

Congested Airport Systems: Addressing Future Capacity Constraints

Chris Cain: Chairman of FARE and
Project Director, Newquay
Cornwall Airport

Scope of the Presentation

- Congested Airport Systems
- Potential Solutions
- The UK's Approach
- Lessons from London & Europe
- Challenges Facing New York
- Potential of Rail/Air and Secondary Reliever Airports
- Conclusions

Global Cities and Airports

- Strong correlation between global ranking of cities and airport capacity
- High value economic activities have a high propensity to use air travel
- HQ's or major presence for world leading companies/Governments/Institutions
- Airports offer global connectivity
- Global cities are often hubs for network carriers
- Major tourism/conference/exhibition venues
- **AIRPORT CAPACITY MAKES IMPORTANT CONTRIBUTION TO SECURING OR MAINTAINING GLOBAL CITY STATUS**

Activities in the Airport System

- Long Haul – Inter-continental
- Short Haul – Scheduled and Low Cost
- Charter – Holiday Packages
- Domestic/Commuter – RJs/Turboprop
- Freight – Bellyhold, Express, Freighters
- Private Business Aircraft and General Aviation
- Other – Emergency services, MRO, Military

**LOT OF SEGMENTATION OF ROLES IN
COMPLEX AIRPORT SYSTEMS**

Problems of Keeping Capacity in Line with Demand

- Classic airport bottlenecks are:
 - Air traffic systems
 - Runway and taxiway infrastructure
 - Terminal (apron, stands/gates, security, check-in)
 - Ground transportation
 - Environmental constraints
- Anyone bottleneck can constrain demand
- More complicated in multi-airport systems due to geographical and functional segmentation
- **ADDRESS ISSUES IN A TIMELY, FLEXIBLE WAY THAT MAKES MAXIMUM USE OF ASSETS AND PERMITS INCREMENTAL RATHER THAN LUMPY INVESTMENT**

Potential Solutions

- New Airport – big bang solution
- Infrastructure at major airports (runways, terminals)
- Improve ATC – better use of existing infrastructure
- Modal switch – air to rail
- Develop secondary airports as relievers
- Regulation

Maintaining Airports Capacity in Global Cities – Different Models

- A number of different approaches worldwide:
 - Far East/Mid East – Large new purpose built airports (eg Beijing, Seoul, Hong Kong, KL, Osaka, Dubai); Tokyo unusual with two
 - Europe (1): Main and secondary low cost/freight (eg Brussels, Frankfurt, Madrid, Barcelona)
 - Europe (2): Berlin is following the Far East Model but retaining a secondary low cost/Bus Av Airport
 - Europe (3): Two +20mppa and secondary low cost/Bus Av (eg Paris, Milan)
 - USA/Canada: Mix of all the above at San Francisco, Dallas/Forth Worth, Chicago, Denver, Washington
- Depends on global economic position, market maturity, airline structure, presence of low cost, route structure, political symbolism, condition of assets/opportunity etc

