ATM Performance

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Dealing with Airport and Airspace Congestion in Europe

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Presentation

- Airport capacity
  - US and European policies
  - Observed results
- Airspace capacity
  - European ATM Performance
  - Recent initiatives
- Conclusion

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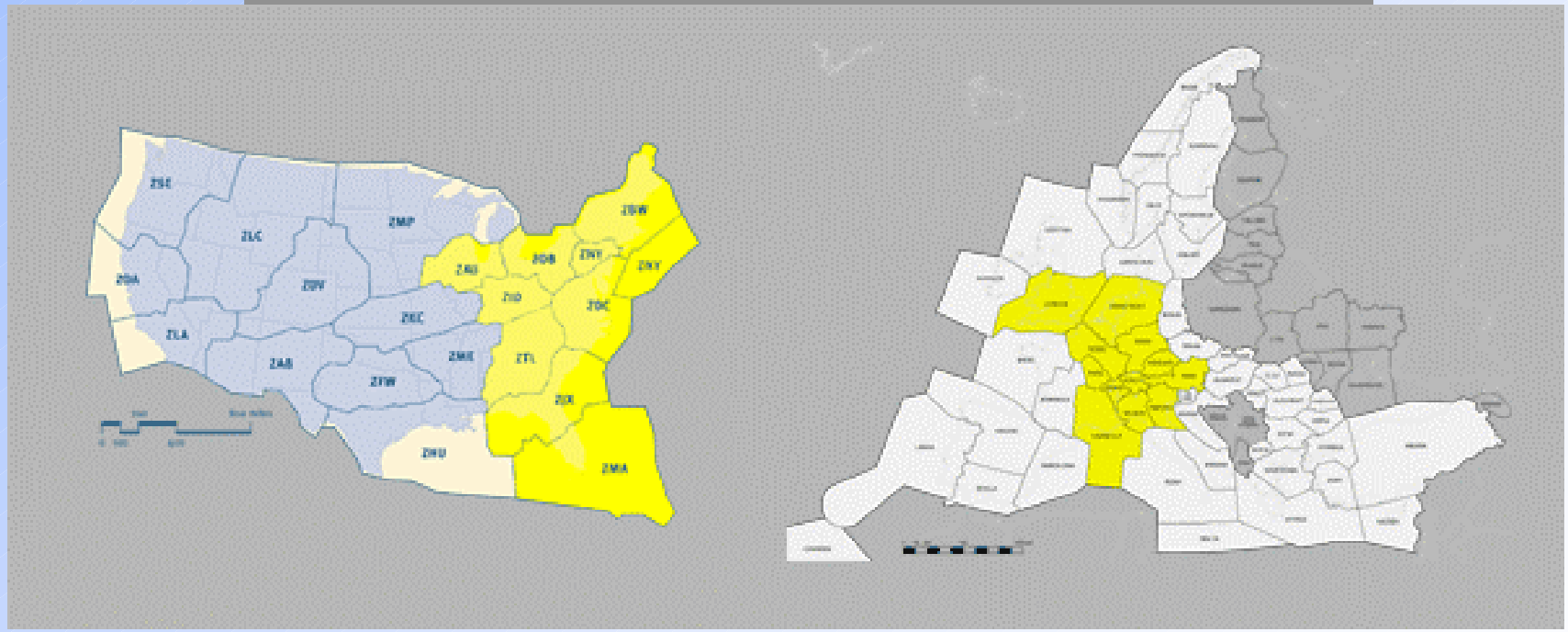
US and European ARTCCs



9.8 M km²
15.9 M flights
12700 M km

10.5 M km²
7.9 M flights
6300 M km

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Airport demand/capacity management

Airports	US	Europe
Demand	Uncapped (exceptions)	Capped (major airports)
Capacity	Higher in VMC	IMC
Bad weather	Less frequent	Frequent
Demand-Capacity Management	Taxi, Airborne delays	Airport scheduling

