

NATS (En Route) plc

RP2 Revised Business Plan (2015-2019)

Revised following Customer Consultation and PRB advice on 27th September 2013 to the Commission on EU-wide performance targets

18th October 2013

The logo for NATS, consisting of the word "NATS" in a bold, sans-serif font. The letter 'A' is stylized with a diagonal slash through it. The logo is positioned at the bottom left of the page, below a decorative graphic of several parallel, wavy magenta lines that sweep across the bottom of the page from left to right.

NATS

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1 Introduction

Martin Rolfe MD NATS Operations

This document sets out NERL's plan for the Single European Sky (SES) Reference Period 2015-2019 (RP2) which we have revised following consultation with customers on the service to be provided and related prices.



Over the last three months, we have benefited hugely from our customers' input. This has provided deeper insights into their requirements and priorities, which have been incorporated into this revised business plan.

Our plan continues to be framed against a background of our current excellent performance. Safety performance is at an all-time high level. Substantial fuel savings have been enabled through more efficient flight profiles. Flight delays have come down to historically low levels where they are no longer of real concern for customers provided this service is delivered consistently.

Recognising that price reduction was a key concern for our customers and regulators, we consulted customers on plans which reduced prices but with differing service offerings. During consultation our customers highlighted the importance of achieving the maximum possible fuel savings, through early implementation of the industry's Future Airspace Strategy (FAS), at the lowest price while maintaining the consistency of service quality that they have become accustomed to in recent years. Therefore, our revised business plan includes the investments and resources to meet these requirements.

With 6.1%¹ pa real unit cost reduction (equivalent to an annual 3.4% real reduction in Determined Costs) our plan goes significantly beyond the 4.6% pa EU-wide unit cost efficiency target proposed in September by the EC's Performance Review Body (PRB). This is measured from a start point that already assumes that we will have reduced our costs by the expected losses in en-route revenues for 2014, compared to the revenues previously forecast in the RP1 National Performance Plan (NPP).

Compared to the NPP (and without adjusting for expected revenue losses), our plan achieves a real underlying unit cost efficiency of 7.8% pa. This is achieved by cumulative cost savings of £390m with an expected 13% growth in traffic over the period. Further, important pension reforms in this plan have avoided costs in RP2 of around £200m. Based on the underlying plan assumptions, headline prices (NERL's component of the UK unit rate) will be 18% lower in real terms by the end of RP2 compared to the end of RP1.

This is an ambitious and credible plan, which we believe reflects our customers' requirements and makes a very significant contribution towards the EU-wide targets for RP2.

¹ The method used by the PRB to calculate the cost efficiency target has changed following their September 2013 publication of Union-wide performance targets. On the basis of the previous calculation method, the RBP showed a 5.7% pa real unit cost reduction, compared to the 6.1% pa it now shows. Please see final section 'Cost Efficiency Calculations' at the end of Section 3 (p9).

2 Executive Summary

Helping our customers...

This business plan is built around our customers' and regulators' priorities for:

- Safety
- Price reduction (to NERL's component of the UK unit rate)
- Maximising fuel savings – through our leading-edge 3Di metric and its link to fuel savings targets, including delivering fuel saving benefits of LAMP and NTCA in RP2
- Consistent service delivery – minimal delay, both en route and airport ATM-related
- Realising Single European Sky objectives, with a major contribution to the European Commission's (EC's) performance scheme.

Our Initial Business Plan was based on two reference point proposals – Plan 1 (service led) and Plan 2 (price led). Airline feedback 'to maximise fuel savings and service quality at the lowest price' has resulted in a Revised Business Plan with the changes described in the diagram opposite.

Against expected recovering traffic in RP2², this plan will broadly deliver our current high quality service, which is an order of magnitude better than any other major European ATC provider, at a much lower price.

It reduces the price at the end of RP2 by 18% in real terms compared to the price at the end of RP1 and delivers a cumulative determined cost saving of £390m over RP2. This is achieved through significant cuts in operating costs – including a c.10% cut in overall manpower with 10% fewer front-line controllers, as well as changes to pay, pensions, working practices and asset management and some assumed cost efficiency savings realised from the UK/Ireland FAB.

A 10% real reduction in planned investment (compared to CP3 levels) is also included which will delay some infrastructure replacement at the expense of an increase of service resilience risk as the current systems age, and also delaying the timeframe at which SESAR 4D trajectory concepts can be fully introduced.

Nevertheless, the plan delivers modernised airspace and systems in line with the Future Airspace Strategy (FAS) which enable us to...

- Further improve on our already high safety performance – with risk per flight reducing year-on-year in proportion to traffic growth
- Achieve a 9% reduction in our per flight CO₂ target by 2019 (vs our 2006 target baseline) which enables airline fuel savings of up to £180m pa by 2019 (vs 2012 baseline). This represents c. 277,000T fuel pa excluding savings in oceanic airspace and aircraft taxi time.
- Reduce the cost of ATFM related delays – through improving the resilience of airports to high winds, while maintaining the existing excellent En Route delay performance
- Meet expected EC key performance targets for safety, delay and flight efficiency at a price that is at the very top of the range of the EC's targets on cost efficiency.

² Source: STATFOR MTF13, published in May 2013

Headline figures

Dimension		REVISED PLAN
Safety ↑ 13% ³	Accident risk per flight ⁴	13% reduction in risk
Price ↓ 18%	Real reduction in cost base end RP2 v end RP1	£102 million (-16%)
	Real price reduction end RP2 v end RP1	-18%
	% DUC reduction pa (efficiency target set by EC) From UK NPP start point less traffic related cost saving	-6.1%
	From UK NPP start point (without such adjustment)	-7.8%
Determined Costs ↓ £80m pa By 2019 v 2012	Cumulative determined cost savings during RP2 v end RP1 in NPP	£390 million
	% DC reduction pa (efficiency target set by EC)	3.4%
	Efficiency saving (operating costs, real v. 2011)	14%
	ATCO manpower reduction	10%
	Non-ATCO manpower reduction	10%
Environment Fuel saving £180m pa By 2019 v 2012 (excl. Oceanic saving)	CO ₂ emissions target ⁵ -10%/flight by 2020 v 2006 baseline, total of En Route, Oceanic and Terminal savings	9% by 2019
	3Di flight efficiency ⁶ (-1pt = £20m pa fuel saving based on spot point estimate)	Score of c.15-17 by 2019 ⁷ Up to c.9 point reduction
Service Delivery Indirect cost saving up to £10m pa By 2019 v 2012	Total En Route ATFM delay all causes (avg. in RP2)	6-12secs
	NERL En Route ATFM delay ⁸	Less than 6 secs
	Daily delay >10,000 min	<5 days per year
	Airport ATFM Arrival delays (mainly weather related)	c.20% reduction
	Service resilience risk	Low Risk
Investment Enables the above	Total RP2 investment (current prices)	£575m
	Contribution to RP2 unit price	£3.70 per service unit
	Real reduction v CP3 annual investment levels	-c.10%

³ The intent of this plan is to maintain the current level of safety alongside the growth in traffic. Traffic is currently forecast to grow by 13% from today's levels to the end of RP2.

⁴ Safety Risk target is a NATS target (not a regulatory target)

⁵ CO₂ Emissions target is a NATS target (not a regulatory target)

⁶ 3Di targets are indicative. The relationship between project based fuel savings and the 3Di metric is complex. Equivalent value of fuel savings may be achieved with a smaller reduction in 3Di score. 3Di target will need to be profiled to reflect project delivery in consultation with CAA and it is assumed that the target will be subject to a dead-band in similar manner to RP1 to reflect the nature of the metric.

⁷ Improvements to data and modelling techniques underpinning 3Di will need to be implemented in the coming years. This will require a re-evaluation of the baseline 3Di performance and the impact of these improvements on the scores in line with standard model maintenance protocols.

⁸ Excludes transition delay, such as LAMP, which will need to be specifically consulted upon with customers/CAA

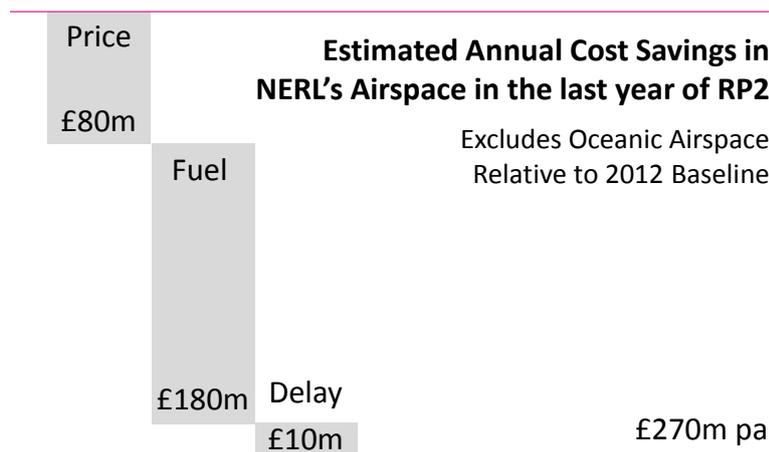
Summary of changes incorporated in the Revised Plan

	Plan 1 Higher	Plan 2 Lower	✖ = Revised Plan relative to Plans 1 & 2
Service Quality	✖		Recognises importance of consistent service quality
Fuel Saving	✖		Recognises importance of fuel savings
Capital Investment		✖	LAMP / NTCA delivery in RP2
Operating Costs		✖	Consistent with delivery of fuel savings and service quality, with some additional efficiency
Non-Regulated Income	✖	Same both Plans	Credible stretch target within market constraints
En Route Price		✖	Significant price reduction reflecting position above
Oceanic Price		Same both Plans	✖ Even lower price - acceleration of COAST to RP1
Traffic	—————>		Updated for STATFOR May forecast

There are a number of areas where NERL has not made changes between its Initial Business Plan and its Revised Business Plan. These are explained in the next section.