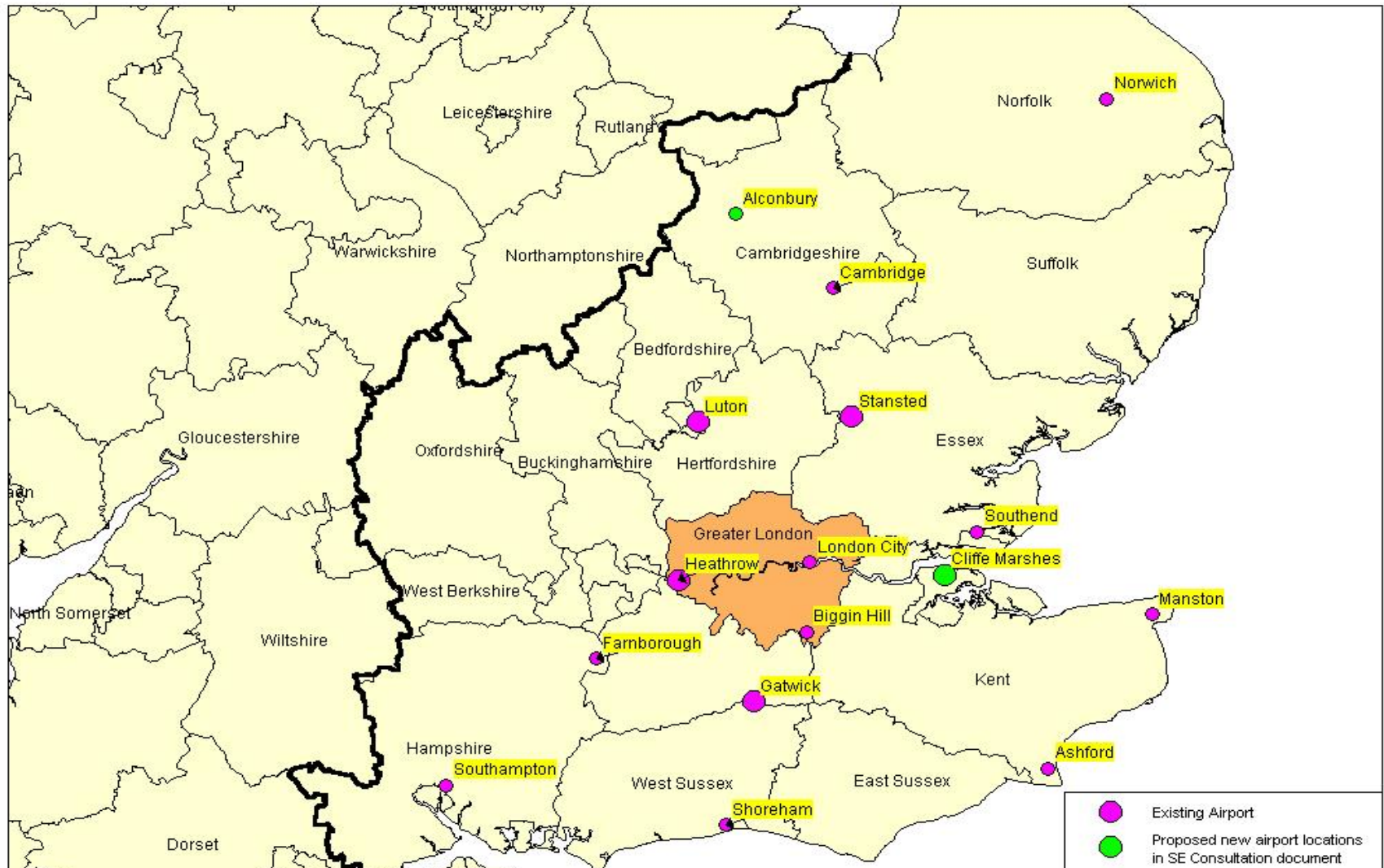
Global Cities - 3 Airports Systems

- If major airport is defined as +20mppa, only two cities qualify -London (135m) and New York (c100m). These are recognisably "World Cities"
- Los Angeles close - 90m, but one major (LAX) and 4 medium (Orange County, Ontario, Burbank, Long Beach) as relievers
- Paris – 85m. Currently two (CDG and Orly), plus Beauvais for low cost/Bus Av facilities. Third major considered.
- UK National Policy looked at all options.
- New York considered to provide lessons for London; useful to do the same for the current capacity review in New York by considering London's experience?

Development of the London System

- LHR (1947), LGW (1960's), STN (1983)
- Function of major National Policy Reviews – always looked at new sites alongside incremental development
- Inertia about the runway issue following Stansted for 20 years; T5 took 15 years to build
- Political bullet consecutive Government's chose to dodge
- Late 1990, capacity constraints really biting as LHR and LGW at maximum use
- Functional and geographical segmentation of markets increasing

London and South East Airports



Recent Trends Heathrow

- Wide spaced segregated; tactical mixed mode
- Stable 65-70m
- ATMs constrained to 480k – growth via aircraft size
- Heavily point to point
- Network carriers relocate
- Alliance terminals
- Major ground transport and environmental issues
- Mixed mode or Runway 3
- Long Haul Inter-continental
- Business and premium leisure short and haul scheduled – 3 Alliances
- Interlining now c20% and falling
- Major bellyhold freight; VIP's only GA (President Obama insisted!)

Recent Trends LGW and STN

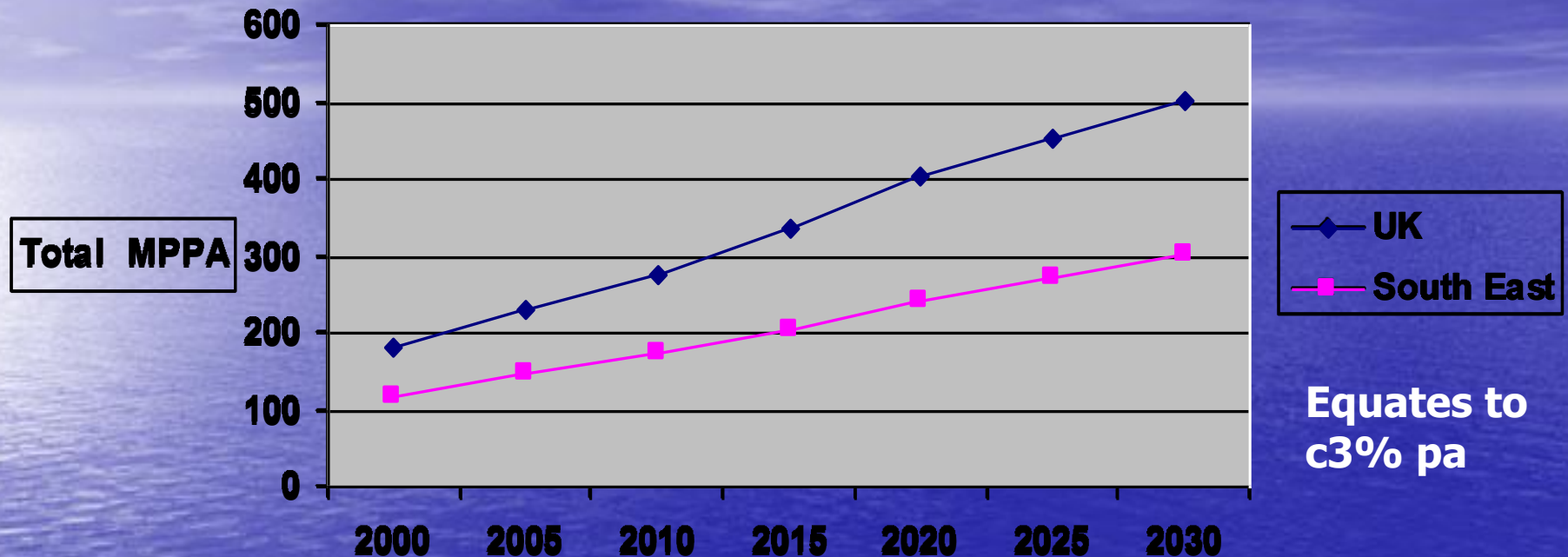
GATWICK

- Single runway: busiest in world 250,000 ATMs pa; up to 50/hr.
- Stable 30-35m pax: long haul reduced; little freight/GA
- Network carriers move away, low cost/charters keep volume
- Heavily point to point
- ATMs constrained by hourly movement rate/aircraft mix
- Ground transport and environmental issues minor;
- “Third a third a third” traffic mix strong financially
- If no runway at LHR obvious second hub

