	16			7	15	8	9	3				3			2	7

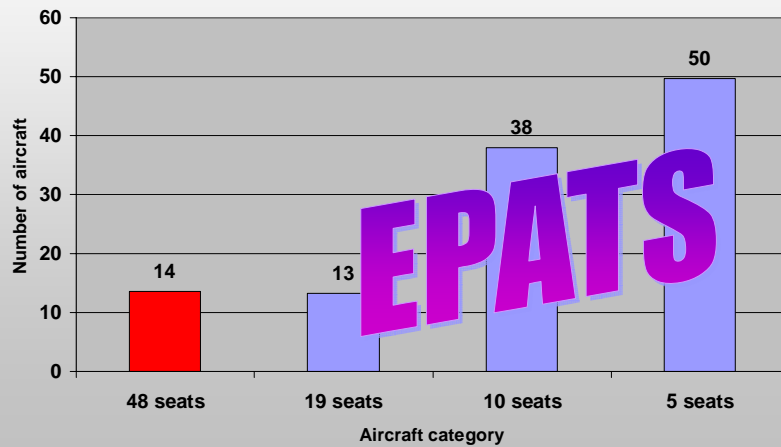
	seats	links	daily trips	share	min. acceptable daily flow per aircraft type	number of aircraft	
AIRCRAFT	AIRLINERS	48 seats	18	2583	0,48	95	14
		19 seats	22	1051	0,20	40	13
		10 seats	73	1444	0,27	19	38
		5 seats	52	298	0,06	3	50

5376

114

Interregional passengers flow – gravitational method

Aircraft fleet distribution



EPATS COMPONENTS:

- **Network of all existing airports and airfields in Europe**
(satisfying the EPATS requirements);
- **Piston, turboprop and jet aircraft**
(having a capacity from 4 to 19-seats, fulfilling the requirements of FAR-23 or CS-23 and performing EPATS missions specifications)
- **Air traffic management and control systems**
(adapted to air traffic generated by the EPATS)
- **Air carriers organizations**
(offering regular transport on the relatively low flow density – from 2000 to 15000 pax per year with 5 days per week - there and back again, daily trips guaranteed),
- **Charter flights**
(for small passenger groups – from 4 to 19 persons, traveling with various purpose: business, recreational, family)
- **Air taxi companies** *(doing on-demand service)*
- **Aircraft owners and users associations** *(Fractional Ownership Programmes)*

