# ATFM
## Planning in Complex Operations

ICAO ATFM GLOBAL SYMPOSIUM
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NATS
Future ATM

# ATFM Planning in Complex Operations

## Content

- Overview of UK Airspace
- Background
- Scale of the problem facing the industry
- Changing our focus from reactive to planned
- NATS Airspace Capacity Management
- New Developments
- Case Study-London 2012 Olympics
- Questions

# ATFM Planning in Complex Operations - Airspace Introduction

# ATFM Planning in Complex Operations

- Air Traffic in the UK and across Europe is growing significantly with demand already exceeding peak traffic levels last seen in 2008.
- In the UK new records were achieved during summer 2017 in both NATS ACCs and in our Oceanic Operation, as well as at several UK Airports.
- Record traffic was also achieved in the European Network as a whole.
- Meeting this increasing level of demand through traditional incremental airspace and infrastructure improvements is increasingly difficult, expensive and forecasts indicate significant disruption to airspace users if a radical change in ATM is not embraced by all stakeholders, aligned with future SESAR concepts.
- Airspace Capacity Management is an integral element of future ATM operations to manage the anticipated traffic levels through future European Reference Periods, with RP3 (2020-2024) being potentially most challenging as operations move from the current tactical and reactive management of demand to highly planned trajectory based operations.
- This move to highly planned operations is both essential and is the key to a successful European ATM operation utilising data rich accurate forecasts to meet demand, with plans being refined over several months to the day of operation to ensure demand and capacity are matched to optimal levels.
- Concepts associated with introducing more highly planned ATM operations apply equally across the globe with all ANSPs facing similar issues to meet growing customer demand.

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- To understand the scale of the problem facing UK Operations, NATS Analytics teams examined the forecast growth on purely airspace capacity limitations in a “Do Minimum” environment.
- This modelling examined the likely delays to air traffic if demand increased at the anticipated rates forecast but only minimal airspace capacity enhancements and procedures are made to accommodate it.
- Weather and staffing related delays were not included in the analysis.
- Airspace Capacity delay accounts for only 1% of UK total delay. (2016 data)

- The results indicate that by 2030:
  - Demand in excess of 3.2m flights per annum
  - Capacity Delay 4.4m minutes per annum
  - 8000 flight cancellations per annum
  - Average delay per flight increases from 0.1 to 1.73 minutes
  - Average delay per delayed flight increases from 10 to 26.5 minutes
- This estimated performance level is not acceptable to NATS and our Airspace Users
- Focus must be on Airspace and Technology Enhancements and Planning for more efficient ways of working

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- In parallel with technology changes and a large scale airspace development programme in the south east of England, NATS is focussed on developing our ACM capability to allow these highly planned operations to become reality.

- Success requires planning at multiple levels:
  - Regional Network Management (European Network Manager)
  - Sub-Regional Airspace Capacity Management (FAB, ACC or multiple ACC cross border operations)
  - Local Planning ( Airport Operational Plans integrated into one Managed Operation)

- Clearly defined, unambiguous roles and responsibilities need to be established for all stakeholders including airspace users.
- Collaborative Decision Making (CDM) at all levels is essential which is a focus area in the European Network currently in partnership with the Network Manager. (NM)
- NATS ACM team operates at the Sub-Regional level and manages ACM for both UK and Ireland.
- Cross border collaboration to enhance Network operations is also a focus area with the NM.
- Future Sub-Regional operational plans will be developed by ACM and coordinated with the Regional NM, agreed prior to operational day through CDM.