STANSTED

- Single runway; some capacity outside peaks
- Hourly movement rate less than LGW
- Low cost dominant
- Freight, private jet and other GA being squeezed
- Chosen as first new runway, but macro-forecasting missed overlaying airline business models
- R2 configuration and new terminal site identified
- Opposition from locals, environmentalists and airlines

Unconstrained UK Pax Forecasts

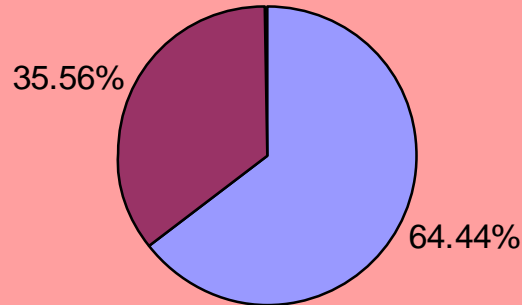


White Paper provided for two new runways at STN and LHR, meeting 470m of 500m forecast, 255m in SE system

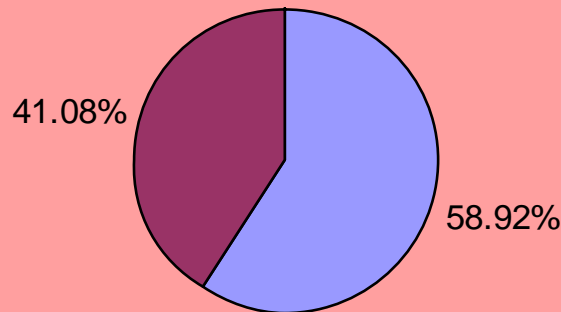
Unconstrained UK central forecast downgraded in 2006 and 2009 to 475m from 500m nationally, as a result of economic downturn and environmental taxation

