WP2:1 Small Air Transport Aircraft Demand

Isabelle Laplace, M3 Systems
Stefaan Ghijs, Fly Aeolus
Daniel Rohacs, University of Budapest

Context and objectives

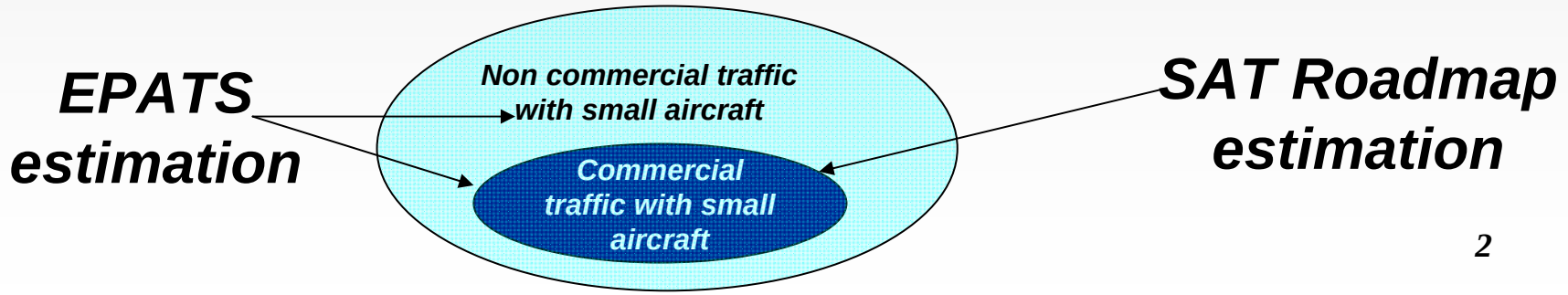
WP context:

- *Gross estimation of the potential transfer of traffic to Personal Air transport made in the EPATS project (2008): 43 million flights in 2020 (commercial and non commercial flights with small aircraft)*

- *In the project SAT-RDMP we focus on commercial flights with small aircraft*

WP Objective:

Estimation of the small air transport demand in 2030 for commercial purpose



How getting Small Air Transport demand estimation?

1. *Model building*
2. *Model validation for the base year 2010*
3. *Estimation results for 2030*
4. *Sensitivity analysis*

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Choice of the applicable demand model

•*State-Of-the-Art made between existing applicable demand model*

•*One method reveals the most relevant for estimating the small air transport aircraft demand:* ***The Generalized cost model,*** *based on the generalized cost maximisation principle*

- *Data available*
- *Estimation technically feasible within the specified time frame*
- *The model can be easily operated, maintained and validated*
- *Sensitivity analysis can be made*

Generalized cost model

Generalized cost model :

$$C_g = C_{monetary} + \sum C_{non\ monetary}$$

- *Monetary: direct cost borne by the traveller (out of pocket cost)*
- *Non monetary: cost associated to the time spent in the travel (subjective cost)*
- *Main principle: a traveller will choose the transport mode that minimizes his/her generalized cost*

Monetary cost

The direct cost of travel by transport mode groups:

- *The direct cost borne to access the transport mode (e.g. access cost to the airport):* C**access**

- *The direct cost borne for travelling with the transport mode (air fare, cost of car using, etc.):* C**transp**

- *The last direct cost borne to leave the transport mode and reach the final destination:* C**egress**

$$C_{acces} + C_{transp} + C_{egress}$$

Non Monetary cost

The cost of time depends on:

- *The time spent in traveling*
- *The value that the traveller attributes to this time*

The travel time can be separated in:

- *The access time (access to transport terminal+time spent at terminal for procedures)* T**access**
- *The journey time* T**transp**
- *The time to reach the final destination* T**egress**
- *The additional time (breaks made in very long-distance trips performed by car)* T**add**

$$V_T.(T_{acces} + T_{transp} + T_{egress} + T_{add})$$

Improvements in the new model compared to the EPATS model

•Use of more accurate travel time between NUTS2 connections thanks to the use of *the ETIS* database (European Transport Policy InformationSystem) taking in consideration the available infrastructure