Impact of the Plan in reducing Customers' Costs

Estimated annual cost savings in NERL's airspace by 2019 are c. £270m pa as shown below.



3 Feedback from Customer Consultation

3.1 Customer Consultation Process

Customers said they valued the opportunity to engage with NERL through the customer consultation process on its plan. They also said the process and quality of material provided by NERL had been to a high standard. However, customers felt that constraints created by the EU timetable meant that this consultation process had been too short. Also, they would have preferred the CAA's consultant studies to have been carried out earlier to provide an input to the Revised Business Plan.

The Customer Consultation process involved a series of meetings and workshops with a large number of customer representatives over a three and a half month period. These discussions were supported by NERL's Initial Business Plan and a significant amount of supplementary information from the company.

3.2 Main Outcomes of Customer Consultation

This section summarises the main areas of discussion on our Initial Business Plan, as captured in the customer consultation co-chairs' report to the CAA, and outlines the changes we have made in response to the feedback received. In summary, customers want maximum fuel savings and current service resilience at the lowest possible price. While airlines felt that NERL's draft proposed RBP addressed many of their requirements, they stopped short of fully endorsing it pending information from some further studies.

Plan 1 (service led plan) v. Plan 2 (price led plan)

Both initial Plans offered significant cost savings to customers. However, at high level, Plan 1 offered better service quality and fuel savings. In contrast, Plan 2 with its fewer controllers would have lower service resilience in cases of difficult operating conditions, and its fuel savings would be significantly less (c.-45% lower) due to slower delivery of key airspace programmes (LAMP and NTCA) resulting from lower capital expenditure (capex) and fewer people to create the changes needed.

In response, customers placed most emphasis on:

- Maximising fuel savings – through our leading-edge 3Di metric and its link to fuel savings targets, which were the big prize for airlines, in particular delivering the fuel saving benefits of LAMP and NTCA in RP2
- Maintaining the consistency of current service delivery – which was more important than very low average delays
- Driving down price, including operational expenditure (opex) – both headcount and in other areas (pay, pensions and rostering)

Traffic Forecast

The traffic forecast for RP2 is a fundamental planning assumption. Good levels of service are tightly coupled to decisions on operational staffing which in turn are driven by traffic demand. Additionally, price is sensitive to the traffic forecast (as our costs are spread over the forecast number of 'service units').

Customers expressed some confidence in Eurocontrol's STATFOR Medium Term Forecast (May 2013) as an appropriate basis for RP2 ANSP planning, but wanted to discuss directly with STATFOR its forecast methodology and assumptions. The STATFOR May

forecast showed an average annual flight growth in UK airspace of c. 2.4% pa in RP2 with the key driver being projected economic growth.

Customers also asked about the likely range of traffic outcomes and the extent to which NERL's plan could respond. A new 'sensitivity' section is included in Section 5.6 of this plan to show our likely response both to downside risk as well as traffic growth above forecast levels, the analysis of which was also shared with customers through the customer consultation website.

Close alignment of the STATFOR and NERL's own forecasts provided confidence in NERL using the former. We will continue to monitor changes in economic events and produce our own analysis to enable accuracy and assurance checks on the robustness of STATFOR forecasts. We expect to update the CAA on later forecasts in order that it can take into account the best traffic information in setting RP2 prices.

Service Quality and Performance

Safety

Customers were in complete agreement on the paramount need to consistently deliver a safe operation and fully supported NERL's plan for a 13% reduction in accident risk per aircraft (in-line with projected traffic growth) through a combination of investment in technology / airspace and operational safety improvements. Our Revised Business Plan is unchanged on safety and continues to maintain the current levels of safety as traffic increases in RP2.

To aid understanding of NERL's safety plan, customers were provided with additional information on NERL's safety resilience through the customer consultation website.

Environment

Customers confirmed their priority for flight profiles that reduce fuel burn and CO₂ emissions and supported the higher end of fuel saving range of c. £180m pa by 2019 proposed by NERL. They viewed the 3Di flight efficiency metric as the leading measure as it captures flight efficiency in both vertical and horizontal dimensions. They believed this metric is more relevant to airlines than the EU Performance Scheme's horizontal only metric. Customers wanted to work more closely with NERL to obtain assurance that enabled fuel savings translate into actual fuel benefits. NERL confirmed that it would be willing to respond positively to any such request.

Customers also continue to support our strategic target to deliver a 10% reduction in average CO₂ emissions per flight by 2020, including achieving the full benefits of LAMP, NTCA and the flexible use of airspace in RP2. The strategic fuel burn and CO₂ targets were regarded as useful in terms of setting out the business case for specific investments, as it enabled fuel savings to be compared against investment costs.

The debate during the meetings and workshops was supported by further information on the customer website about how fuel savings were modelled, including a profile of the timing and scale of fuel savings benefits through RP2 (an environment 'staircase') and an assessment of LAMP fuel savings benefits by airport. We described the estimated tonnes of fuel savings enabled under our plans, and explained the level of risk (and mitigation) to delivery of LAMP and NTCA in RP2.

This Revised Business Plan now contains the resources required to deliver fuel burn and CO₂ emission reductions at the higher end of the fuel saving range and with a focus on delivering LAMP / NTCA to the earlier timescales contained in Plan 1.

Service Quality

Customers acknowledged that the average delay per flight metric reflected in NERL's Initial Business Plan would be mandated by the EU even though this, and related measures, did not in their view measure service performance that was most relevant to airline operations. Customers believed that their priority for a consistent and predictable service across all flights would be served by an additional measure that captured and incentivised performance against all delay causes, not just those directly controlled by NERL. Customers wanted more challenging delay targets for RP2 than they believed had been set for CP3 and stated that they would be prepared to pay more to incentivise NERL (than the 1% revenue cap) for performance more relevant to airline operations.

The Revised Business Plan now contains the resources required to deliver the customer requirement for service consistency in line with current levels.

Operating Costs

Customers acknowledged that the rate of cost reduction in NERL's plan was at the top end of the PRB's May 2013 target range. Nonetheless, customers questioned (and would look to the CAA consultant studies to test) as to whether further savings could be achieved through best practice in the following areas:

- Further rostering efficiency at centres
- Introduce changes to pay scales which offer better productivity and lower costs
- Leverage further opportunities to reform pensions, albeit recognising NERL's particular legal constraints
- Opportunities working with NERL's FAB partner (the Irish Aviation Authority)

We provided additional information to support the discussion to evidence that the level of operating costs set out in our Initial Business Plan was efficient. DUC reductions in excess of Plan 2 (6% pa) would result in inconsistent service quality that would be unacceptable to customers.

This plan incorporates further rostering efficiency at centres through planned working practice improvements. The company has already adopted stretching pay assumptions in the plan. On pensions, NERL has recently gone through a further round of major reforms to its defined benefit pension scheme, building on the previous round at the end of CP2. From a practical point of view, further reforms to this scheme would come at the price of significant amounts of goodwill with the staff and Trade Unions, which would effectively prevent the planned restructuring and working practice changes and savings that are at the heart of the cost efficiency proposals in the RBP and that require their support. Outside changes to be made voluntarily by the staff and Trade Unions (and which are, additionally, subject to CAAPS Trustee discretion), NERL does not believe any further reforms are legally viable.

There was also debate on the scope for UK centre consolidation (Swanwick and Prestwick) and FAB integration. However, NERL highlighted that it was not possible to deliver the planned cost savings while at the same time further consolidating operations, even if this was achievable politically and socially. We will continue to consider with the IAA opportunities for further improving performance in the longer-term

Capital Investment

Generally, airlines supported the composition of the capital investment plan and the adjustments in timing that NERL proposed in response to airline feedback. In particular, there was strong support for LAMP and NTCA, as they were key drivers of fuel and emissions savings, and also support for ITEC. Therefore, we propose a revised investment plan of £575m. This adds £15m back into our lower initial investment plan

(Plan 2 - £560m) to ensure that the benefits of the LAMP and NTCA airspace programmes can be delivered in RP2.

However, customer support was heavily qualified by the limited time available in customer consultation to review NERL's complex capital investment programme and insufficient information available at detailed business case level.

Customers believed that the adoption of core and development capital expenditure categories could address uncertainties in the ATM environment (e.g. forecast traffic levels) and provide a more helpful approach, while the introduction of triggers could also incentivise NERL with a timely delivery of benefits from its programme. NERL believes that the current regulatory approach provides the flexibility required by customers to modify the investment programme to reflect changing customer priorities and requirements during a reference period. Further, we believe that the company should be incentivised on overall outcomes (e.g. capacity and flight efficiency) rather than on the benefits derived from specific projects. The company further notes that such forms of incentivisation may not be permitted by the EU charging regulation.

Customers indicated their willingness to work with the company to improve their interaction with governance arrangements aimed at providing more assurance in areas they required. We propose an enhanced Service & Investment Plan (SIP) process, which already provides regular customer and regulator oversight. We will consult with the customers directly to establish this new process collaboratively.

Airlines would be looking to the CAA consultant studies to provide assurance including whether the cost of the planned investments were at an efficient level.

Commercial Revenues

Airlines were content with NERL's proposal to respond to their request to maximise sustainable non-regulated income associated with NERL's core activities which contributed to the 'single till'. Further, customers wanted assurance that there was no cross-subsidy between NATS' regulated and non-regulated activities through the CAA consultant studies..

Oceanic Services

Customers agreed with NERL's proposed Oceanic strategy and plan for RP2, including the accelerated replacement of the existing SAATS systems with the GAATS system. This will lead to an additional cost saving in RP2. Customers were also willing to consider in RP2 the costs and benefits (business case) of new service models, including for example new surveillance based control services.