Change in Share of Total Demand

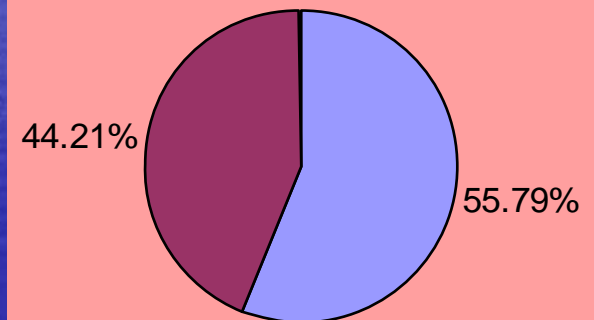
2000: 181 MPPA



2015: 325 MPPA



2030: 466 MPPA

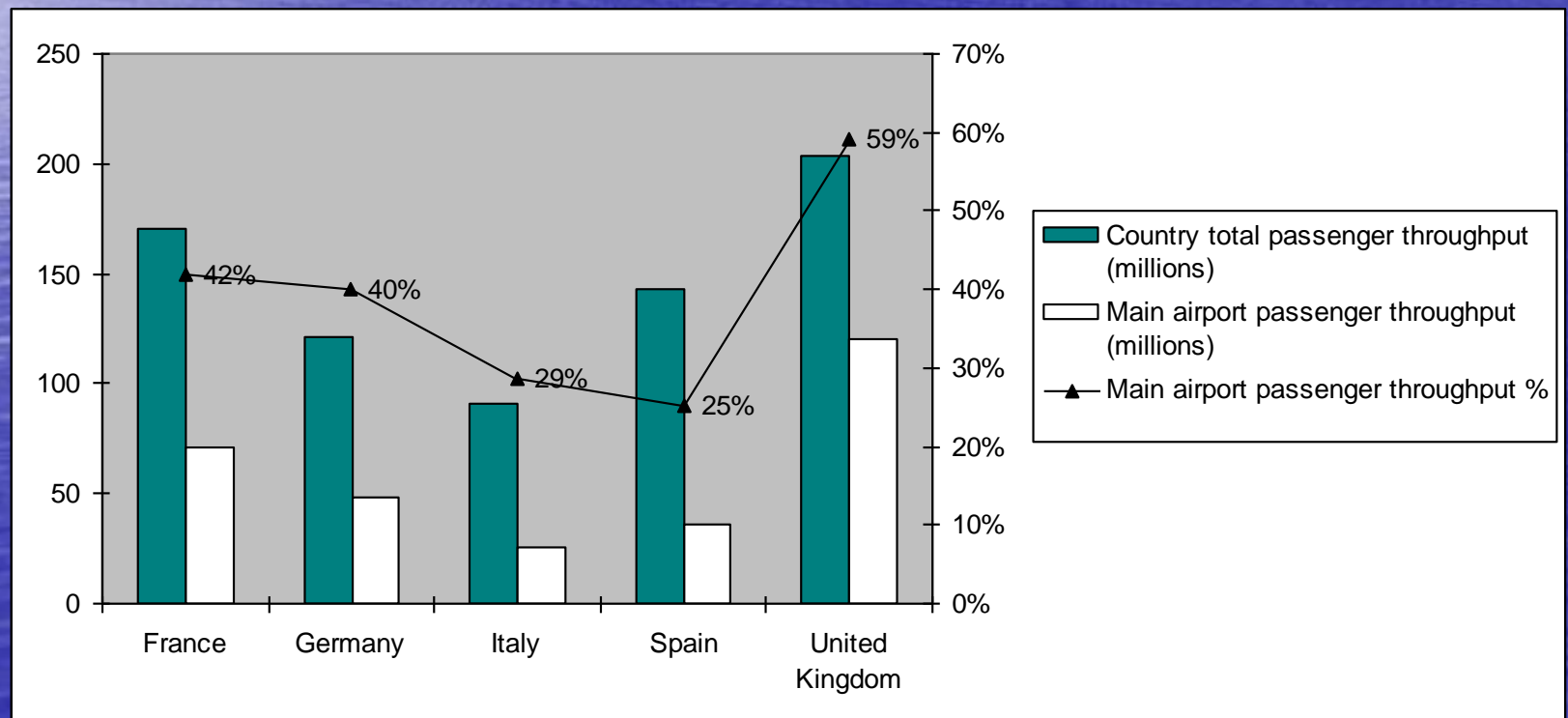


□ London/SE as % of UK Total Pax
■ Other UK Regions as % of UK Pax

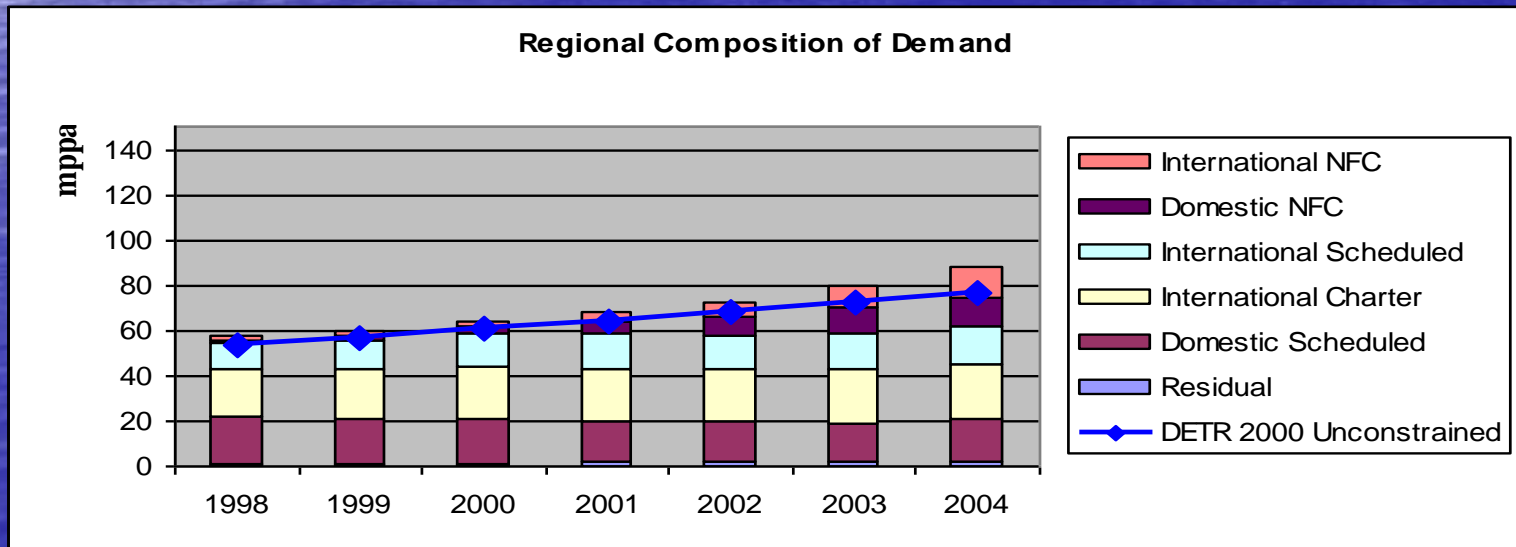
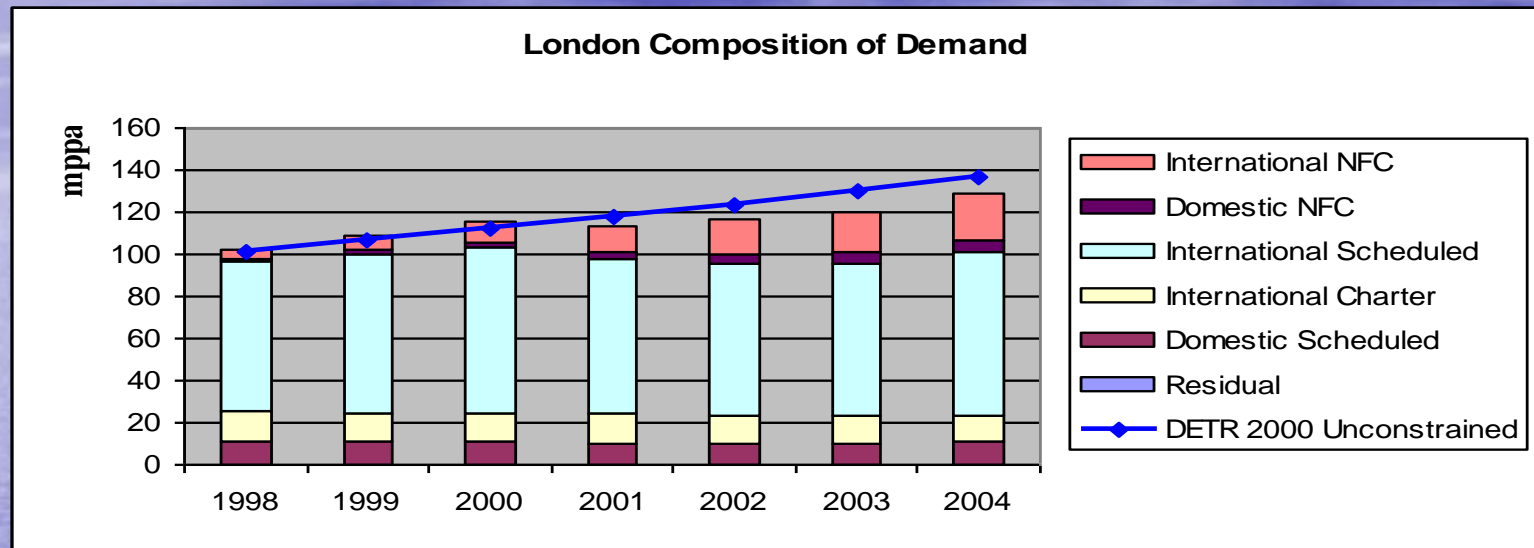
Share of total UK demand originating or with a destination in the regions, has been (and is forecast to continue), rising.