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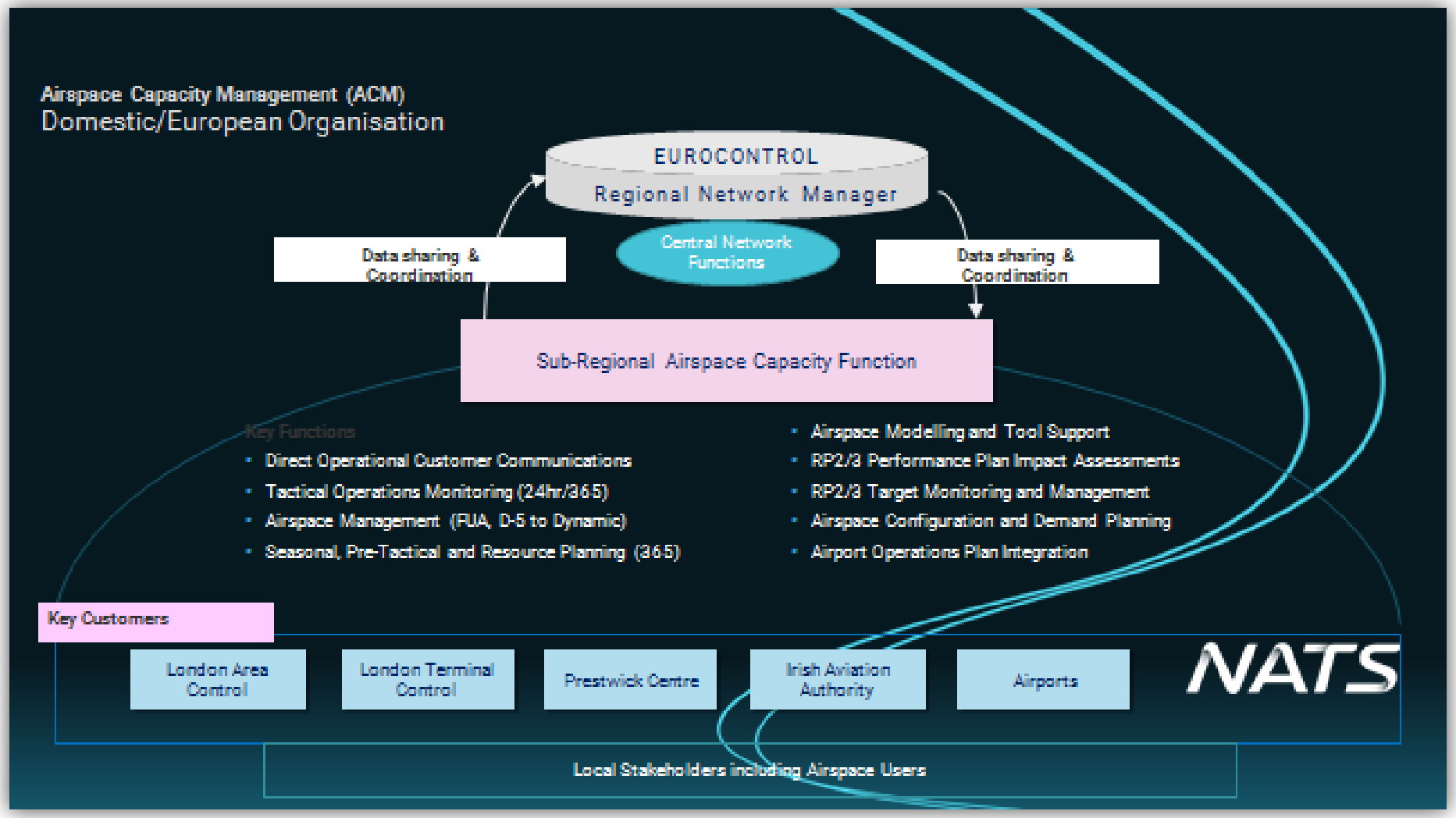

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ACM Team mission:

- To proactively manage, facilitate and develop the most efficient use of the airspace network for the benefit of all our customers.

ACM Team vision:

- To deliver performance based ATFM solutions which meet the needs of our customers whilst enabling our stakeholders to grow more safely, efficiently and with less environmental impact.