Cost of Capital

For the Initial Business Plan, the CAA requested that we use the CP3 cost of capital as a planning assumption (i.e. 7% pa pre-tax real, before reinvestment of cash). The CAA has now invited us to incorporate into this plan what we consider to be an appropriate rate for RP2. With this in mind, NERL commissioned an independent study by Oxera. Based on their findings (and before any allowance for corporation tax), this plan includes a real vanilla WACC of 5.1% pa that is close to the mid-point of the range proposed by Oxera. This is lower than in CP3 (5.7% pa) reflecting a reduction in the real cost of debt. NERL has projected the allowance for corporation tax required for RP2⁹.

⁹ A higher tax recovery rate is required because assumed regulatory allowances for tax payments (annual average in real prices) in RP2, which are projected to be broadly similar to those assumed in the CP3 settlement, will be recovered over a lower average RAB than assumed for CP3.

When combined with the real vanilla WACC of 5.1% pa this would produce a pre-tax real cost of capital of circa 7%. NERL has incorporated this rate into the RBP.

NERL expects the European Commission and the CAA to commission separate studies on this subject to inform their own decision making for RP2. For this reason, NERL's proposed cost of capital for the draft RBP was not consulted on with customers.

Cost Efficiency Calculations

On 27 September 2013, the PRB provided updated advice in relation to EU-wide performance targets for RP2. This included revised methodology and targets for the level of cost efficiency which States / ANSPs were expected to make over the five year period.

The cost efficiency calculations referred to in this plan (i.e. a **6.1%** pa real reduction in DUC) have been performed using this new methodology, whereas NERL's Initial Business Plan used the previous PRB proposals.

The table below shows, in summary, how the methodology has changed (due to a change in the 2014 start point which is used in the calculation), and calculates the efficiency of this plan using the old methodology (**5.7%** pa real reduction in DUC), as well as the new methodology.

	New Methodology (used in this plan)	Old Methodology (used in the Initial Business Plan)
2014 Start Point (for Cost Efficiency Assessment)	2014 cost base and DUC from the NPP, reduced to reflect expected revenue losses in 2014 (with corresponding cost reduction) from lower than previously forecast traffic	2014 cost base and DUC which would have resulted if the EU-wide target of an annual reduction of 3.5% in the DUC had been applied to NERL in RP1
Determined Unit Cost Reduction	6.1% pa	5.7% pa
Determined Cost Reduction	3.4% pa	3.0% pa

Further detail behind these calculations is provided in Appendices G (new methodology) and L (old methodology).

4 Plan Context

4.1 NERL's Business Today

We currently handle c. 6,500 flights on a typical busy summer's day and some 2.1 million flights pa (previously at a peak of 2.5 million flights pa in 2007). While we manage around 8% of Europe's airspace by volume, 25% of the total flights in Europe enter our airspace making it some of the busiest in the world, made more complex by the UK's position as the gateway for air routes between Europe and North America.

Our three regulated service components cover:

- *En Route ATC services* – in controlled airspace within the London and Scottish Flight Information Regions, together with services outside controlled airspace where required to support commercial operations to regional airfields;
- *London Approach services* – for Heathrow, Gatwick, Stansted, Luton, Northolt and London City airports, provided from Swanwick Terminal Control to ensure that these airports' runways and surrounding airspace are managed in an integrated way;
- *Oceanic services* – control of flights in the Shanwick Oceanic Control Area in partnership with the Irish Aviation Authority (IAA) who provide the communications service. This service is delegated to the UK and Irish Governments by ICAO.

Our operations are consolidated at just two main locations (previously 4 centres):

- *Swanwick* – handling en route air traffic flying over Southern England and Wales (London Area Control) and traffic over London and the south-east below 24,000 feet (London Terminal Control);
- *Prestwick* – handling air traffic in Scotland and in the North/Midlands of England (Scottish Control), and in the North Atlantic (Shanwick Oceanic Control).

The Centres also accommodate military controllers handling military aircraft operating outside controlled airspace, using systems and facilities provided by NERL under contractual arrangements with the UK Ministry of Defence. This "joint and integrated" approach to ATC service provision, with its emphasis on sharing rather than segregating airspace, is a show-case model within Europe for flexible use of airspace and design, as well as offsetting the cost of our services to civilian customers.

To enable our services, we own and operate a nationwide network of communications, navigation and surveillance facilities at around 150 remote sites. Support and training services are consolidated at a single Corporate & Technical Centre (previously spread over 5 sites).

We employ some 3,350 people who operate, maintain and develop the en route ATC system, comprising c. 1,275 controllers, 565 ATC support staff, 850 engineers with the remainder a mix of other disciplines.

We are a partner in the UK-Ireland Functional Airspace Block (FAB) along with the IAA and airspace users (civil and military). The first FAB to be created under SES in 2008, it has been operating successfully to enable significant fuel savings for our customers.

We have developed closer alliances with other ATC providers to pave the way for further cooperative performance improvement. And we are working in the collaborative SES ATM Research (SESAR) programme, leading several of the R&D activities and working collaboratively with other ANSPs (the A6 group) and CANSO to ensure a pan-European solution to ATM modernisation under SES.

4.2 Current Performance

Mindful of the difficulties our customers are facing in the current weak economic environment, we are continuing to help reduce customers' overall operating costs through focusing on fuel savings and punctuality, and through sustainable reductions in our operating costs. We are also delivering major airspace and infrastructure projects to ensure future efficiencies.

Our continued progress in improving the reliability, efficiency and quality of services to customers is evidenced by:

- *Our robust operation* – delivering high safety with very low delay and no major service outages, with 99.9% of flights experiencing no UK ATFM delay due to NERL:
 - > *Safety*: we have now delivered a 57% reduction in safety risk over the last 5 years as measured by our 'weighted SSE' method of assessment;
 - > *Delay*: we have met the delay targets for 2012 set for the RP1 (CP3) regulatory period, the headline T1 average NERL attributable delay being just 1.5 seconds per flight. We also delivered safe, secure and efficient air traffic management throughout the London 2012 Olympic Games, enabling London's skies to remain fully functional and avoiding significant delays to flights;
 - > *Customer priorities*: we have met targets for fuel savings and specific types of delay set under the Operational Partnership Agreement (OPA) with airlines, and completed all "hotspot" projects in 2012 directed at specific customer issues.
- *Reducing the environmental impact of aviation* – enabling significant fuel savings for customers against our target to reduce ATM-related CO₂ by an average of 10% per flight by 2020 (compared with 2006). We have already enabled a 1.8% reduction in ATM CO₂ emissions by September 2013 (including Oceanic and airport ATC savings) which equates to c. 127,000 tonnes of fuel pa, saving £82m pa to airline customers at fuel prices of £650 per metric tonne. This has been achieved through innovation (3Di metric), airspace efficiencies (FAB, flight efficiency partnership and hotspot initiatives) and investment (iFACTS tools and airspace change projects). By the end of CP3 we aim to have enabled a 4% reduction in average ATM CO₂ emissions per flight;
- *Delivering the benefits of investment* – while we adjusted our CP3 capital investment downwards in line with the traffic forecast, we have improved the resilience of our operations through completing strategic renewal programmes (eg radar and voice communications) and have deployed key ATM capabilities (eg iFACTS and EFD) that enable us to improve services to customers and deliver efficiencies. We are also providing for future growth and airspace efficiency through on-going strategic programmes (LAMP, NTCA, ITEC and NCW¹⁰) aligned to SESAR trajectory operations;
- *Continuing to improve the efficiency of our operations* – having delivered a c. 33% reduction in underlying operating costs to 2011 since PPP (2001), with a further £20m or 6% reduction in the cost base planned by the end of RP1 (CP3). This cost efficiency activity is supported by further significant pay and pension reforms, notably a pay deal linked to CPI (instead of RPI) and capping pensionable pay rises. We have also priced below the cap established by regulators for 2013 En Route services (by £5m) and for London Approach (by £2.5m) in 2013/14.

However, the scale of the cost savings needed to achieve lower prices in RP2 under this Business Plan requires us to take further action now to cut our cost base. In this respect,

¹⁰ LAMP – London Airspace Management Programme, NTCA – Northern Terminal Control Airspace (programme); ITEC advanced flight data processing system; and NCW – new common workstation (in conjunction with ITEC)

there are likely to be material restructuring costs incurred in RP1 to achieve EU cost efficiency targets in RP2.

4.3 Traffic Forecast

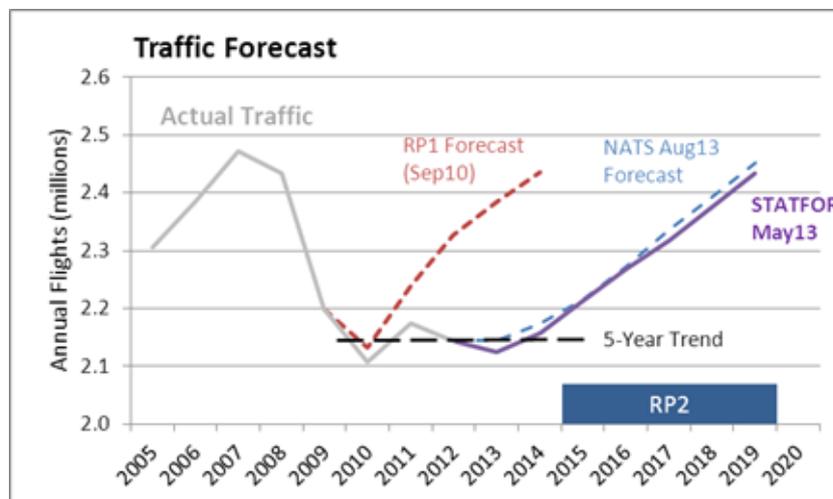
The traffic forecast underpinning this plan is Eurocontrol's STATFOR Medium Term Forecast 2013 (known as MTF13) which is an independent source to be used for planning under EC SES rules.

This plan has been updated for the STATFOR MTF13 published in May 2013 (the Initial Business Plan used the March 2013 version) and to our latest RP2 forecast (August 2013) for comparison. The close alignment of the STATFOR and NATS forecasts provides confidence in using STATFOR as a reference for the traffic outlook that underpins the Plan.