Importance of London System

- Proportion of traffic through dominant city Reliance of London System in U.K. can clearly be seen.
- Still biggest airport – international traffic



Recent Patterns: London vs Rest UK



London Airport System †

Major Airports	Current Demand	Max Use Capacity	Demand Forecast in 2030*	Demand vs Max Use	Capacity Shortfall - Real **
LHR	67m	90-95m	130m	13-18m	63m
LGW	35m	40-45m	80m	5-10m	55m
STN	19m	35-40m	65m	16-21m	46m
Total	121m	165-180m	275m	44-59m	154m

* Assumes no capacity major constraints – SPASM Model for White Paper

** Assumes new runway at each airport, reflecting realistic constraints

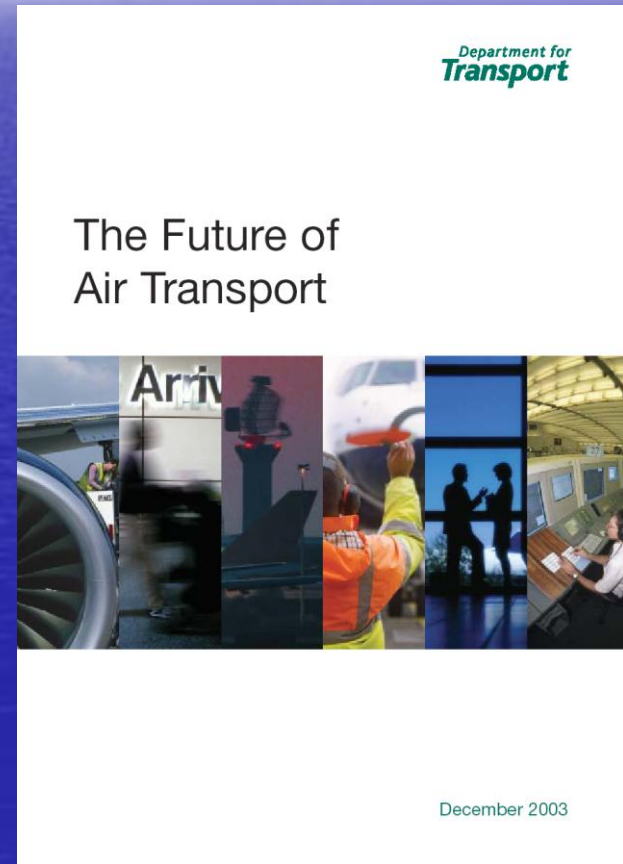
† Luton and London City currently carry 11.5m between them, and would offer 25m by 2030, but for this purpose are considered secondary airports.

Future of the London System

- 2003 White Paper: The Future of Air Transport - first review for 20 years; examined whole UK, but SE capacity was the key political decision
- Large no. of runway/new airport scenarios
- Detailed analysis of runway options at each site
- Very detailed appraisal to prevent legal challenge: Operational, ATC, Financial, Economic, Environmental (noise, air quality, ecology, landscape, heritage, water resources), Ground Transport etc
- Four years work, massive research/modelling programme, huge consultation - 500k replies
- Well received, 7 years life. But politically contentious issue – development not kept pace

The White Paper and Beyond

- Published Dec 2003
- Runways STN then LHR; no new site; develop secondary airports
- Progress Report 2006
- Revised National Forecasts 2009
- Runway decisions rescinded 2010
- New policy 2011



Current UK Policy Position

- New forecasts and strength of climate change issue in Europe raised major questions over R3 at LHR. Environmental report reviewed in Court
- New runways in London was touchstone issue for new Coalition's 'liberal' supporters
- Coalition agreement cancels White Paper policy for London and South East. No new runways.
- Working Group set up to look at Max Use Scenario – more use of runways, non-essential flights banned, High Speed Rail, secondary airports, regulation to reduce interline/frequencies/price off demand, bigger delays

Secondary Airports Serving London and the South East

Airport	Travel Time to London	Current Pax - 2009	Potential Pax - 2030
Luton	45min – 1hr 15m	9.20	15.0-18.0
London City	30min – 45min	2.50	5.0-8.0
Southampton	1hr 15 – 1hr 30	1.90	5.0-6.0
Kent International	1hr 30 – 2hrs	0.02	3.0-4.5
Southend	40 min – 1hr 20	0.05	2.0-3.0
Oxford	1hr 15 – 1hr 45	0.01	0.5-1.0
Total		13.67	30.5-40.5

Could contribute 25% of potential capacity shortfall in 2030; rail/air +demand pricing likely other tools