- Simple message-complex tasks

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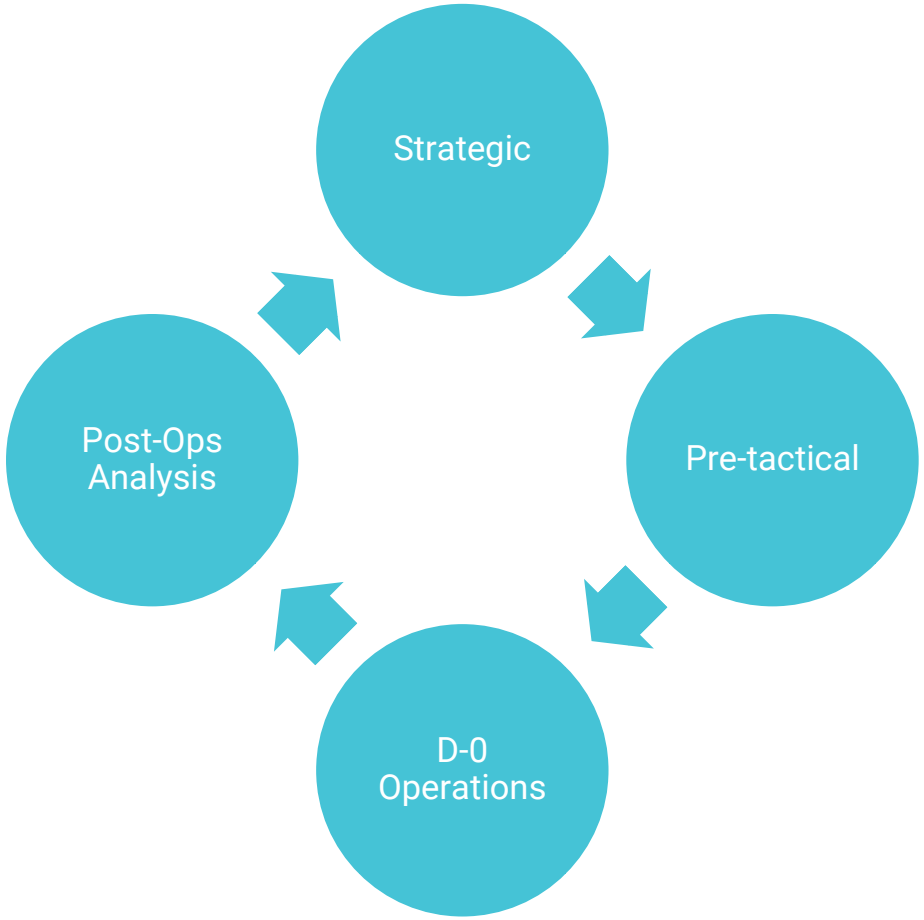
ACM Team Structure Functional Areas:

- Strategic Planning
- Pre-tactical Planning
- Airspace Management Cell
- Route Management
- Tactical Operation
- Post-ops Analysis



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- ACM team established and developed significantly over the last 10 years.
- Integral part of NATS day to day operations
- Focus on improved planning processes as this is recognised for future successful Network Operations
- Operational performance relies on ACM at all stages.
- Development of new technologies and processes is now a  major part of key ACM enhancements

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New Strategic

## Accurately Predicting Future Demand (up to 12 months ahead):

- Use of “Big Data” and data-mining techniques to identify demand
- Embedding Analytics expertise into the Operation to support the understanding of data
- Turning data into intelligence – bring data into the Operation using visualisation products and tools
- Regular collaboration with stakeholders to validate accuracy of demand/data and obtain additional intelligence directly from customers.
- In-depth special event planning involving all stakeholders to identify significant demand changes
- Combine all intelligence into a “big picture” of demand / capacity / resource from which strategic decisions can be made.