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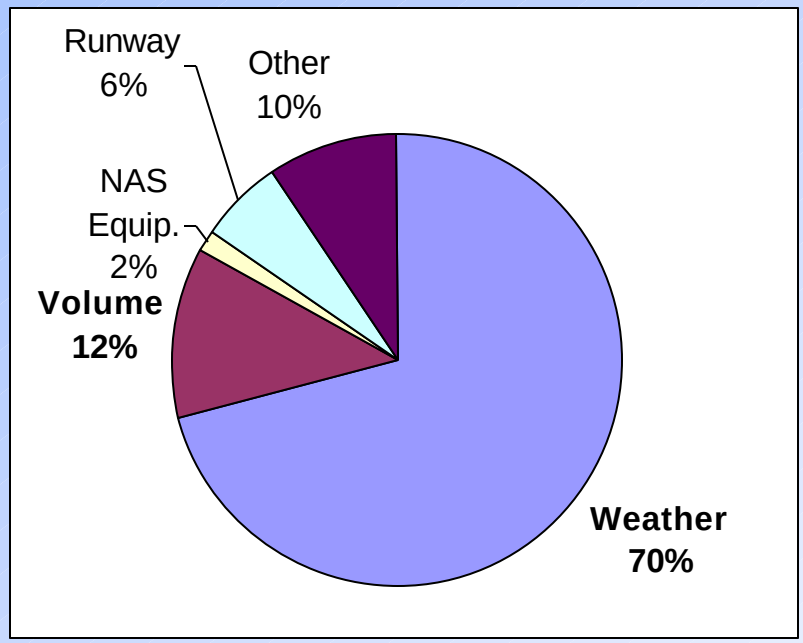
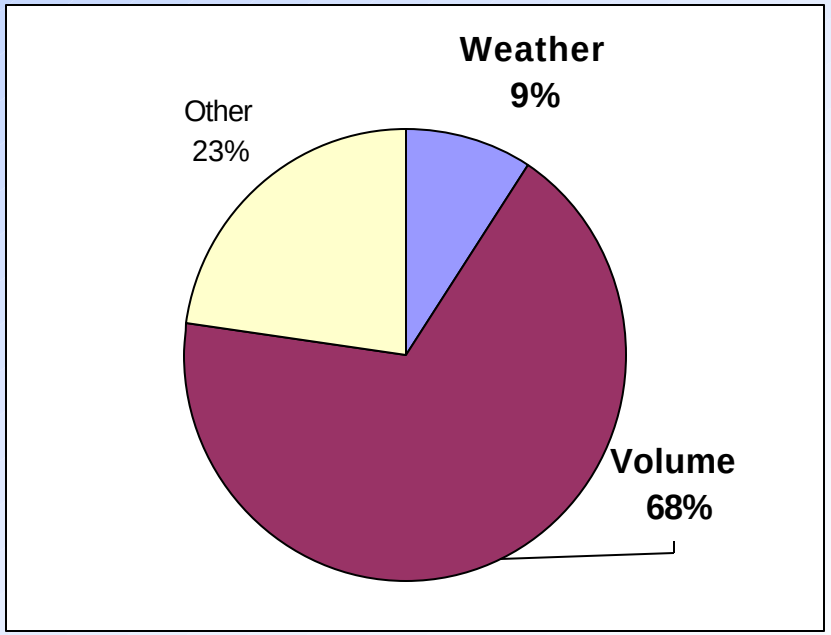
Delays managed by ATM



US 2000



Europe 2000

Airport capacity related ATFM delays: ~ 20%

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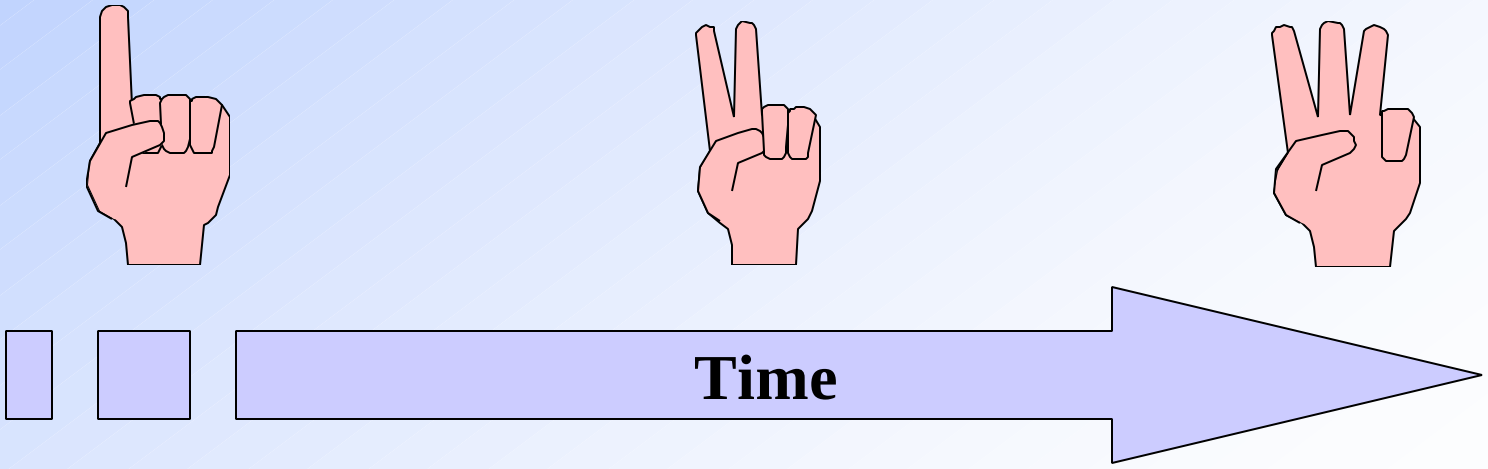
European ATM performance