The STATFOR forecast is influenced by current expectations that, in the near-term, UK and European economic indicators remain weak and airline operators will maintain a cautious approach to network expansion. A slight improvement is expected during RP2, though the average annual flight growth (c. 2.4% pa in RP2) is below the previous historical trend (ie 2005-07). Flight volumes and SUs are now forecast to reach previous (2007) peak traffic levels only beyond the end of RP2. This is markedly later than Europe as a whole (2017), reflecting the severity of the impact of the financial crisis and slow recovery in the UK.

Uncertainty surrounding the rate and sustainability of economic recovery in the UK and Europe means downside risk exists. The plan's sensitivity to traffic being lower (or higher) than the STATFOR base forecast is set out in Section 5.6.

We will continue to monitor changes in economic events and produce our own analysis to enable accuracy and assurance checks on the robustness of STATFOR forecasts.



4.4 Regulatory Priorities

The EC will set EU-wide top down performance targets for RP2 at the end of 2013. The four key performance areas (KPAs) will be safety, capacity, environment and cost efficiency. Performance plans will be established at FAB level, with targets established either at an EU, FAB or national level consistent with SES legislation.

The performance scheme comprises 'key performance indicators' (KPIs) used for target setting and 'performance indicators' (PIs) to be used for the purpose of performance

monitoring, benchmarking and reviewing. This plan focuses on KPIs, recognising that there is a wider sub-set of PIs within the scheme against which our performance will be measured.

The EC's priority is to secure significant price reductions in RP2, with the EC challenging ANSPs to reduce cost and price significantly at the same time as improving performance across all the other KPAs. The EC has stated that it expects a significant contribution from the major ANSPs to EU-wide cost efficiency for RP2.

In the interim, in September the PRB has published its advice to the EC which includes proposed targets for each of the KPIs. These proposals are shown in the table below.

SES Key Performance Areas (KPAs) for RP2 – PRB Advice September 2013

KPA	Key Performance Indicator (KPI)	
Safety	Effectiveness of safety management in all management objectives in 2019 (Level D)	NEW
	By the end of RP2, application of severity classification scheme based on the Risk Analysis tool (RAT) methodology	NEW
Environment	Horizontal flight efficiency - % track extension (smaller % = high end target):	
	- Using last filed flight plans (4.1% in 2019) - Using radar data for actual trajectory (2.6% in 2019)	NEW
Capacity	En route ATFM delay per flight in UK/IRE FAB – all causes - TOTAL (17 secs)	
Cost Efficiency	Determined Unit Cost for En Route air navigation services – EU-wide - Reduction on average of 4.6% pa	

Our approach to the cost efficiency challenge centres on maintaining best available service standards consistent with lower prices. Key points to note are:

- NERL's business and cost base have features that are different to airlines' business models, which result in relatively few 'pricing model building blocks' within our control for achieving a significant DUC reduction – *explained in Appendix D Economic Regulatory Model for RP2*;
- According to the PRU's independent benchmarking analysis, NERL has a competitive cost of operation on a 'cost per flight hour' basis, being the best amongst the big five ANSPs in 2011. Yet we have the highest unit rate in the EU which is a feature of the service unit pricing model and key financial differences relating to pension costs, return on investment and exchange rates – *explained in Appendix B ANSP Benchmarking*;
- The UK has been more severely hit by lack of traffic growth than others in Europe, with UK service units in 2012 at 2004 levels compared with an average 20% increase over the same period across Europe. This relative fall in traffic is important for cost efficiency performance, making 'unit cost' reduction potentially harder for NERL than other European ANSPs, exacerbated by financial differences (above);
- Our position as a key national transport infrastructure provider imposes obligations on us (under our Licence to operate from Government) to fit with UK aviation policy and the EC's SES project, and to guarantee an efficient and sustainable ATM system for the longer-term. Therefore, we have to take decisions on DUC reduction in our 5-year plan mindful of the longer-term implications and our Licence obligations.

4.5 Scope of Plan and Regulatory Methodology

Set against this context, this document now covers NERL's revised proposals for RP2 for the UK's En Route, London Approach and Oceanic services. London Approach is included within the plan but may be subject to separate CAA consultation on the form of economic regulation that will apply in RP2.

While Oceanic Services are not included in the scope of SES, NERL's initial plans are set out in this document.

This plan does not cover RP2 proposals for airport ATM services (referred to as terminal air navigation services – TANS). These will be developed under a separate process.

The CAA has written to NERL setting out the regulatory methodology it should apply in preparing this plan, which is summarised in Appendix D.

Following the RP2 consultation process, the 'Final' National and FAB plans have to be submitted in a pre-defined SES format, the read-across between this Business Plan and the SES format being explained in Appendix F to ensure transparency.

The FAB plan will likely be updated for the latest traffic and inflation information available at the time of their publication.

5 Customer Service Plan

5.1 Basis of Our Plan

The main value of the consultation is a much clearer understanding of customer requirements and priorities which have shaped our plan as set out in this section.

Because we have large fixed cost elements, achieving a price reduction is largely confined to adjusting the manpower and investment building blocks. However, price is relatively insensitive to investment levels, so manpower reductions are proportionally larger and the main driver of lower prices.

Our Revised Business Plan is essentially an intermediate mix of both Plans 1 and 2 to deliver a significant price reduction, but with controller numbers and investment at a level to achieve Plan 1 fuel savings and to underpin service consistency – which are key customer priorities.

5.2 Plan Outcomes

Key outputs of our Business Plan are:

- *Continually Reducing Safety Risk* – a 13% reduction in accident risk per flight during RP2 (in-line with traffic growth), through addressing the main risks to our operation including underlying causal factors, and working with the aviation industry to anticipate and manage risk before it impacts safe operations;
- *Reducing ATM Fuel Inefficiency* – we remain committed to delivering our strategic target to reduce ATM-related CO₂ by an average of 10% per flight (compared with 2006) through the effective use of tools, airspace and procedures. By the end of 2019, we are committed to achieving a 9% reduction in CO₂ per flight enabling airline fuel savings of up to £180m pa (vs 2012 baseline) (277,000T fuel pa excluding oceanic airspace and airport ATC);
- *Capacity Matched to Demand* – adequate staffing levels to operate our services safely, with low average delay due to all causes in the range 6-12 secs per flight, reflecting good resilience to weather and airport related disruptions, all with increasing cost efficiency through technology improvements and working practices that enable 'more with less';
- *Specific Customer Priorities Targeted* – addressing on an on-going basis the specific 'hotspots' agreed jointly via the Operational and Safety Partnership Agreements (OPA and SPA) and the Fuel Efficiency Partnership (FEP);
- *Delivering the Benefits of Investment* – in particular:
 - > New airspace structures to optimise aircraft trajectories, reduce fuel burn and CO₂ emissions, mitigate environmental impacts and support airport capacity;
 - > Optimised network operations in line with Europe, with effective queue management that integrates airport and airspace operations to minimise holding;
 - > Initial implementation (in Prestwick upper airspace) of technology and tools for future trajectory operations and to improve our operational productivity.
- *Closer integration of operations and technology aligned to SES* – through further development of the UK-Ireland FAB and ANSP alliances that accelerate the benefits of SESAR.

These outputs are explained in more detail in Section 6 – Delivering the Plan.

Output Dimension	REVISED PLAN
Accident Risk per flight	13% reduction ¹¹
CO ₂ Emissions Target (-10%/flight by 2020)	9% by 2019
Annual Fuel Saving enabled by 2019 (v. 2012) <i>(excluding oceanic airspace and at airports)</i>	£180m pa (277,000 T pa)
Total ATFM Delay all causes (avg. in RP2) *	6-12 secs
NERL En Route ATFM Delay *	<6 secs
Daily Delay >10,000 min	<5 days per year
Airport ATFM Arrival Delays (mainly weather related)	c.20% reduction
Service Resilience Risk	Low Risk

*Excludes transition delay, such as LAMP, which will need to be specifically consulted upon with customers/CAA

5.3 Plan Inputs

What we need to deliver these outcomes...

Our assumptions on inputs to deliver the plan outcomes are explained below. However, the desired outcomes may be delivered with different combinations of inputs from those indicated. For example, a slightly different mix of manpower reduction from ATCOs/Non-ATCOs could achieve the desired efficiency saving and be managed in RP2 against our actual performance v. service targets.

Manpower

Our predominant controllable operating cost is manpower. We will continue to drive efficiency and productivity across the business in order to deliver a further headline real efficiency saving in RP2 of 14%.

On top of the c. 28% reduction in non-controller staff achieved over the period 2006 to 2014 (CP2/CP3 regulatory periods), we propose a further cut in non-controller staff costs. And while we have historically safeguarded numbers of front-line operational controllers, we now plan to also cut ATCO costs without compromising safety.

Staffing and service consistency

Service quality is a function of our capability to manage traffic demand and network disruptions (eg weather, airport issues). Today there is very little delay to flights as a result of NERL's performance.

We forecast traffic demand as accurately as possible and open (split) and close (combine) sectors to meet that demand with efficient staffing rosters. However, our customer's operation is determined by many variables actually on the day. For example, weather in the UK, Europe, transatlantic or even globally, airport performance and aircraft availability can all change the profiles by a significant margin.

Because we have a wide skill set of staff available, we can 'flex' sector opening and closing where demand varies on the day. The skill set is, however, constrained by controllers having to maintain validations on each individual airspace sector, which limits the extent of our ATC staffing /capacity configuration flexibility.

¹¹ To remain in-line with projected traffic growth (currently forecast to be 13%)

Therefore, we need some headroom to ensure we have the right people in the right place at the right time, and currently have more than the required front-line 'baseline operating' number of controllers. This also enables us to carry out training programmes for the introduction of beneficial technology without resorting to major flow restrictions.

Our system resilience is consistently high, with built-in redundancy and faults fixed seamlessly to ensure that system related delays are minimal. To achieve this we invest significantly to ensure a high level of system availability, backed by a sufficient pool of engineers to respond quickly to system issues.