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New
Pre-Tact

Further refinement of demand predictions D-5 to D-1:

- Enhanced Flexible Use of Airspace (FUA) Capability
- UK Met Office 7-Day North Atlantic Forecasts enhanced
- Embedded dedicated Meteorological forecaster within Operations
- End-to-end planning and rolling plan more advanced than ever

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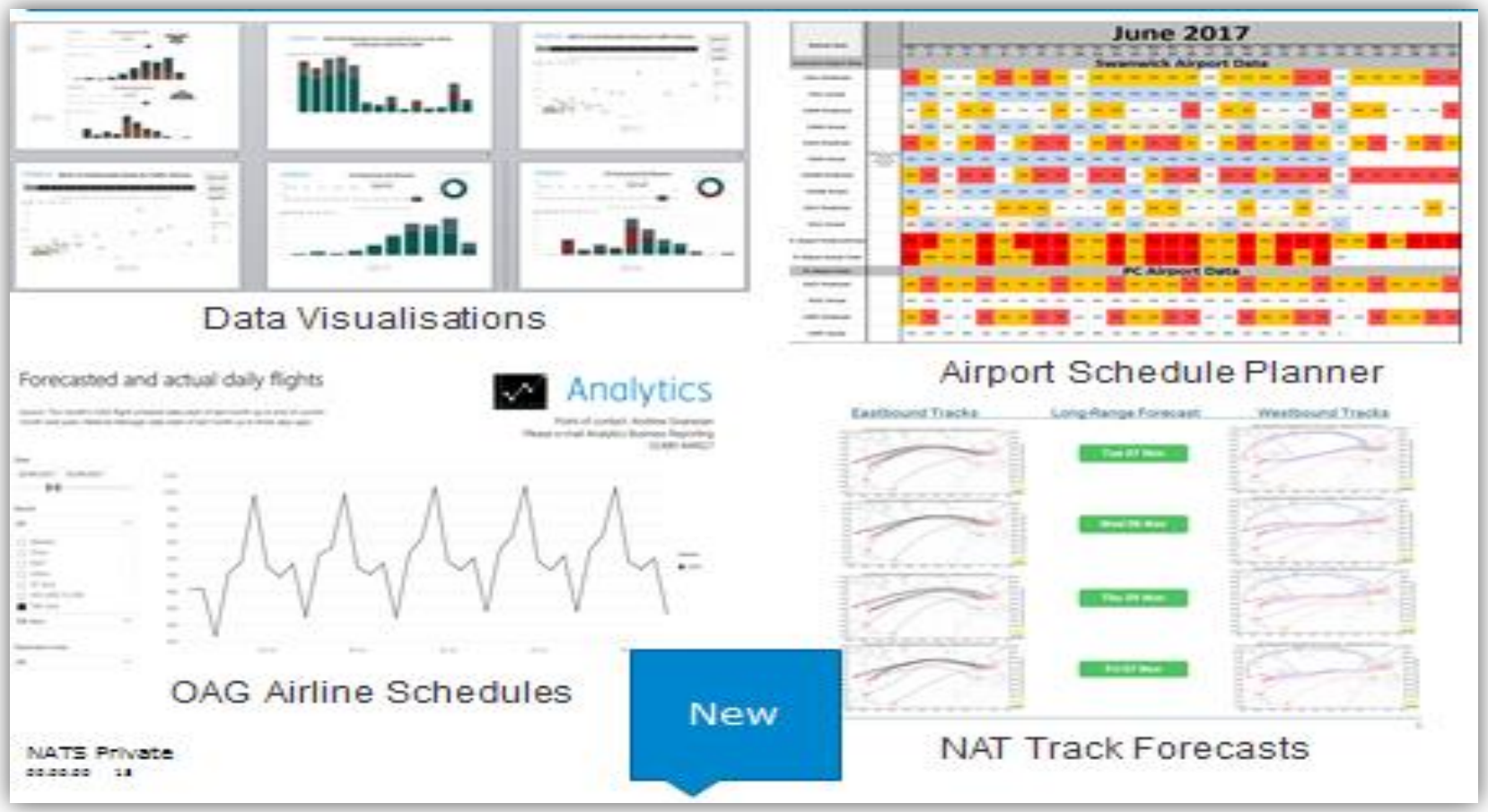
- Visualisation-Making it real



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## Customer and Stakeholder Engagement