Safety
Delay
Cost-Effectiveness

Access
Reliability
Predictability
Environment
Flight Efficiency

Flexibility
Equity



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European air traffic growth

1990-2000

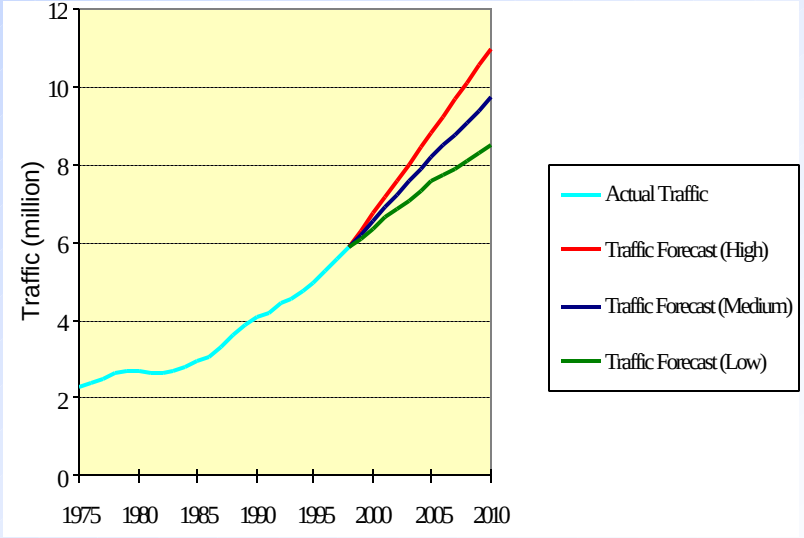
Strong traffic growth

+60% traffic

(4,8% p.a.)

+80% distance flown

(6% p.a.)