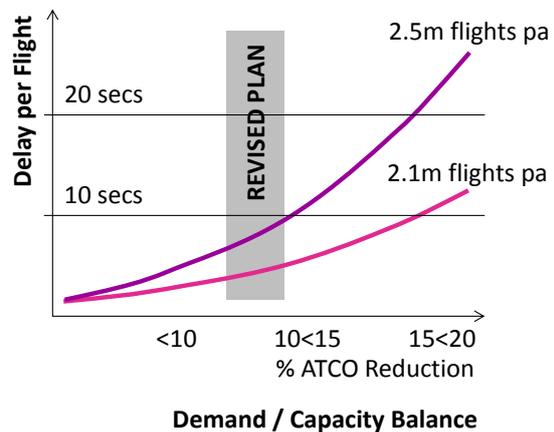
The result is a low level of delay, a record low of 1.5 secs per flight in 2012. There are the occasional bad days, but even in these circumstances we have the ability to resource the problem to mitigate the impact (whether system or operations). The maximum operational delay is c.5,000 minutes on any one day, which we have experienced on just 4 days in the last 3 years (excluding the iFACTS training and transition period in 2011).

We recognise, however, that the impact on our customers is less simple to describe than a single number. For example 3,000 minutes of delay created by London Approach staffing problems at 0700 in the morning has a far wider and deeper impact than 20,000 minutes across the day in our en route sectors. Any early morning problem creates secondary delays for subsequent rotations leading to customers cancelling flights to protect on-time performance. This particularly impacts UK based operators, whereas the en route 'larger' number will be spread across many different customers and more flights thus reducing the individual impacts.

The recognised relationship between delay and the demand / capacity balance has been identified by the EC's Performance Review Body and is illustrated in the diagram below. It shows that for a given level of capacity, the relationship between demand and delay is not linear. When demand is below the airspace capacity, little or no delay is generated. But as the demand / capacity balance is tightened (eg due to staffing reductions) delays can increase exponentially.

As staffing is reduced, more sectors will be operating with a tighter demand / capacity balance, despite compensating productivity changes. Large staff reductions affect our ability to 'flex' capacity in response to staffing shortages, demand variations, weather and airport constraints, with consequential implications for service consistency and airspace delays, and for supporting the introduction of new capabilities.

Against an underlying low level of delay, our network modelling analysis indicates that deep staff cuts and/or increased demand have a disproportionate effect on delays, as shown in the graph. Our ability to manage the demand would become more variable and service quality more inconsistent.



Therefore, we have set staffing levels in this plan in line with the customer priority for service consistency.

Reduced staffing costs in our Plan

We can achieve the Plan Outputs with reduced staffing broadly in line with previously proposed Plan 2 savings, but with a less severe ATCO manpower cost saving in order to safeguard service consistency – a key customer priority.

We will reduce our ATCO resource pool to achieve manpower cost savings equivalent to c.125 FTEs (-10%) – as opposed to c. 185 FTEs (14% reduction) in Plan 2. We will deliver this reduction through:

- Further optimising our working practices, rostering and skill mixes
- Exploiting technology changes;
- Reducing the size of the training pipeline.

We will reduce non-controller manpower costs by 10% – through engineering restructuring in line with new systems being introduced, improved processes for asset and facilities management, and continuing management and back-office efficiencies.

Note that FAB efficiencies are explained in Section 6.2 (Integration with SES) and pay and pensions efficiencies in Section 6.1.4 (Cost Efficiency).

Plan Saving	
Efficiency saving (Real v. 2011)	14%
ATCO Manpower	-10%
Non-ATCO Manpower	-10%
Total Manpower Reduction	-10%

FTE equivalent reduction

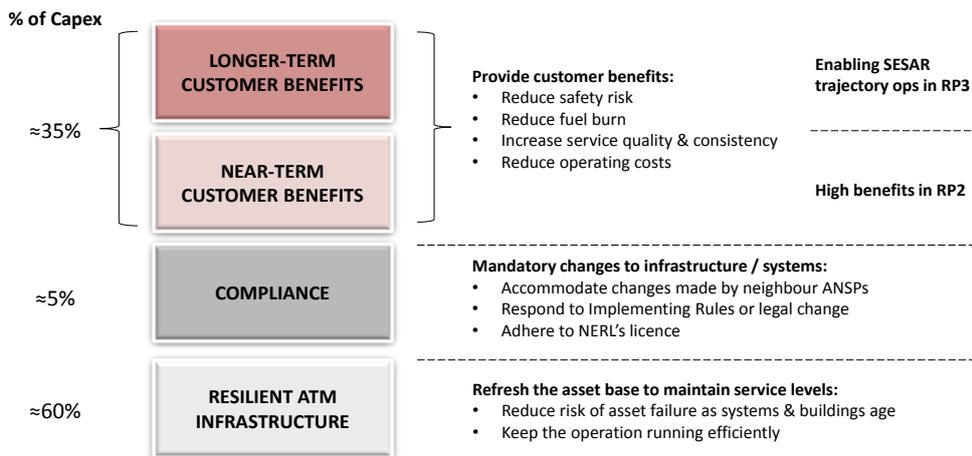
Investment

We need to continue investing to deliver flight efficiency, better resilience and lower costs in RP2, and to be able to realise the longer-term customer benefits of the CAA’s Future Airspace Strategy (FAS) and Single European Sky ATM Research (SESAR) trajectory-based operations.

However, opex and capex are not independent: projects with large training requirements require opex to deliver them, and projects deliver capabilities to reduce opex.

Balanced investment

Our long-term investment plan (LTIP) aims to optimise the balance between asset replacement, service levels (safety, environment and service resilience), efficiency improvements and delivery of future capability.



While asset maintenance and replacement to ensure a resilient ATM infrastructure is the dominant capital spend (c.60%), our approach has been to extend asset life to its maximum limit against business case considerations for replacement (ie tolerable risk to

meeting our Licence obligations, avoiding nugatory spend on ageing systems and reducing our operating costs).

Allocation of the remaining investment (40%) reflects our investment strategy agreed with customers via the annual SIP process, namely to:

- Accelerate projects that reduce operating costs, customer fuel burn and weather resilience
- Invest in network management tools and techniques to increase service consistency
- Meet mandates and implementing rules
- Continue to implement the SESAR 4D trajectory model to able to meet future traffic demand safely, with efficient profiles and at reduced cost – but implemented at a slower rate to reflect current traffic forecasts.

Within this framework, the main investment themes are:

1. *The CAA's future airspace strategy (FAS):* the LAMP and NTCA airspace programmes and performance-based navigation (PBN) to improve flight efficiency and provide structural TMA capacity to improve airport resilience.

2. *Network management:* queue management systems and techniques to reduce airborne holding and ground delay due to route congestion, and further development of FAB / Flexible Use of Airspace (FUA) processes using real-time information to balance network demand / capacity – particularly where mismatches occur due to weather, demand surges and capacity outages.

3. *TMA resilience:* including specific measures to reduce airborne holding, linked into FAS, queue management and implementing Time Based Separation to maintain landing rates during strong headwind conditions.

4. *Centre systems development:* including system software changes to enable 1-3 above, SESAR trajectory tools based on iFACTS, iTEC and NCW, and network infrastructure to support future system-wide information management (SWIM).

5. *Operational productivity and cost efficiency:* supporting operational manpower reductions via advanced controller tools – all enabled by 4 above.

Area	Headline Programmes
Compliance	Navaisds Replacement
Near-Term Customer Benefits	Airspace: Transition Altitude (TA), London Airspace Management Programme (LAMP) and Northern Terminal Control Area (NTCA)
	Queue Management and Time Based Spacing
	Network Management
	Safety & CO ₂ Initiatives (SPA, FEP & OPA)
Longer-Term Customer Benefits	iTEC FDP and New Common Workstation <i>Investment Spans 3 Areas</i> <i>Near Term: advanced controller tools and productivity</i> <i>Longer Term: trajectory operations, operational productivity</i> <i>ATM Infrastructure: new system platforms</i>
Resilient ATM Infrastructure	Surveillance Systems and Data Processing
	Communications and Networks
	NERC & NAS System Builds
	Centre Systems
	Buildings and Site Infrastructure
	Business IT Infrastructure

Our Investment Plan

We propose a revised investment plan of £575m. This adds £15m back into our lower initial investment plan (Plan 2 - £560m) to ensure that the benefits of the LAMP and NTCA airspace programmes can be delivered in RP2.

This level of investment necessitates some further adjustments to our strategy:

- *Resilient ATM Infrastructure*: we will delay some asset sustainment, recognising that this will increase failure rates beyond that we would normally accept, but remaining consistent with our role as a critical national infrastructure business
- *Compliance*: we will avoid replacing some navigation aids (DVORs) subject to CAA agreement of acceptable terms for mitigating the impact of their withdrawal
- *Longer-Term Customer Benefits*: we will reduce spending by delivering iTEC and NCW into Prestwick upper airspace to validate trajectory operations, but slowing down roll-out to other NATS centres subsequently. This will save costs during RP2 at the expense of an increase of service resilience risk as the current systems age, while also delaying the timeframe at which some SESAR concepts can be fully introduced.