•Use of more accurate values of time:

- One specific value of time for each person traveling on a certain connection: *values of time are generated by a Monte carlo simulation based on a survey that investigated the annual income of international business travelers*
- Different values of time by segment of the entire door to door travel process (access time, waiting time, in vehicle travel time, Egress time) to take into account that people experience different parts of the travel process in a different way

•Use of information on service frequency: for commercial airlines and high-speed rail companies

Transport modes

Considered transport modes:

- *Car*
- *Commercial airlines*
- *High-speed railway companies*
- *Small air transport aircraft*

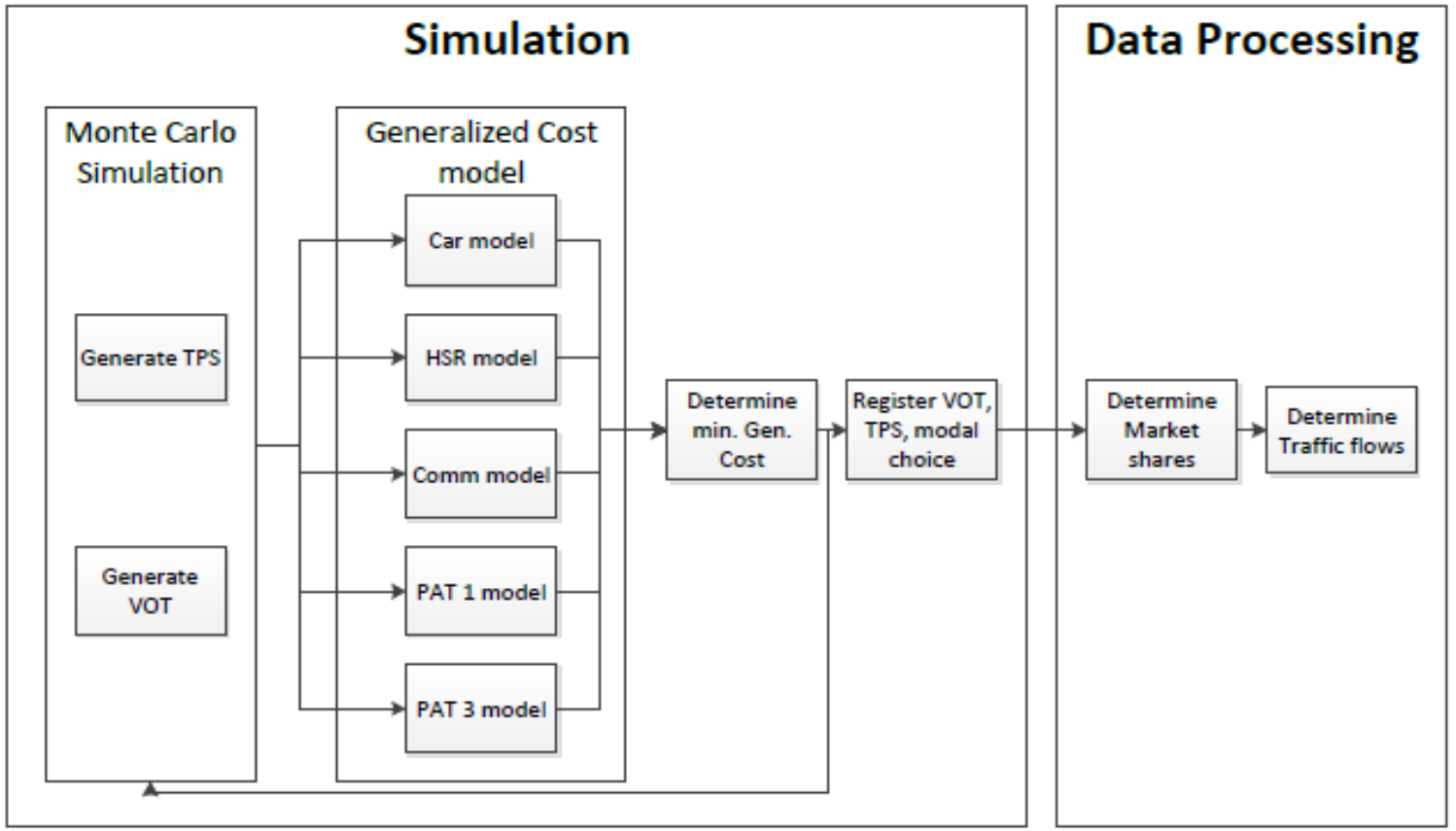
Three categories of small air transport aircraft:

- *Piston*
- *Turboprop*
- *Jet*

Data sources:

- *ETIS (European policy Transport information System)*
- *DATELINE*
- *UK survey on international business travellers*

New built model



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Demand estimation for 2010

In 2009, traffic of 239 000 commercial flights (source EUROCONTROL, *„Getting to the Point:Business Aviation in Europe", 2009*) with small aircraft

Estimation provided by the model for 2010 is:

209 000 commercial flights with small aircraft

⇒ Coherent estimation with known traffic estimations of small aircraft

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Demand estimation for 2030

Assumptions made between 2010 and 2030:

- Fuel cost variation: +3.7% per year
- Car cost variation: multiplied by 1.39 between 2010 and 2030
- Commercial airlines fares variation: 1% per year
- High-speed rail fares variation: 1% per year
- Small aircraft cost variation: -20% between 2010 and 2030

Total demand estimation for 2020-2025 (EPATS)

For the 2020-2025 period EPATS estimated a total traffic of:

43 million commercial and non commercial flights with small aircraft

Yearly traffic growth of 5.4% between 2005 and 2025

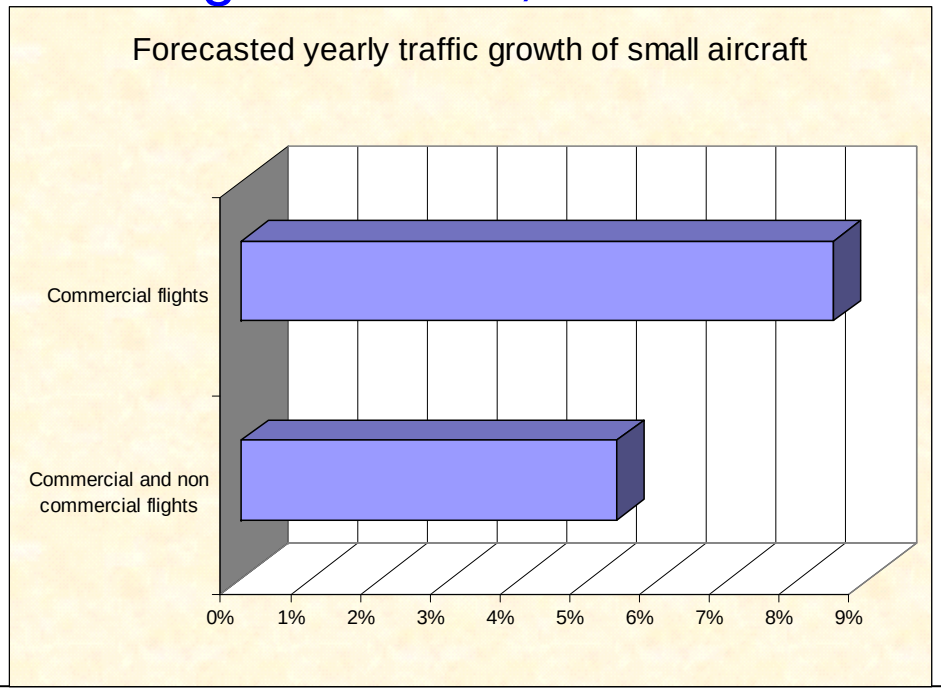
Coherent with the average traffic growth of 5% estimated by EUROCONTROL in „Business Aviation in Europe in 2010“