Driven by economic growth,
single market, single air transport market

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Air transport accidents

Europe 1975 - 2000

	US	Europe
Hull losses per 100 000 departures	0.5	0.6

3 collisions on the runway

IFR/IFR

1 Mid-air collision

Harmonised incident reporting standard applies from 2000

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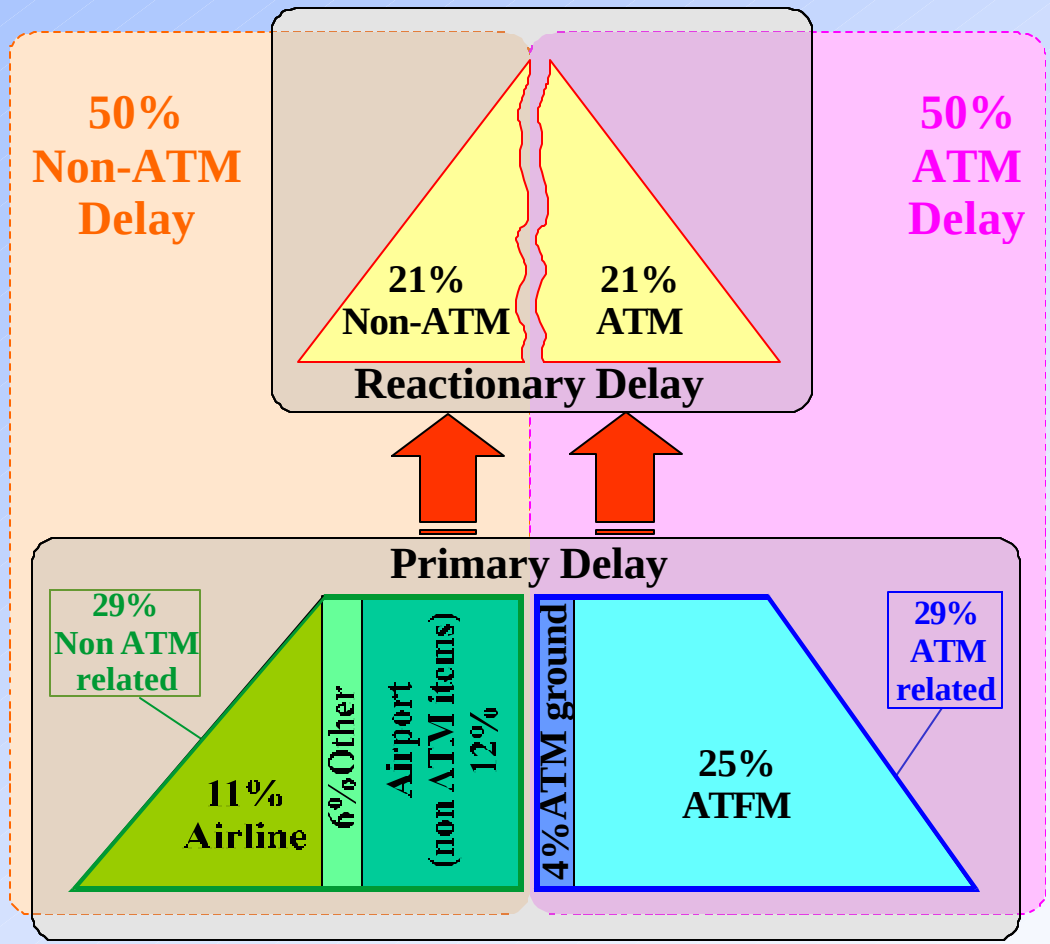
Air transport delay causes



Based on airline reports using IATA delay codes (1999)