NERL has provided supplementary information on its investment strategy to customers and CAA through the customer consultation process, including the costs and benefits of major projects. That material forms supporting documentation for this plan

	Revised Plan
Total RP2 Investment (current prices)	£575m ¹²
Contribution to RP2 unit price	c. £3.70 per service unit
Real Reduction v. CP3 Annual Investment Levels	-c. 10%

5.4 Overall Impact on Customers

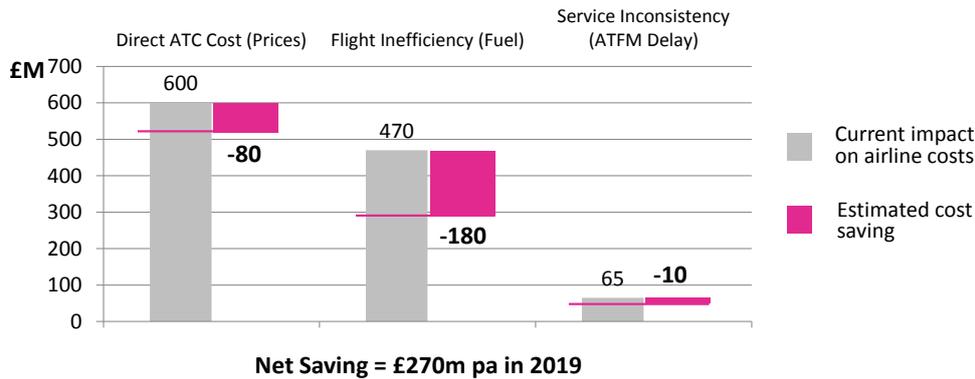
A key goal of SES is to 'reduce the direct and indirect ATM-related costs per unit of aircraft operations'. The chart below shows our estimates of the current (2012) direct and indirect ATM-related costs in NERL's airspace together with the estimated impact of our Business Plan on these costs *in the last year of RP2*.

The cost of 'flight inefficiency' is derived from our joint work with customers on the 3Di metric and subsequent modelling which indicated a £470m pa current cost to customers of inefficient fuel burn in NERL's airspace (excluding Oceanic and at airports). However, the relationship between project based fuel savings and the 3Di metric is complex, and 3Di could never be reduced to zero through NATS actions alone due to factors such as safe airspace design, runway orientation, noise preferential routes and interfaces with adjacent airspace. 'Service inconsistency' delay costs reflect both En Route and airport ATFM delay and are consistent with PRB valuations for the cost of a minutes delay as applied to current performance.

¹² £575m includes capital investment that relates to non-regulated activity. Excluding these activities, capital investment is £547m (see Appendix H).

Impact of the Revised Plan on Airline Costs:

Estimated £M pa Cost Savings in NERL's Airspace *in the last year of RP2*



Further analysis is provided in Appendix C. Section 6.1.3 Capacity Plan explains the role that NERL can play, working with other network partners, to help reduce Airport related delays.

5.5 Alignment with SES RP2 Targets (PRB Advice September 2013)

The SES RP2 performance scheme comprises 'key performance indicators' (KPIs) used for target setting and 'performance indicators' (PIs) to be used for the purpose of performance monitoring, benchmarking and reviewing. This plan focuses on KPIs, recognising that there is a wider sub-set of PIs within the scheme against which our performance will also be measured.

KPA	Key Performance Indicator (KPI)	Revised Plan
Safety	Effectiveness of safety management in all management objectives by 2019 (Level D)	✓
	By the end of RP2, application of severity classification scheme based on the Risk Analysis tool (RAT) methodology	
Environment	Horizontal flight efficiency - % track extension (smaller % = high-end target)	✓
	- Using last filed flight plans (4.1% in 2019)	
	- Using radar data for actual trajectory (2.6% in 2019)	
Capacity	En Route network ATFM delay/flight all causes	✓
	- TOTAL (17 secs)	
Cost Efficiency	DUC for En Route air navigation services - Reduction on average of 4.6% pa	✓

Safety and Capacity Targets

The EU-wide safety targets reflect a relative lack of maturity of many ANSPs' approach to safety management, whereas NERL's approach to safety improvement is consistent with the KPI targets for RP2.

The EU-wide en route delay target includes allowances for severe weather and network disruptions to encourage ANSPs to increase their resilience to such events and make

positive contributions to network performance. The current very low delays in NERL’s airspace (<5 secs per flight ‘all causes’ En Route ATFM delay in 2012) contrasts with a European average En Route ATFM delay in 2012 of 38 seconds per flight¹³. Our proposed outcomes in RP2 are consistent with the SES approach and the PRB’s proposed target (for the UK / IRE FAB) of 17 secs.

Environment – Horizontal Flight Efficiency Targets

Customers supported our view that restricting SES targets to en route horizontal flight efficiency (rather than gate-to-gate including TMA efficiencies) limits the effectiveness of this KPI.

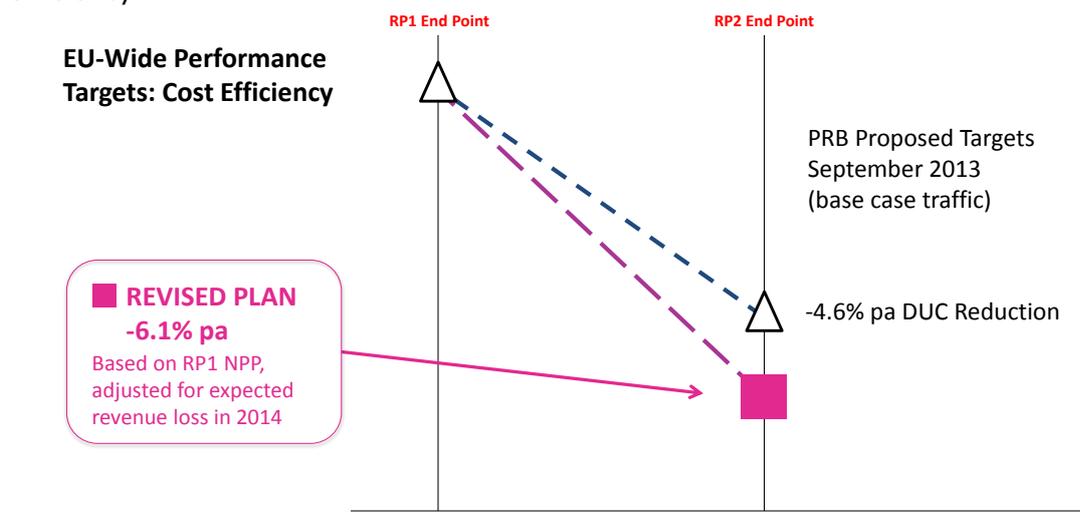
Analysis of our UK airspace network operation shows that the opportunity for reducing en route track extension is small. Based on the PRB’s costs of track extension, delivery of the ‘actual radar data’ target in UK airspace would only enable a fuel burn saving of c.£1m pa by the end of RP2. And given the small opportunity, achieving this reduction would be challenging for us and, in our view, sets the wrong focus for our efforts. Instead, as agreed with customers, our proposed investment plan focuses on improving airspace structures in TMAs and enhancing queue management to deliver more efficient flight profiles and reduce airborne holding. Therefore, we can enable a far more significant fuel burn saving through improved vertical and horizontal profiles in all our airspace (including TMAs) measured via the 3Di metric and project-based fuel savings enabled. The CAA will decide on the relevant environment incentives to be applied in RP2.

Price Reduction Targets

The PRB has published its advice to the EC for en route DUC reduction targets based around the SES high level goal (HLG) to *halve the 2004 unit costs by the time traffic has doubled*, which is 2033 according to the STATFOR MTF13 base forecast.

However, in signing-up for SES, managing a ‘doubling of air traffic’ with the same resources was a key proviso for delivering substantial ‘unit cost’ reductions. Now, under the proposed targets, ANSPs are being asked to deliver the same outcome (cut unit costs by 50%) against a far lower level of traffic, requiring substantial cuts in resources.

The chart shows that our Business Plan will include cost efficiency beyond the RP2 reduction target as proposed by the PRB in September 2013. This is consistent with the CAA’s and EC’s expectation that NERL will make a major contribution to EU-wide cost efficiency.



¹³ Eurocontrol Network Operations Annual Report 2012. In NERL’s airspace in 2012, 37% of delays were due to ATC Capacity, 12% to ATC Staffing and 49% to Weather.

5.6 Plan Sensitivity to Traffic

The STATFOR forecast includes a low case and high case projection of traffic in RP2.

Difference v. Base Case in 2019

STATFOR Forecast	Flights	Service Units
HIGH CASE	+6.7%	+6.3%
LOW CASE	-6.8%	-7.5%

This section describes how we would respond to these scenarios and how this would affect our customers.

Response to Downside Risk (Low Traffic)

Lower than forecast traffic growth would require us to make even more cost savings than assumed in this plan (to offset reductions in revenue), and would mostly affect operational areas of the business. This is due to the relatively fixed nature of NERL's cost base (two thirds relating either to sunk costs or the costs of maintaining the ATC infrastructure).

Key considerations would be:

- The impact of further cost reductions on NERL's ability to meet performance targets in RP2 and for future reference periods
- The additional restructuring costs necessary to realise even further cost savings
- The implications for delivering the benefits of investments required by customers

Under the EU traffic risk sharing mechanism, lower than forecast traffic growth would increase customer prices by up to 2% on average during RP2 (on n+2 basis).

Any potential performance improvement from lower traffic would be largely offset by the further reductions in resources, with service and flight efficiency performance largely unchanged.

Response to Upside Risk (High Traffic)

Higher than forecast traffic would require additional operational resources to maintain service quality. Safety is not jeopardised as traffic flows can be regulated at the expense of ATFM delay. Potential mitigating actions include:

- Greater controller overtime (which is voluntary) over and above base case assumptions to provide some flexibility to handle additional traffic volumes
- Increasing controller numbers, recognising the long lead time for recruitment and training
- Redirecting or reprioritising capital expenditure (via the SIP process) to deal with emerging issues affecting service and flight efficiency caused by higher traffic.

Average prices in RP2 would reduce by up to 2%. ATFM delays would increase by a modest amount, and our ability to achieve flight efficiency targets would be affected.

Implications for Plan Outputs

Traffic	Delay (T1)	3Di Score (end of RP2)	Average Price
HIGH	<8 secs	Likely to be worse than base	c.2% lower
BASE	<6 secs	Score of c.15-17 ¹⁴ (up to c.9 point reduction)	c. £55.71
LOW	<6 secs	Similar to base	c.2% higher

There is an asymmetry in the impact on plan outputs of high traffic caused by the long lead time for increasing controller numbers, whereas our response to low traffic does not have such a major constraint.