Secondary Airports: London/South East

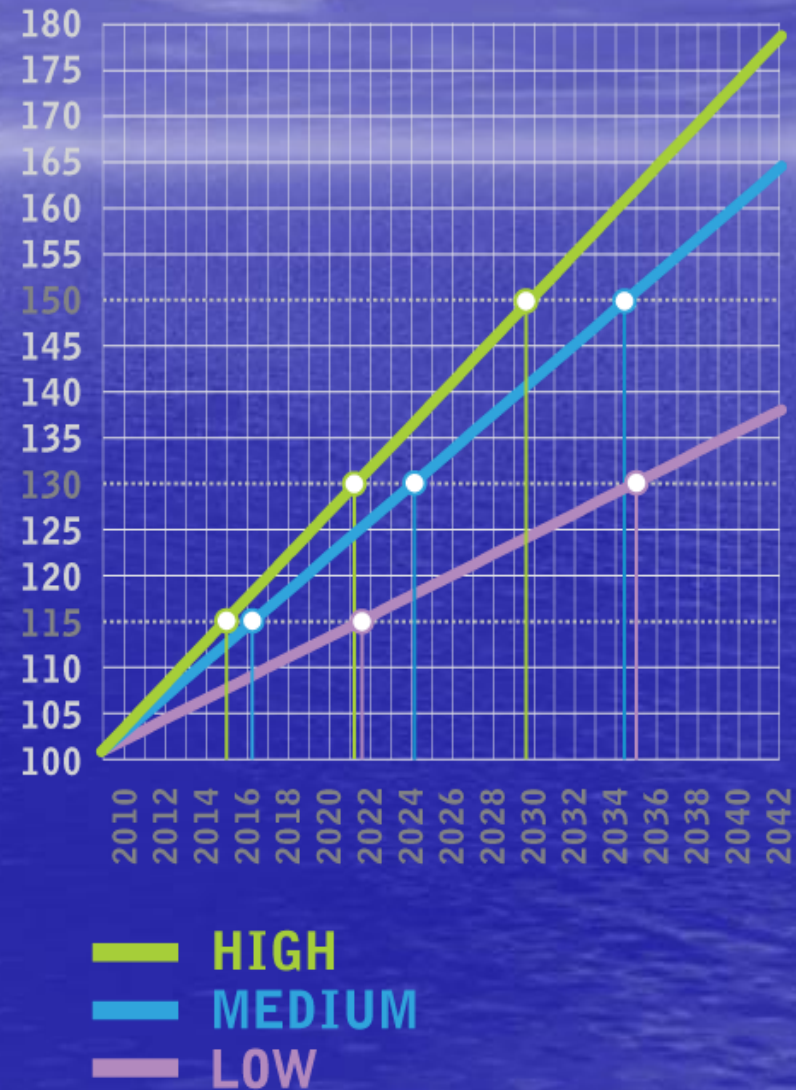
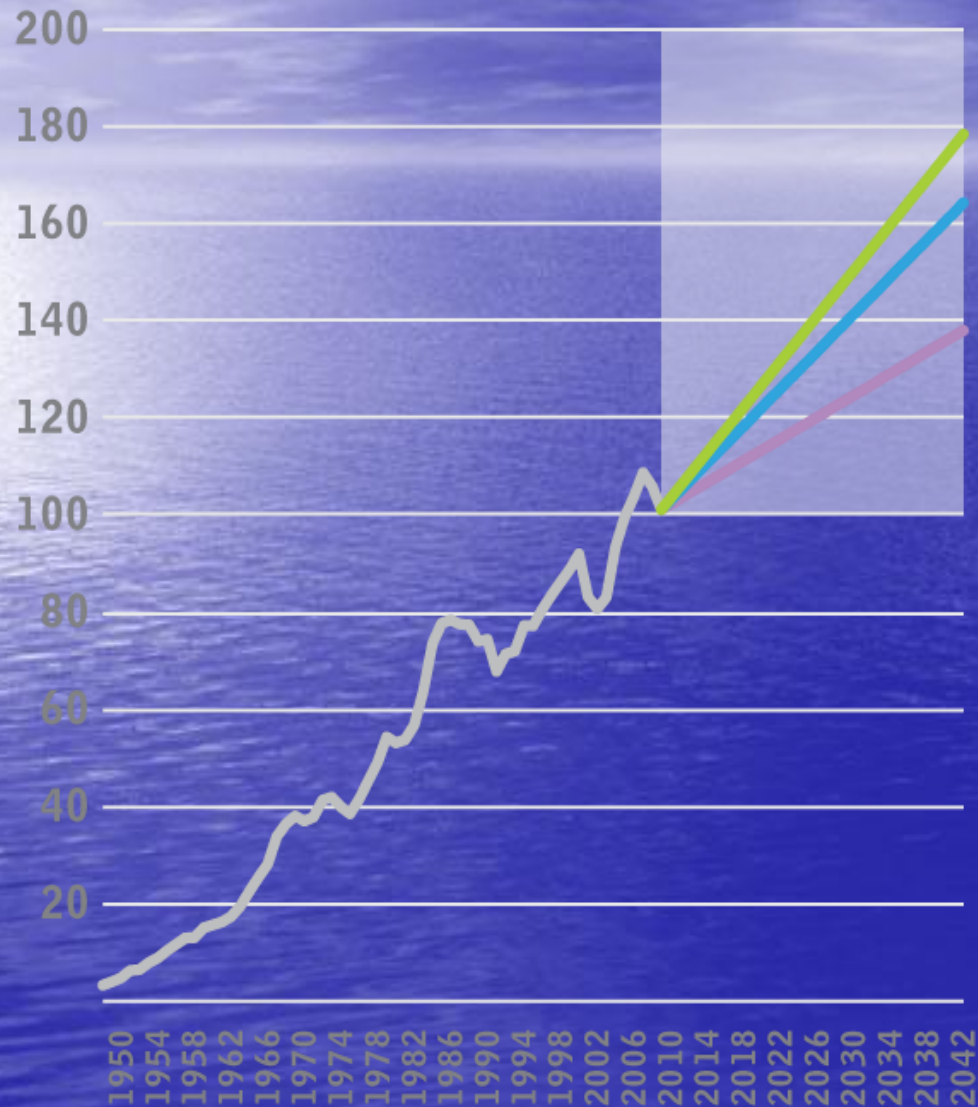
Airport	Bus Av Now	Bus Av Future	Potential Freight	Other Roles
Luton	Good c10k ATMs	Modest – Lost to Commercial	Small	MRO
London City	Good +10k ATMs	Remain same – ATM Limits	None	None
Southampton	Minor	Very Minor	Very Minor Bellyhold	None
Kent International	Very Minor	Minor	Very Significant	GA, MRO
Southend	Modest	Significant	Small	GA, MRO
Oxford	Modest	Significant	None	GA
Biggin Hill, Farnborough	Good	Significant	None	GA

European Response

- Paris
- Frankfurt
- Berlin
- Amsterdam
- Rail Air Switch
- Twin close parallels at CDG; new site search
- New runway, FKT Hahn, DBE
- New Airport and retain secondary
- New runway for environmental relief only
- HSR is major focus for EU

Build new capacity rather than maximise use or price off demand!