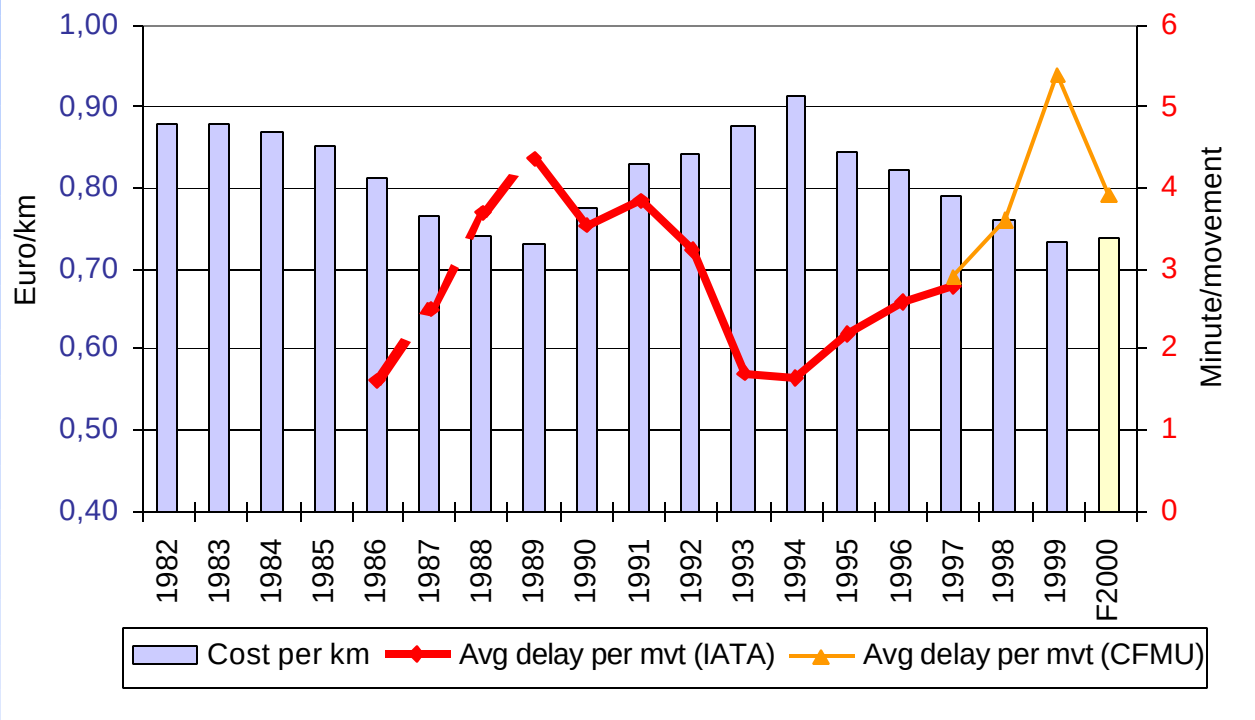
ATM delays and costs

Traffic increase

Strategy 90's

Cost emphasis

Performance-oriented strategy



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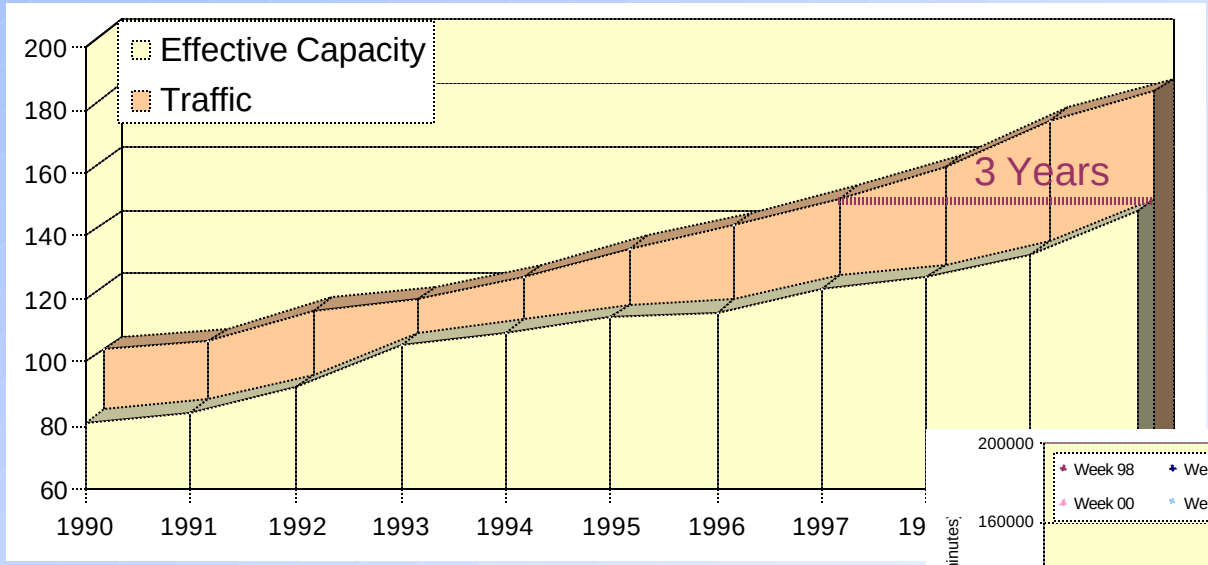
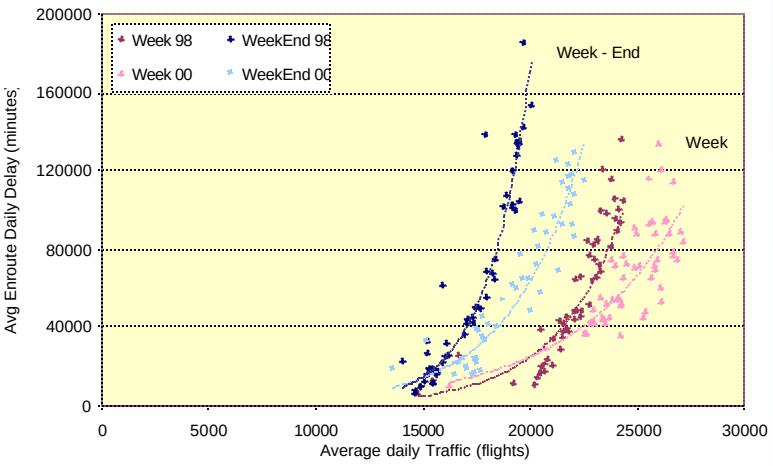
En-route capacity and demand





Capacity shortfall (~20%)
=> large ATFM delays

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Cost of en-route ATFM delays (2000)

	Delay minutes	Unit cost (Euro)	Total value (Million Euro)
Airlines			
ATFM delays	24 million	40-66	960 - 1 584
Reactionary delays	12 million	28	336
Total airlines related costs	36 million		1 296 - 1 920
Passenger costs	36 million	46-60	1 656 - 2 160
Total ATFM delay costs			2 952 - 4 080