¹⁴ Improvements to data and modelling techniques underpinning 3Di will need to be implemented in the coming years. This will require a re-evaluation of the baseline 3Di performance and the impact of these improvements on the scores in line with standard model maintenance protocols.

6 Delivering the Plan

6.1 Service Strategies

This section summarises our core strategies for delivering the Plan.

These strategies reflect the significant evolution in our operations that is taking place:

- The CAA's FAS programme in which we will implement new airspace structures and optimised network operations to reduce CO₂ emissions, mitigate environmental impacts and support airport capacity;
- Increased ATC automation to reduce the labour intensity of our operation;
- A move from tactical controlling to trajectory based management, in line with the SESAR concept for trajectory operations, to optimise aircraft trajectories;
- Closer integration of operations and technology through FABs and ANSP alliances.

Delivering technology, adapting airspace, changing the whole way of operational working and integration with Europe are all major challenges going forward.

6.1.1 Safety

Our core responsibility is to run a safe ATC operation. Our strategic aim is to deliver a 35% reduction in accident risk per flight during the period 2013–2025, which translates into a 13% reduction during RP2¹⁵. This reduction will be achieved through six strategic goals:

1. Measuring safety performance both from things that go wrong (events, safety concerns or lessons learned) and things that go right (good practice);
2. Monitoring the right risks;
3. Optimising our contribution to minimising the risk of an aircraft accident;
4. Designing our operations, airspace and systems to optimise safety benefit;
5. Everyone having a personal responsibility for safety;
6. Achieving the right balance between automation and the human task.

We have a published Strategic Plan for Safety which describes our approach to reducing safety risk in line with our strategic goals. This strategic plan continually evolves to ensure we are achieving our targets, by focusing on safety improvement areas which will address the main risks to our operation including underlying causal factors.

The key elements of our plan in RP2 are:

- *Tactical Safety Improvement*: on-going unit-led safety improvement projects to focus directly on tackling specific sources of our safety events;
- *Strategic Safety Improvement*: safety improvement projects to increase the overall resilience and safety margins in our operation, including developing human performance, airspace and procedure design, and enhancing technology. Relevant investment in RP2 includes:
 - > New Airspace Structures (LAMP & NTCA in particular) – that provide greater resilience against human error (pilot or controller) and reduce the risk of level busts or controlled airspace infringements;
 - > Workstation / Flight Data Processing Capabilities – the new safety nets and tools that are built onto an 'enhanced iFACTS' for trajectory operations.

¹⁵ To remain in-line with projected traffic growth (currently forecast to be 13%)

- *Safety Management Improvement:* to maintain our world leading position and influence within Europe, we will work to influence the European safety regulations, work with international partners to enhance our Safety Management System (SMS) capability and, continue to develop our understanding of safety performance and risk.
- *Working with Others:* we will continue to be engaged with industry through the Safety Partnership Agreement (SPA) which maintains a joint Safety Plan detailing how NATS and customers collaboratively tackle key risk areas.

6.1.2 Environment

Our on-going 'Acting Responsibly' environment programme is focused on minimising the environmental impact of ATM so as to enable the sustainable growth of the aviation industry. NATS was the first ATM organisation in the world to set environmental targets for reducing ATM-related CO₂ (in 2008). We were also the first to develop ways of measuring our performance and the first to include a metric (3Di) in our regulatory framework (in 2012). 3Di extends the existing European horizontal flight efficiency metric to include vertical elements (the difference between the 'actual' and 'ideal' flight profile), and applies only to the UK domestic airspace portion of the flight.

Flight Efficiency Metrics

The SES Performance Scheme for RP2 will use horizontal flight efficiency as a proxy for fuel efficiency in order to incentivise ANSPs to develop optimal route designs, flexible use of airspace and free route airspace during RP2 to achieve targets.

However in our airspace, ignoring the vertical phase and the 'near to airport' phase of flight misses a large potential source of flight efficiency. In our view credit should be given for the contribution of national targets (3Di) to fuel savings on the vertical dimension where significant additional efficiencies are possible.

Therefore, we will propose to continue to use the 3Di metric in RP2 as fuel savings enabled in the vertical dimension are potentially as large as horizontal fuel savings. We believe this is in the over-arching interests of our customers.

However, the relationship between enabled fuel savings measured by ATM CO₂ reduction and changes in the 3Di score is complex (as explained in the box). In practice, customers may realise a level of fuel savings exceeding those captured by 3Di alone.

Therefore, NERL believes it will be important for the CAA to measure our performance against the finally decided flight efficiency target using a combination of improvement in 3Di score and other project based evidence across the full range of airspace that we can influence.

ATM CO₂ Plan

Our ambition is to achieve our strategic target to reduce air traffic related CO₂ by an average 10% per flight by 2020 (from a 2006 baseline). Building on our ambition that we will achieve a 4% per flight reduction by the end of CP3, our RP2 environment plan is based around the following themes:

The 3Di metric and the ATM CO₂ reduction target have a slightly different focus and flight efficiency outcomes measured by each differ:

> 3Di measures day to day performance of airspace efficiency using aircraft tracks and trajectories, but covers only domestic and terminal airspace and therefore does not include other savings in Oceanic airspace or at airports on the ground (taxi time)

> The ATM CO₂ metric underpins NATS strategic 10% fuel and emissions target, based on enabled fuel and emission benefits through investment and changes to operating methods (ie. project related), including savings in Oceanic airspace and at airports.

1. *Reducing CO₂ emissions through airspace and procedure changes:* the major strategic improvement to flight efficiency will come from investment in airspace programmes such as LAMP and NTCA. The new airspace structures they deliver will exploit aircraft abilities to fly precise trajectories, enabling:

- Routes to be located where they best meet the needs of airports and flight profiles;
- Continuous climbs and descents to be flown to/from significantly higher altitudes than today
- Far better use of finite terminal airspace, thereby providing greater opportunities to mitigate environmental impacts.

Efficient trajectories in terminal airspace are especially important as the fuel savings enabled will be significant and noise impacts of increasing traffic minimised. However, changes to Transition Altitude by the CAA (implemented by NATS) are a key enabler for these programmes. We will also continue to make small scale procedural improvements across our airspace network through joint OPA and FEP 'hotspot' initiatives to deliver emissions benefits.

2. *Technology and innovation:* we will deploy new technology and tools that will allow aircraft to fly closer to their optimum route, profile and speed. Key investments and technologies in RP2 include:

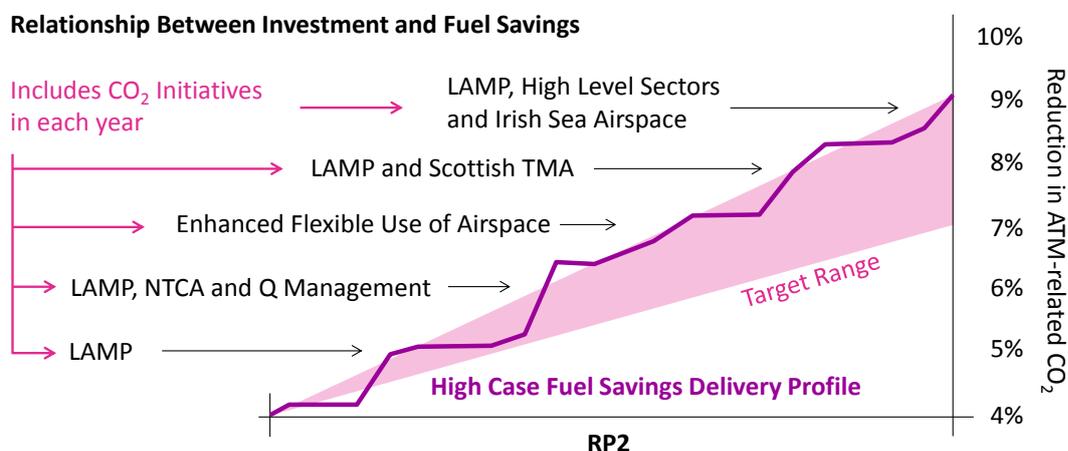
- Advanced flight data processing and multi-sector planning to facilitate optimum routes and profiles across several airspace sectors
- Queue management (arrival and departure management) to achieve efficient traffic sequencing on busy runways, improving flight profiles and eliminating stack holding in normal operations.

3. *Mitigating aircraft noise:* all our major airspace change projects have objectives for limiting and where possible reducing aircraft noise. We also undertake innovative work with airports, airlines and communities to reduce noise, eg the current Heathrow noise respite trials.

4. *Working in partnership:* we will work with airline and airport customers and industry partners to find new and quicker ways of implementing environmental solutions.

5. *Reducing our carbon footprint:* while most CO₂ savings lie in the management of air traffic, we will continue to reduce our impact on the local environment by extending our initiatives to reduce the amount of energy and water we use, the amount of waste that goes to landfill, and the miles we travel.

Environment is therefore a key theme across a number of strategic investment programmes. The relationship between capital investment and fuel savings is illustrated in the chart below. It shows that our fuel saving target will predominantly be delivered by investment in airspace programmes, highlighting the importance of the LAMP and NTCA projects.



6.1.3 Capacity

Given that traffic volumes are not forecast to reach previous (2007) peak levels until beyond 2019, our ATC system has sufficient structural capacity for RP2 in terms of airspace sectors. Our strategy for RP2 is to ensure that this capacity is used efficiently in order to reduce airline costs in terms of price (manpower), fuel burn and delay costs.

There is a need to optimise the capacity of London TMA airspace to ensure resilient airport operations, in particular at Heathrow (which is running close to its movement cap) and at Gatwick. In addition, the LAMP programme aims to optimise the arrival and departure routes to minimise departure delays. Furthermore, we need to be in a position to react effectively to the outcome of the Airports Commission on additional capacity in the south-east.