RPA's New York Demand Projections



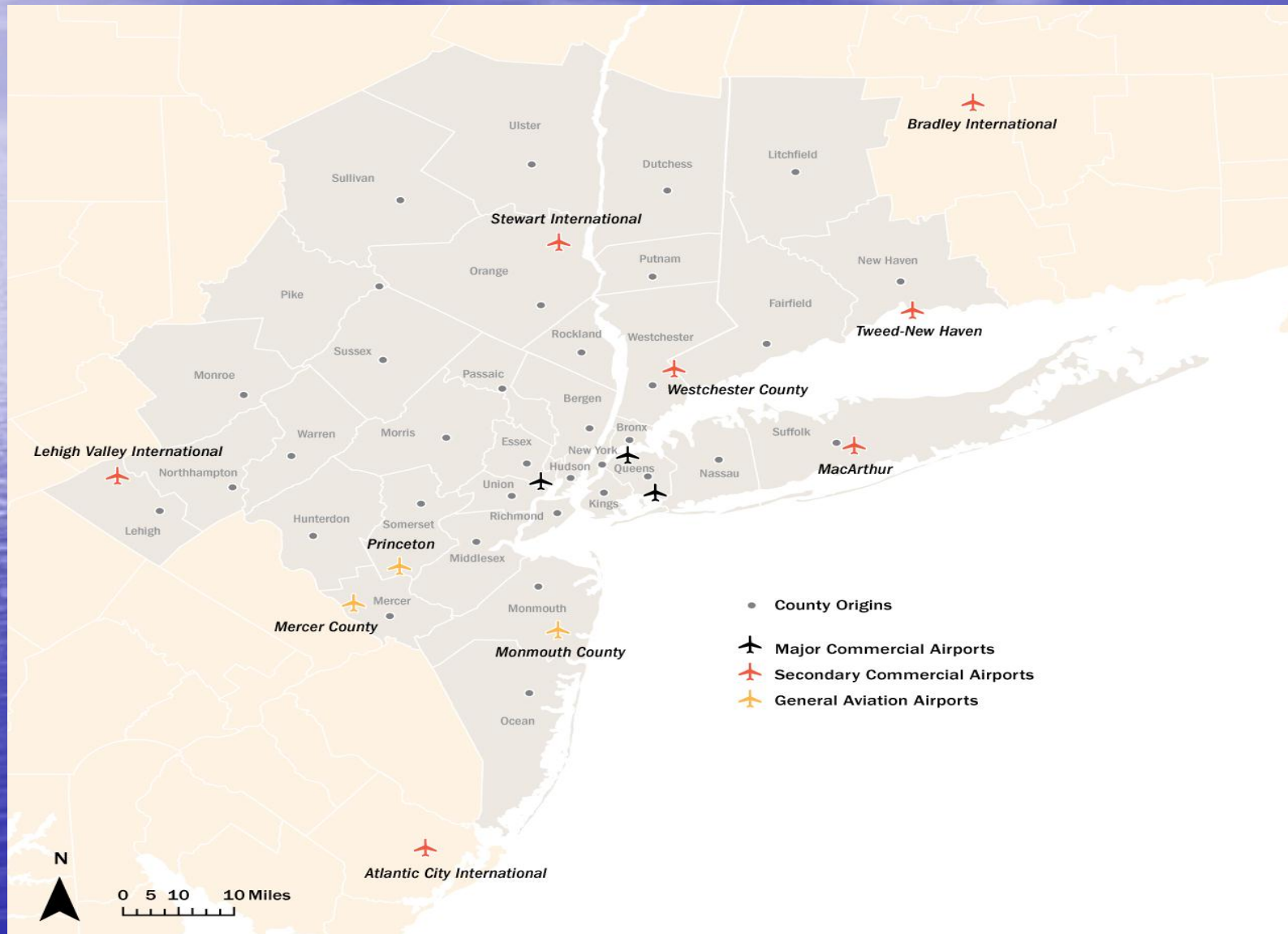
Expected Runway /Airspace Capacity Shortfall with Two Delay Standard

Average Delay	Capacity Shortfall			
	Current	115MAP	130MAP	150MAP
20	233	17	40	68
10	--	39	66	95

New York: Capacity Solutions

- ATC – Gate to gate, runway optimisation, spacing, stacking
- Infrastructure – Runways JFK or EWR? Taxiways, holds?
- Terminal/stand capacity (eg large aircraft)
- Rail air substitution on Boston and Washington corridors
- Secondary Airport development
- Regulation – pricing, restricting types or frequency of traffic