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Existing features

- Route charges (user fees)
  - Recovery of costs declared by States
  - National unit rates
  - User charged according to filed route
  - Collected centrally (except terminal charges)
- Central Air Traffic Flow Management
  - Ground holding: Take-off slots allocated on first filed-first served basis for most penalising restriction (airport and airspace capacity)

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Recent strategic initiatives

- Institutional strategy (1997)
  - Revised EUROCONTROL Convention
    - Majority “binding” decision making
    - “Hard” safety regulation (SRC)
    - “Soft” performance regulation (PRC)
  - Distributed service provision (monopolies)
- ATM 2000+ strategy (2000)
  - Strategy, road map, sub-strategies (COM,…)
  - Objectives

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ATM 2000+ strategy objectives

- Increase Safety levels
  - Total number of incidents/accidents capped
- Meet traffic demand

  (Study on constraints to growth)
- Reduce total unit costs to users
  - Direct (routes charges) + indirect (delays, …)

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En-route capacity management

En-route	US	Europe
Demand	Unlimited	Unlimited
Capacity	7 choke points	Major issue (mostly upper)
Severe Weather	Frequent	Less frequent
Demand-Capacity Management	Rerouting MIT Ground hold (Exceptional)	Ground hold

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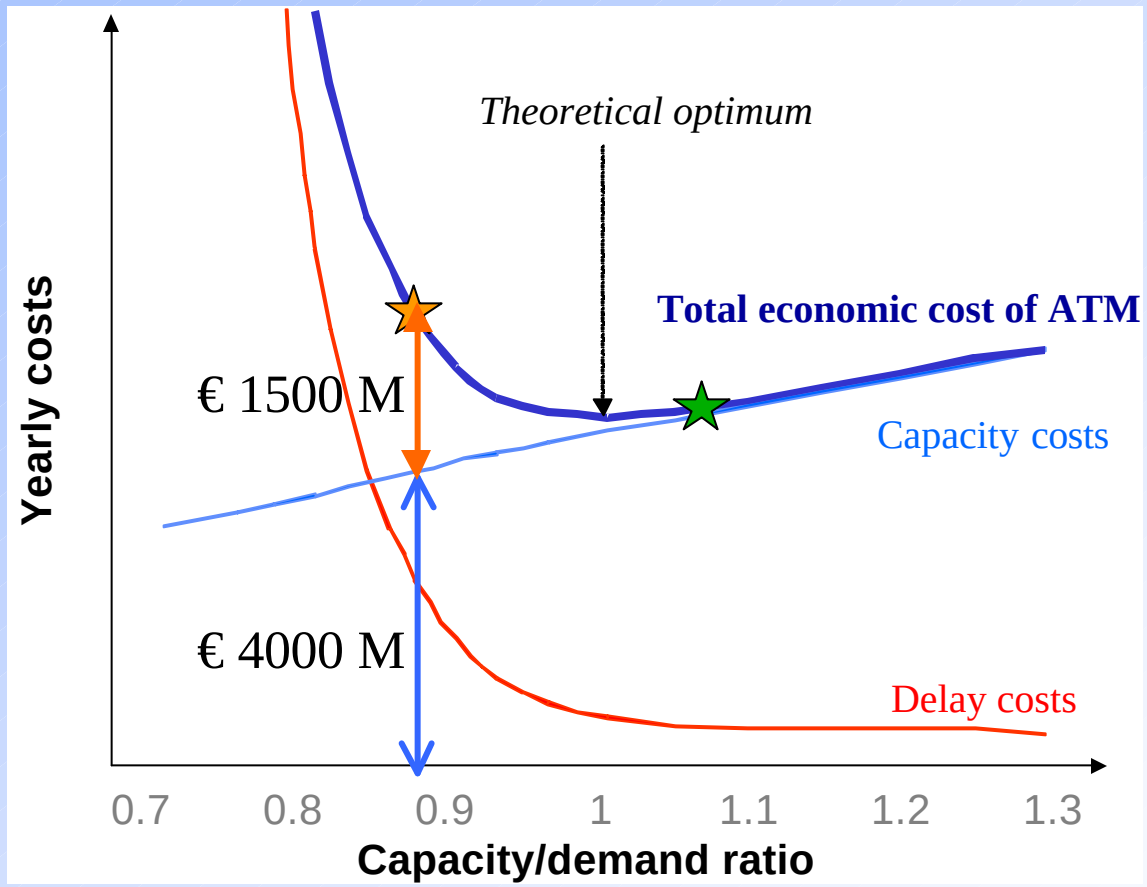
Capacity/Delay Trade-offs