Demand estimation for commercial flights in 2030

Estimation provided by the model for 2030 is:

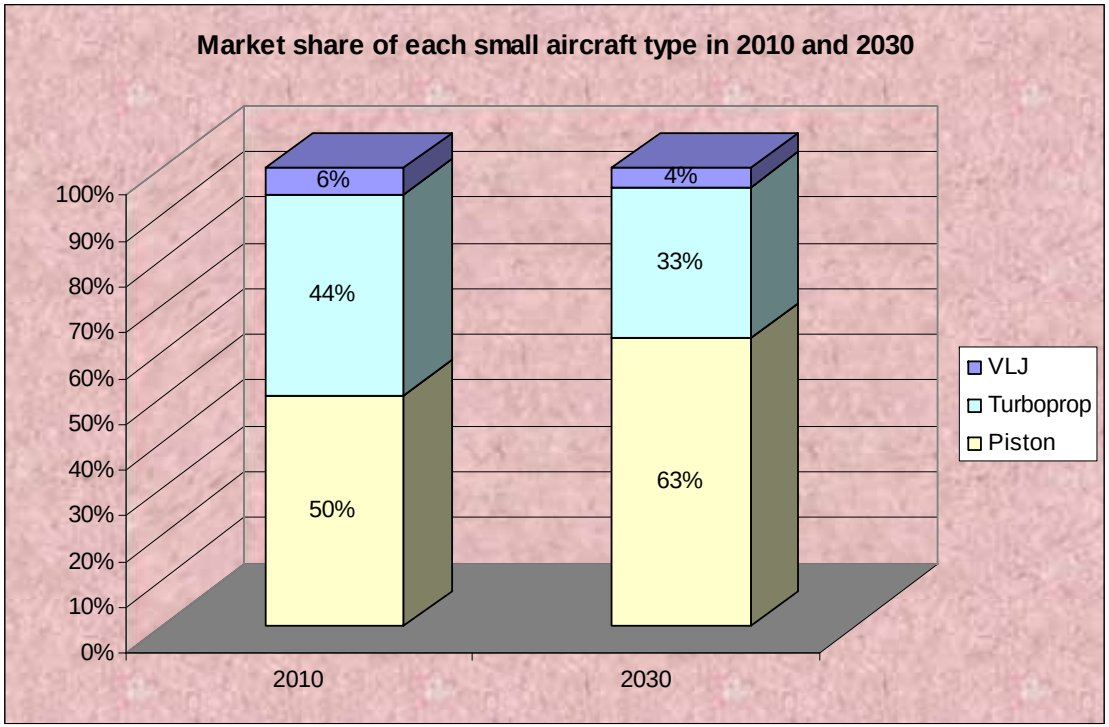
1.1 million commercial flights with small aircraft