New York Area Airports

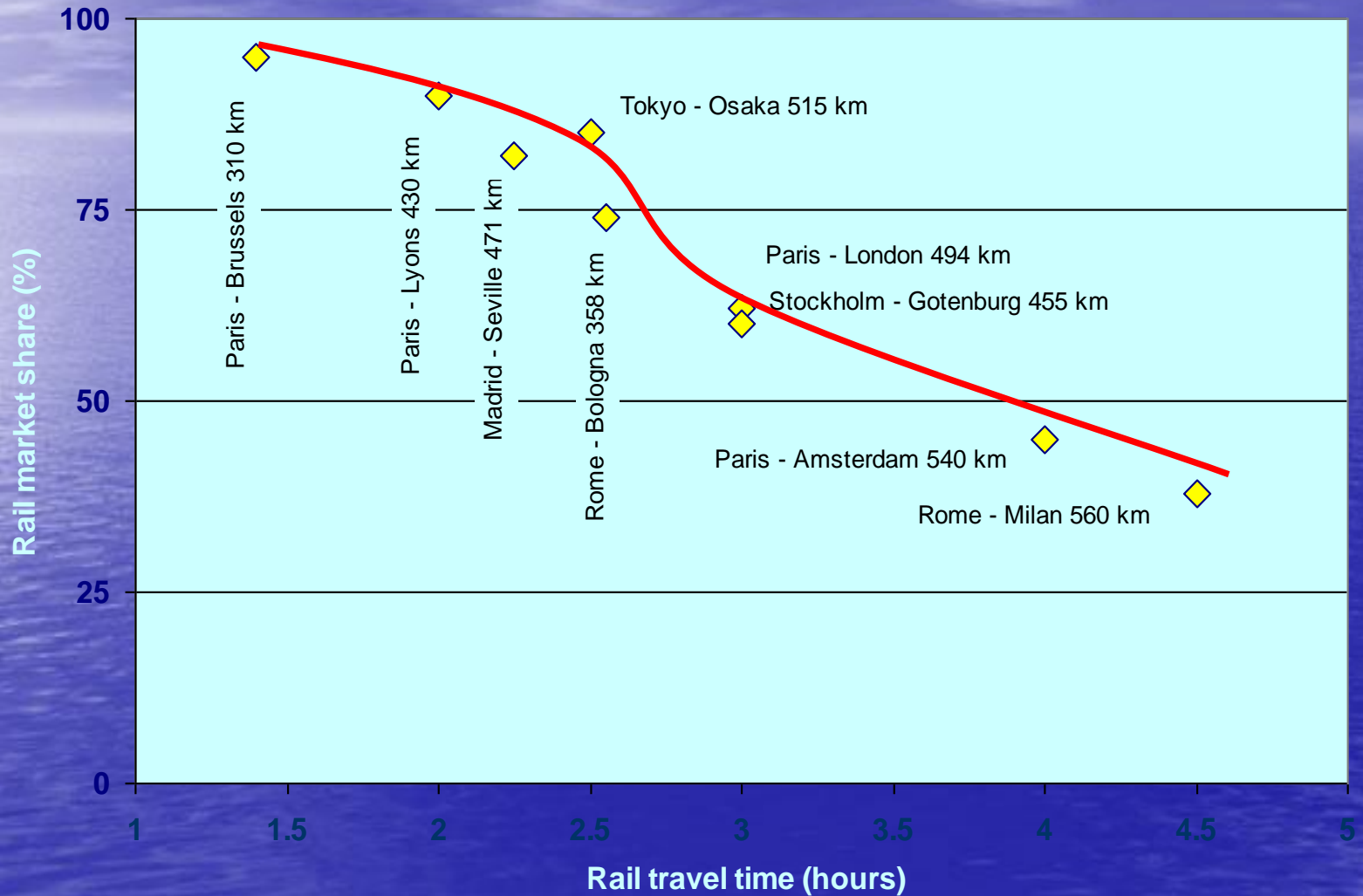


Rail Air Substitution

- Works for surface journeys up to 3hrs on dense markets between major cities
- In EU and UK, HSR is at 140-200mph, limited or none stop, on dedicated track
- Optimal for low price leisure market; elasticity lower on business market
- Substitution 30-90%
- Where no air competition prices rise steeply

Curve of the rail / air modal split

(distances between 300 and 600 km)



Value of Secondary Airports

- Use existing airport assets more efficiently
- Provide core network of destinations locally in geographically large cities with significant traffic congestion reduces journey times and road/rail building
- Maintains indirect price competition
- Infrastructure investment at large airports, is lumpy, costly and much of the capacity is provided ahead of when it is required.
- Current economic climate makes large public funding bond issues – expensive/difficult; smaller ones easier or greater appetite from private equity
- Aircraft charges are higher % of total revenue at larger airports; secondary airports, downside risks lower and easier to draw on/develop diverse income streams
- Mitigates environmental impacts at large airports
- Good models: New England, LA, London, EU capitals

Potential Secondary Airports and Their contribution TBA

London

- Luton, London City, Southampton, Kent International and others
- More regional claw-back beyond South East boundaries
- Take 30-40m pax, plus secondary users

New York

- New York State
 - Stewart, Newburgh
 - Long Is MacArthur
 - Westchester County
- New Jersey
 - Trenton
 - Teterboro
- Take 15-20m pax and secondary users ?

Tests for Good Secondary Airports

Location Criteria

- +2000m Runway
- Decent population catchment/inbound traffic
- Good mix of business and leisure traffic
- Good road access; public transport by bus/rail
- Fast rail alternative difficult to serve markets
- Scope for related real estate development
- Government or local support
- Limited environmental impacts

Management/Finance

- Maximise use of existing assets; targeted and incremental capital outlay
- Reduced service standards (IATA C or D, not A or B)
- Heavy downward pressure/control of Ops Costs/pax
- Mix of low cost, commuter turbo-prop, GA, freight
- Reach +1m pax quickly
- Max diversification of aero, non-aero and property revenue streams
- Minimise processing times; manage dwell times

Conclusions

- If rule out a new site and want growth, strategy probably needs a mix of tools – flexible and reduces risk
- Timing and priority given depends on cost, extent chasing hub traffic, value vs outputs, environmental issues and appetite for regulation
- Need to maintain competition, but frequency caps, route prioritisation?
- ATC – yes, but certainty of technology and outcomes?
- Rail/air can work in the right conditions, but what are the capacity offsets?
- Runways work, but expensive/disruptive
- Secondary airports could contribute but will the market respond and where is investment best made?
- Good appraisal and thorough consultation precursor to 'courageous' politicians and executives