En-route

Capacity target:
Theoretical optimum
Some spare capacity
for unforeseen growth

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Airspace capacity management

- Short term
  - Agreed European target => Individual targets
  - Providers' "best effort"
    (optimised use of existing resources)
  - Next summer ATFM delay forecast
- Medium term
  - Capacity and resource planning (top down + bottom up)
  - New features (e.g. continental RVSM)
- Long term (R&D)

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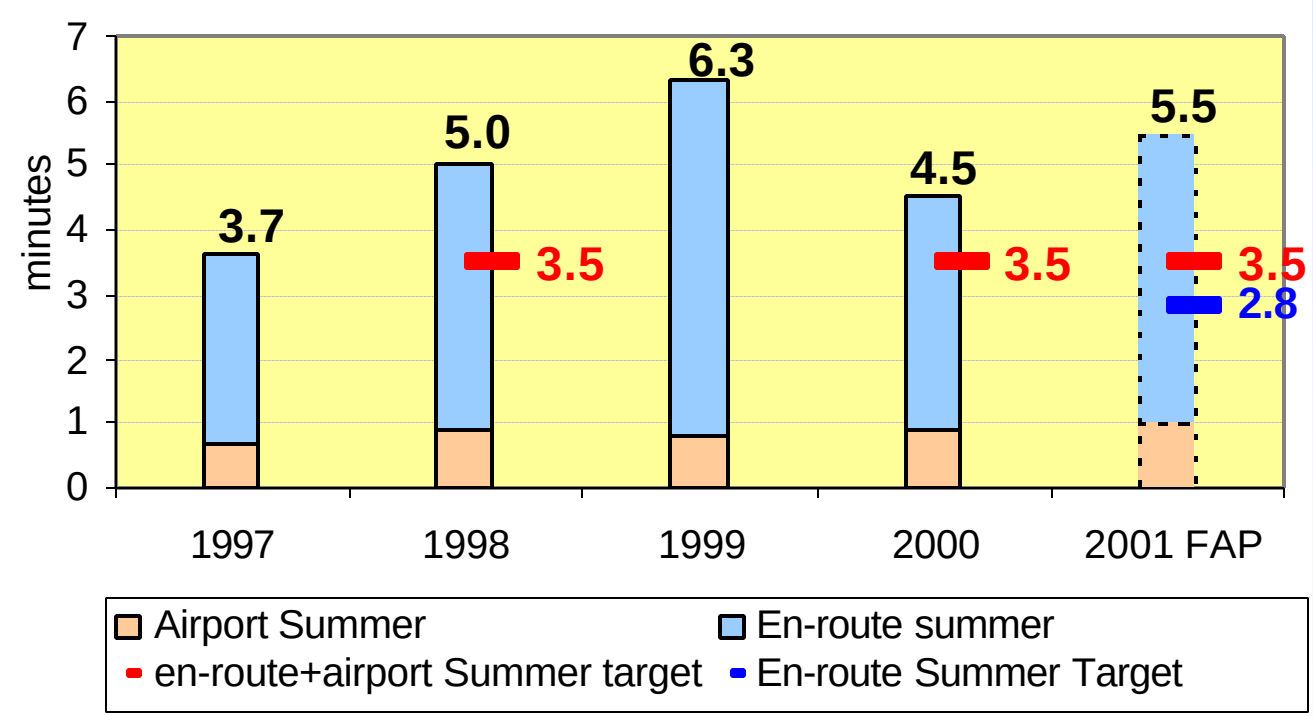
European ATFM delays