Yearly traffic growth of 8,5% between 2010 and 2030



Demand estimation for commercial flights in 2030

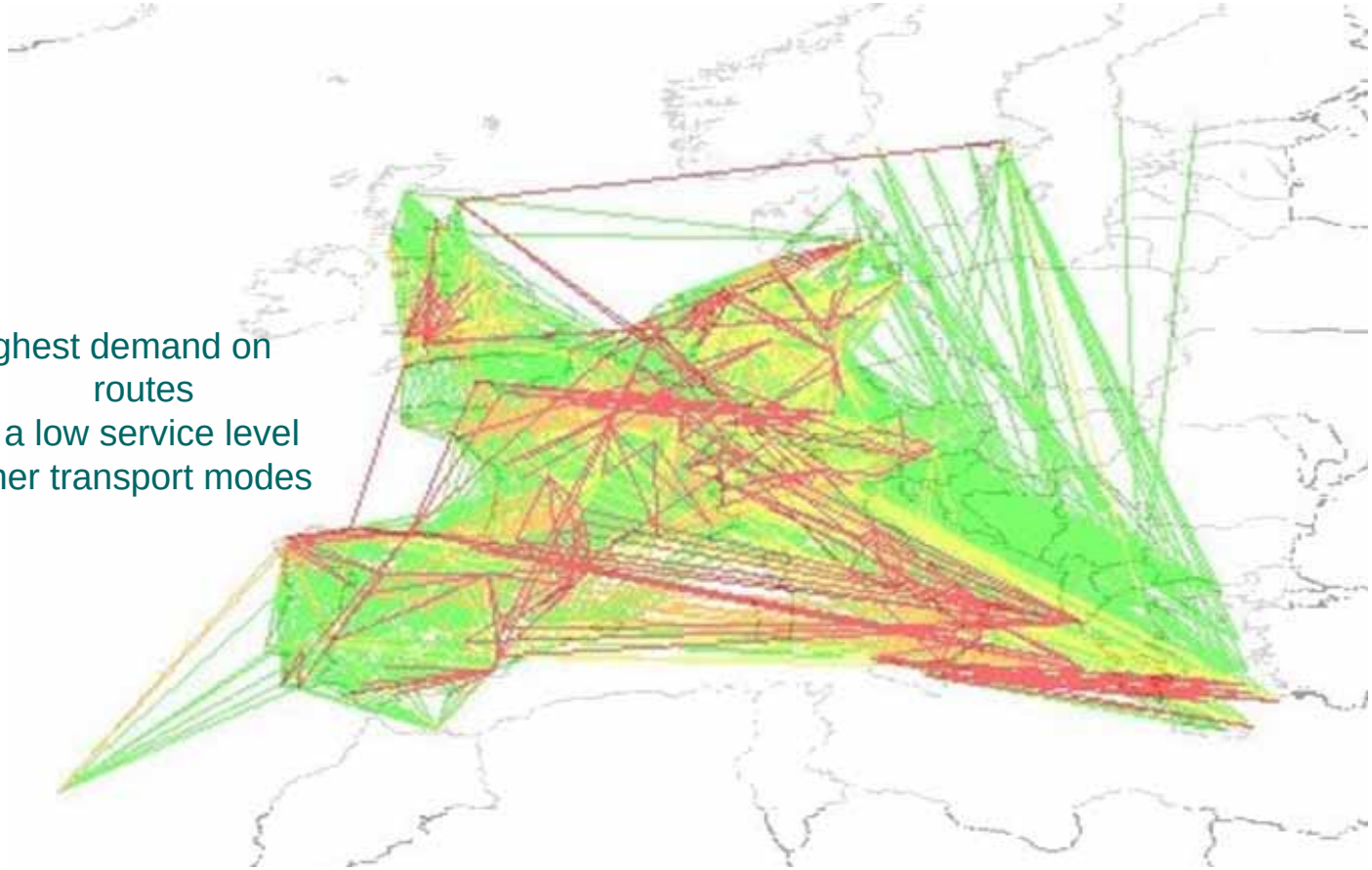
Increase of the Piston aircraft market share