New Communications

- Monthly Customer Telecons to brief on operations 30-days ahead
- Monthly Airline/Airport/GA Telecons to understand individual stakeholder issues
- Visibility of the daily plan via NATS Pre-Tactical Brief product
- Extended-range daily briefings across the North Atlantic – NSR
- Individual special and weather event planning telecons
- Publication of information via Network Manager NOP to improve wider Network operational understanding.
- Enhancing customer communications via a dedicated comms cell “OCIG“
- Briefings to operational teams to support understanding and create the best and agreed plan
- Regular collaboration with industry stakeholders to identify key issues, share experience and best-practice via NAMEUR Task Force / NM Axis meetings & FMP Exchange / NM ODSG / NETOPS / RMG /NDOP

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New
Post Ops

Understanding performance of the operation and lessons-learnt:

- Daily operational logging with “smart-search” capabilities to aid decision-making
- Regular daily/weekly/monthly post-ops review meetings to identify best-practices
- Post-Ops Dashboards to improve understanding of NATS service performance metrics
- Heightened awareness of current performance against regulatory targets
- Seasonal meetings to review operations and identify lessons-learnt

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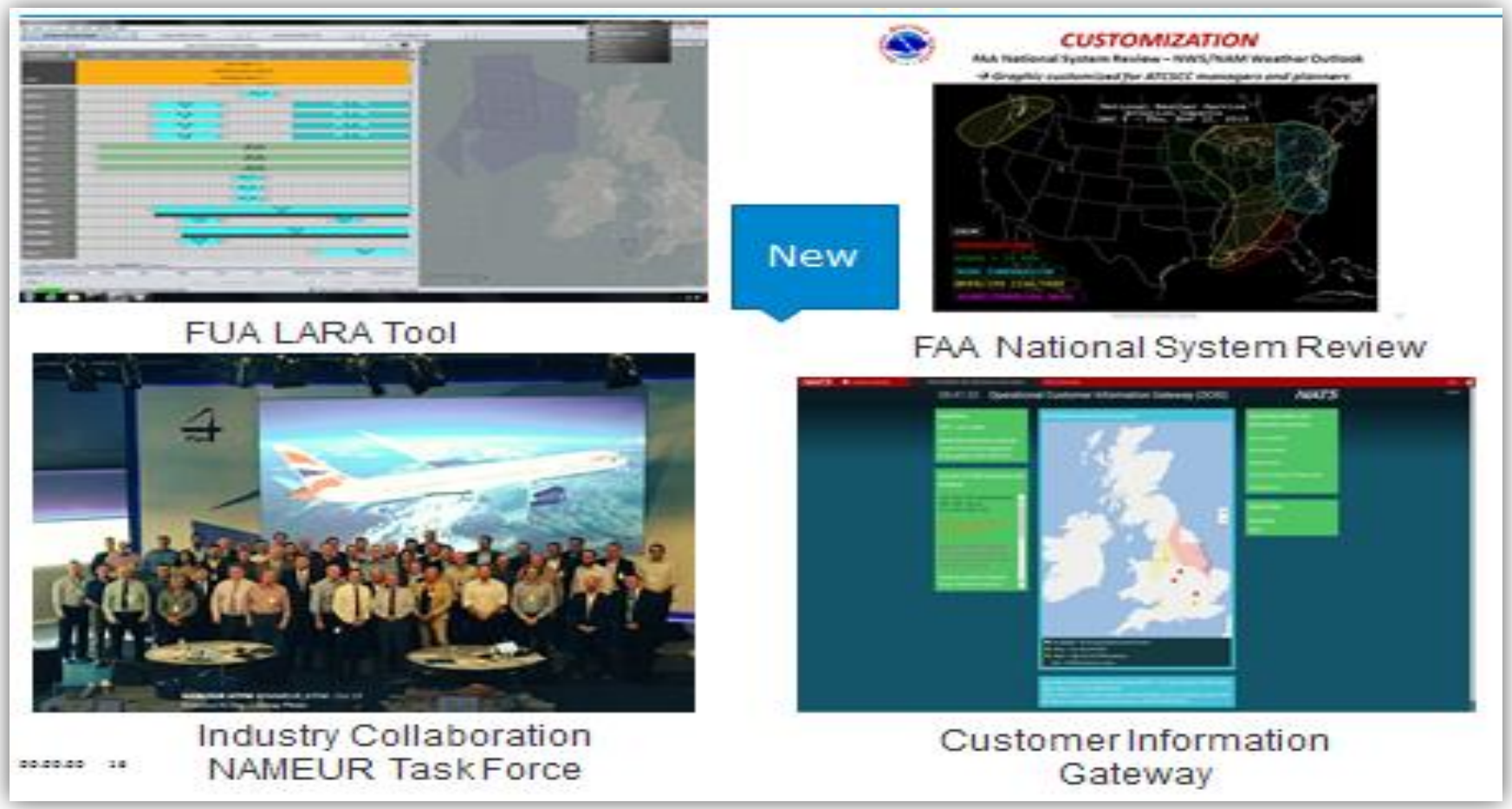