Airport capacity related ATFM delays: ~ 20%

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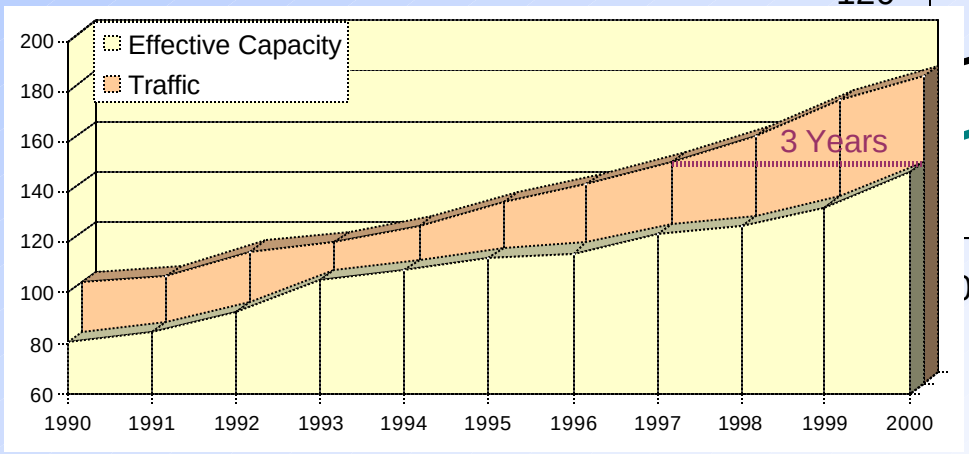
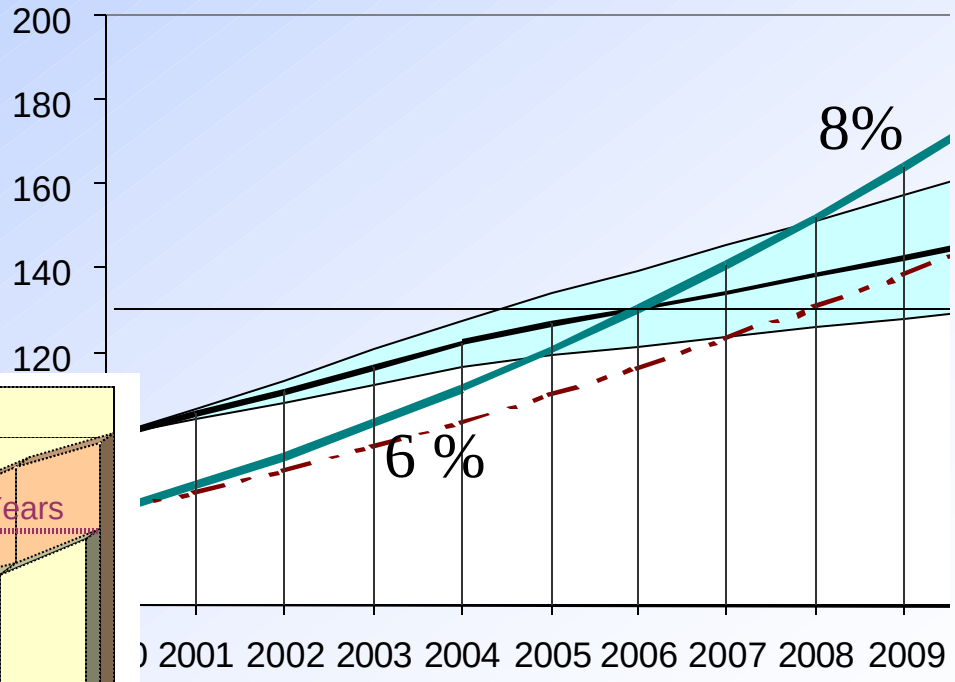
Reaching optimum capacity





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Cost effectiveness

- Benchmarking across European providers
  - Econometric techniques, R^2= 0.96
  - Range: -23%, +57%
- Comparison with the USA
  - Cost ratio per flight or distance unit

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Single European Sky

- High Level Group report (Dec 2000)

  "Single Sky over single market"

  – Institutional framework
  – Effective regulation
    Safety, airspace, performance, technical standards
  – Involvement of all stakeholders, social dialogue
  – Performance review
  – Coherent airspace design

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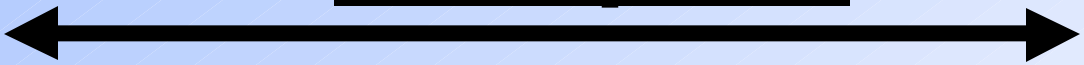
Governance

Ownership/control



State — Debt/users — Private

Legal status

State body — Private enterprise

Regulation

State — Performance Review (soft) — Central-federal

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UK case

NATS public-private partnership

- Majority private owner (49%)
- Economic regulation (price cap: RPI - X)
- with incentive for reducing delays

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Conclusions

- Airport capacity
  - Policy issue: more runways, capping, pricing?
  - ATM: Safety vs capacity policy decision
    - Moving the safety-capacity boundary?
- Airspace capacity
  - Traditional: airspace design (sectors, staff)
  - Airspace mgt (FUA), RVSM (2002), data-link
  - How to ensure independent providers deliver?
  - Incentives to providers: see UK experience