Commercial personal aviation demand forecast by region

Green: 2-5, dark green: 5-1, orange: 12-25, red: 25+ flight / day

Highest demand on routes with a low service level of other transport modes



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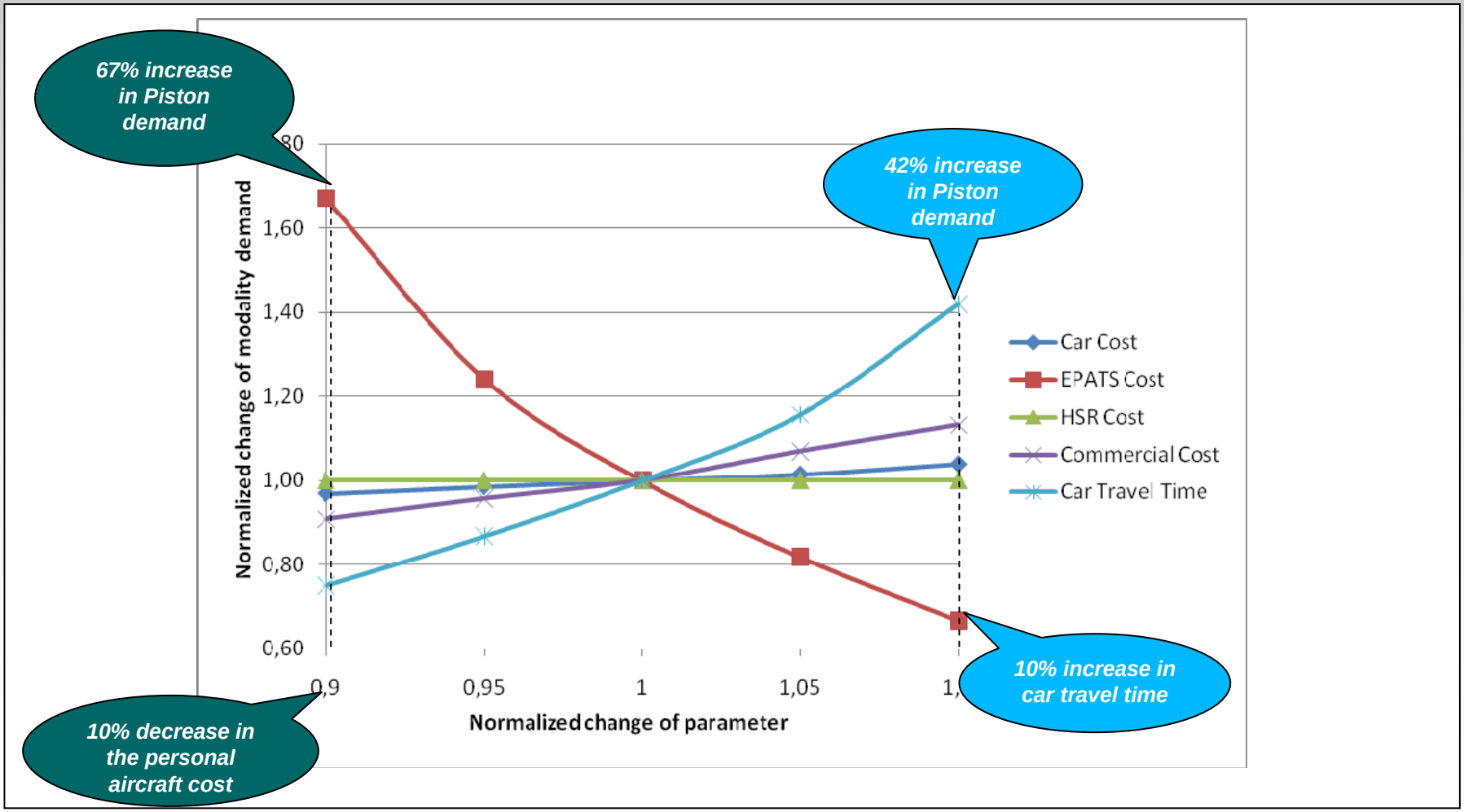
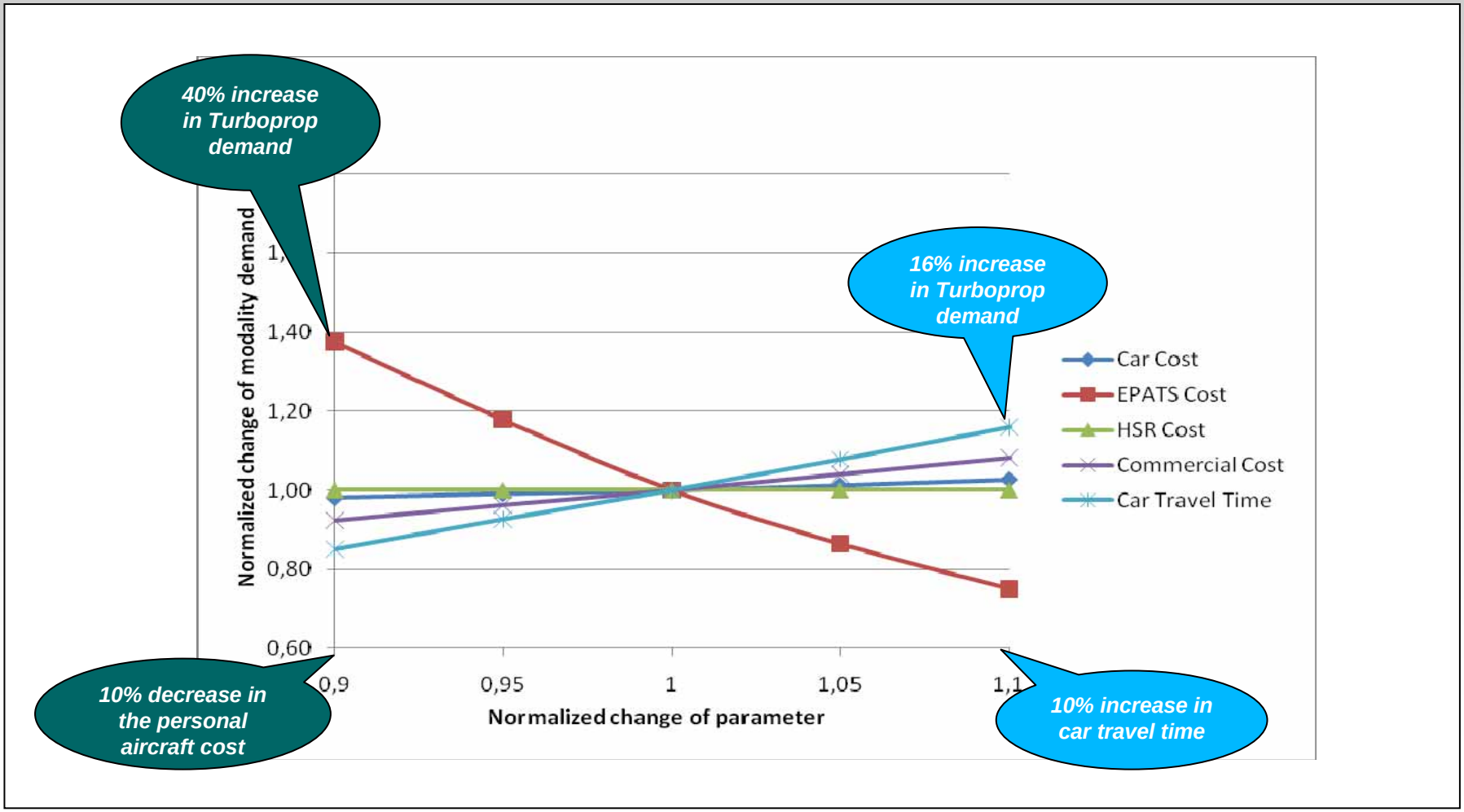