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- Enhanced planning is key to the success of future ATM across all operations.
- This is now recognised across European Network.
- Collaboration led by the European NM is taking forward other new initiatives including:
  - Detailed Transition Planning for Major Project Implementation
  - Delay Optimisation Task Force
  - Flight Plan and Flight Data Evolution Task Force
- NATS actively participates in enhanced planning initiatives because experience demonstrates it can deliver outstanding performance results.

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## London Olympics 2012

- NATS had to prepare to accommodate:
- Half a million overseas spectators
- 70,000 overseas ‘Olympics Family’ members
- 150 Heads of State flights
- 700 extra commercial flights into London’s main airports
- 10,000 business jet bookings.

All within one of the most complex Terminal Control Areas in the world

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The UK and European Network faced the risk of significant ATM delay, particularly during the Opening Ceremony period and the actual Olympic Games

- Security restrictions/flights/interceptions affecting civil use of airspace
- Weather disruption and the ability of network and airfields to recover from disruption.
- Additional demand to 2nd and 3rd tier London airfields and non compliance with slots
- Demand outstripping capacity
- Communications – multiple UK agencies and stakeholders
- Constrained end date!

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- Managing the event required a close working relationship and more than four years of planning with many stakeholders – each with differing requirements
- NATS ACM at the forefront of delivering our world-class success for the games.
- Temporary CAS introduced, capacities modelled and 500 controllers trained.
- Extensive re-route scenarios developed with our neighbouring ANSPs and European NM.
- Compulsory slot booking established for 40 airports in London area
- NATS staff deployed to European NMOC during Olympic period with significant coordination benefits via CDM

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- Outstanding results:
- NATS Swanwick ACC managed 3.5% extra flights for several days during the event, peaking at 4.5% increase on the same period the previous year
- 26 July busiest day with a 59% increase in general aviation and business aviation flights than the previous year
- No risk bearing losses of separation attributed to the NATS during Olympics
- A number of significant weather days including Thunderstorms & LVPs
- The total NATS attributable delay was just 593 minutes 21 July – 15 August with only 72 flights subject to ATC delays and only 2 experiencing delays over 15 minutes
- Planning works!!

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## “Customer Feedback

“NATS’ management of traffic across the entire UK network with delays substantially down versus last year, including special slot coordination across 40 airports without any major incidents and using the NATS coordination and communication cell, has led to a great success for the UK transport industry” **IATA**

“The entire operation was VERY well done, congratulations to everybody involved!!” - **Delta**

“I would like to say on behalf of **United Airlines** how much we really appreciate the work that NATS has done and for the months of planning by NATS and others including CAA and Met Office”

“Just want you to know that we feel the ATICCC updates help our operation immensely by providing improved information for pre tact planning. Please pass on our gratitude and a “high five” for a job well done” – **American**

# ATFM Planning in Complex Operations - Airspace Introduction

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## Questions?

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