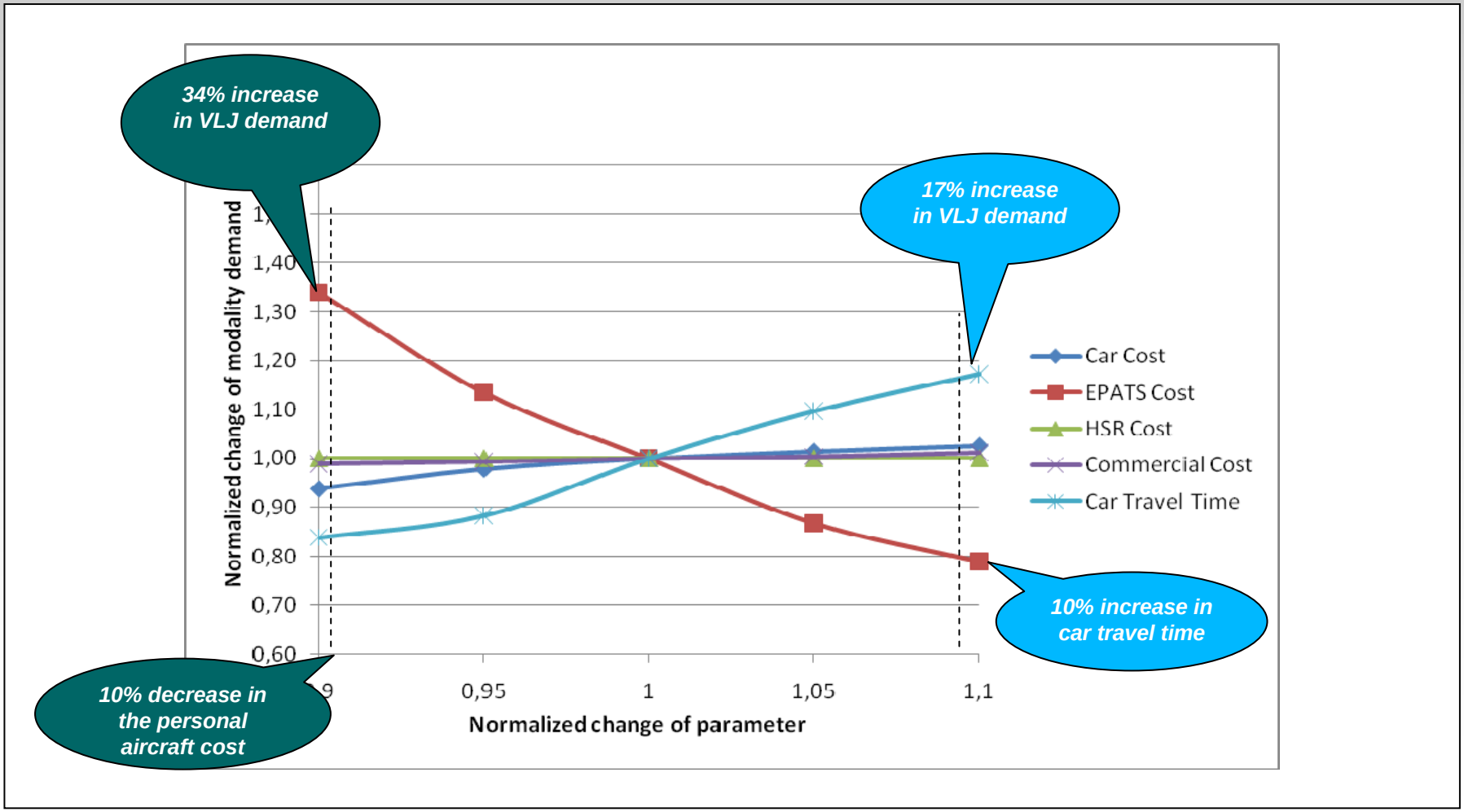
Piston aircraft demand sensitivity



Turboprop aircraft demand sensitivity



Very Light Jet aircraft demand sensitivity



Concluding remarks

Features of future small air transport demand:

- Higher yearly growth rate for commercial flights (8% vs 5% for commercial and non commercial flights)
- Increase in the Piston aircraft market share (63% vs 50% in 2010)
- Highest demand on routes with a low service level of other transport modes
- High sensitivity of personal aircraft demand(especially for Piston aircraft) to:
  - changes in personal aircraft cost
  - Changes in car travel time (i.e. to road congestion)