Against this, the key components of our strategy are:

- *Operational productivity* – smarter working through adjusting working practices and implementing new technology /automation in our operations rooms;
- *Capacity matched to forecast demand* – ensuring that we have adequate staffing levels to operate the service safely and with good resilience to weather and airport disruptions such that delays due to all causes are at an absolute minimum;
- *Optimised airspace and airport throughput* – airspace and procedures using performance based navigation that are optimised for trajectories and ensure safe and efficient airport and network performance, with queue and network management providing an efficient flow of aircraft on busy runways without airborne holding;
- *Effective network management* – continuing to develop network management techniques so that available airspace capacity at local, national and FAB level is used effectively – based on real-time information to balance network demand / capacity, particularly when and where there are mismatches due to weather, demand surges, and capacity outages.

Linkage to En Route Delay Performance

Service quality is a function of NERL's capability to manage demand taking into account staff deployment, the presentation of traffic and weather amongst other factors.

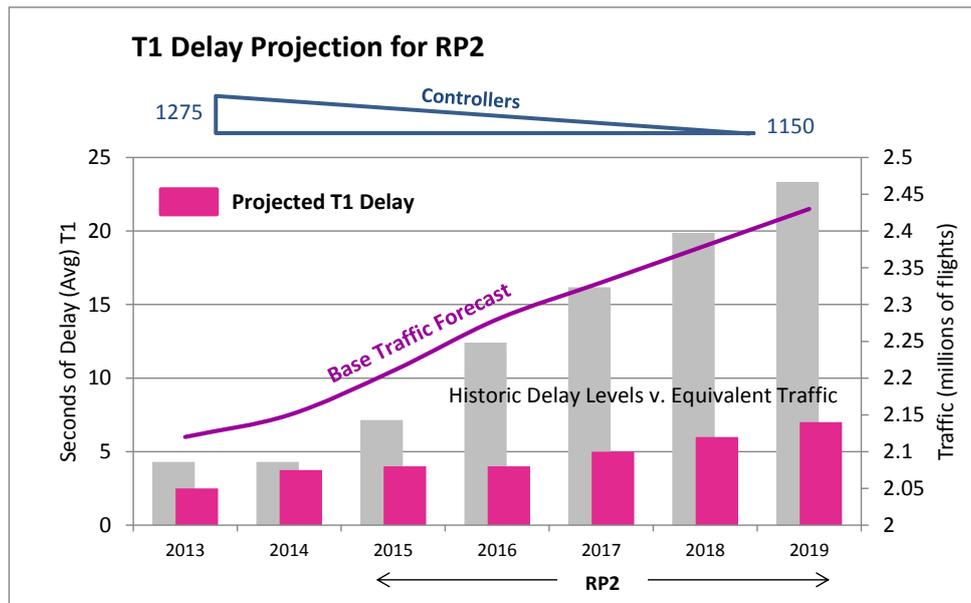
Specifically, the capacity of our airspace is determined by a combination of sector monitor values (MVs – the number of flights per sector per hour) and our staffing profile that shows how many and which sectors we can operate against forecast traffic. The MV and sector openings are used to estimate our delay performance.

Although no capital investment in RP2 is primarily targeted at providing capacity benefits (increased MVs), some investments (notably airspace developments) also deliver capacity benefits in addition to their primary fuel savings benefits. As a result, strategic service capacity will increase by 20-25 extra flights per busy hour by the end of RP2.

A projection of T1 Average Delay over RP2 is shown below. For comparison it also shows NERL's historical delay performance when traffic was previously at this level, highlighting the significant improvements in performance in recent years.

However, delivery of major change into our 24/7 ATC service has a potential impact on delay performance due to staffing demands for testing, validation, training and work-up as well as safety requirements for managing traffic demand during operational transition. Notably, LAMP is our biggest and most complex airspace change programme ever, increasing the likelihood of extra airspace regulation (delays) during transition.

There would need to be coordination between NERL and airlines around potential capacity restraints likely to be needed in implementing major projects. This would be carefully planned in close consultation with the customers and the CAA, providing additional delay allowances for major transitions during RP2 where necessary.



Airport and Non-ATFM Delays

Most types of airport delay have causal factors that are beyond NERL’s immediate control and therefore require action by all network partners to deliver improvements. These delay categories include:

- Airport ATFM delay – delays on the ground due to mainly to weather at the destination airport (strong wind being the most significant factor, especially at Heathrow) but including other factors too;
- Other ground delay – measured as start-up delay and excess taxi out time due to a range of factors including airfield ground congestion, local airspace factors (e.g. SID constraints);
- Airborne holding and sequencing delay.

Much of this delay is a function of the extent and nature of the airport ground infrastructure and the way in which traffic is scheduled.

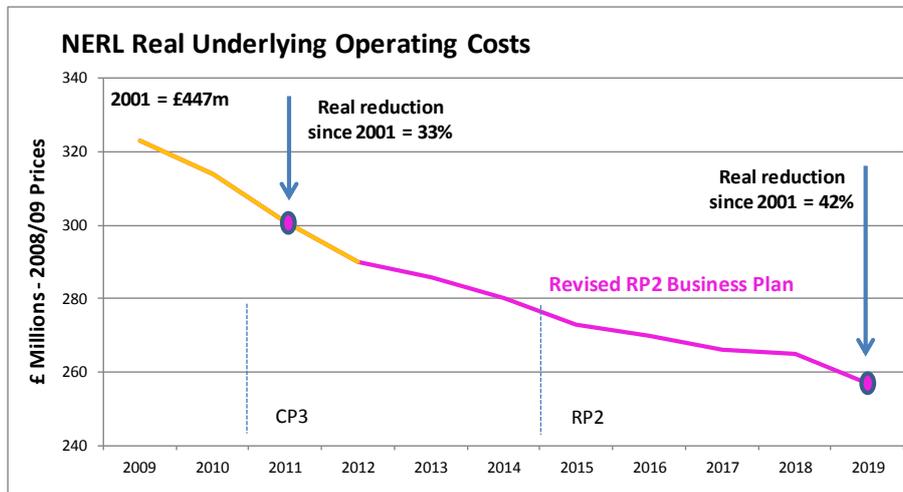
We plan to work with all network partners (airlines, airport operators, regulators and TANS providers) to achieve a significant reduction in airport delays and hence, airline costs. In combination with reducing fuel burn, our strategy for reducing airport delays is:

- Optimise the capacity of London and Manchester TMA airspace design to ensure a resilient airport operation at Heathrow, Gatwick, Stansted and Manchester (investment in LAMP and NTCA programmes);
- Queue management providing an efficient and more predictable flow of aircraft on busy runways with minimal airborne holding or start-up delays (investment);
- Implementing Time Based Separation to maintain landing rates during strong headwind conditions (investment);
- Improved network management capabilities to balance network demand / capacity from mismatches due to weather, airport issues (investment and manpower).

Our plan is also based on fundamental assumptions that there are no major changes in airport ground infrastructure, to current scheduling patterns and practice, or to Government policy on runway operations (eg. mixed mode).

6.1.4 Cost Efficiency

Our recent progress to date in significantly reducing operating costs in response to economic conditions is charted below, together with the output of the Business Plan expressed in real terms (2008/9 constant prices). It highlights the substantial reductions in real terms since PPP in 2001.



Manpower

Our manpower reduction strategy was outlined earlier in 'Plans Inputs', which amounts to a c.32% reduction in headcount by the end of RP2 since PPP in 2001. As the scale of the cost savings needed to achieve lower prices in RP2 requires us to take further action now to cut our cost base, our key manpower assumptions are shown in the table. A voluntary redundancy (VR) programme is already underway and staff are expected to start leaving the business at the end of 2013/14.

Headcount Progression Since PPP

	Start CP1		Current		End RP2	2019 v 2012
	2001/02	End CP2	(Dec-12)	End RP1		
Controllers	1,430	1,360	1,275	1,170	1,150	-10%
Operational Support Staff	930	630	565	490	465	-18%
Engineers	1,180	910	850	850	830	-2%
Support & Mgt	900	660	660	620	585	-11%
TOTAL	4,440	3,560	3,350	3,130	3,030	-10%
<i>Saving vs start CP1</i>		-20%	-25%	-30%	-32%	

The headcount reductions are delivered by:

- *In Operations:* further optimising our working practices, rostering and skill mixes, together with exploiting technology and airspace changes, and combining sectors / functions;
- *In Engineering and Infrastructure:* a further rationalisation and automation of tasks, combined with risk based asset maintenance and improved service management tools, that enable 'more with less';
- *In Management and Support:* through innovative use of IT and business intelligence tools to cut workload, and greater automation and productivity in back office functions.

Previously, in our Initial Business Plan we had assumed that an interim multi-sector planner capability would be introduced into the operation as part of our headcount reductions. Initial feasibility studies revealed that the work required to retrofit this

capability to the existing legacy systems would not have delivered sufficient benefit to justify the expenditure. However, the concept will be fully deployed with the iTEC system. We will seek to mitigate any shortfall in headcount reduction through further development of the other initiatives detailed above.

Further Consolidation

NERL has a 'Two Centre Strategy' which has saved considerable costs through closing the West Drayton and Manchester centres. From an operational and technical perspective the strategy (together with the 'sudden loss' capability at CTC) provides contingency for recovery of services in the event of a critical failure at either Swanwick or Prestwick.

Notwithstanding this strategic perspective, we have evaluated scenarios based on further consolidation of our operations, including closure of the Prestwick Centre in the RP2 timeframe which would continue the trend of consolidation of operational sites from two down to one, also recognising that centre rationalisation is a key desire of the European Commission.

Our analysis shows that a 'One Centre Strategy' (based on closing Prestwick) would not lead to real price reductions to customers in the RP2 period, due to the considerable associated restructuring costs (which would be incurred in RP2) and the time required to deliver such a project (which would mean that the associated savings would only begin to be realised at the end of RP2 and early RP3).

Also, we could not deliver Prestwick closure and the Business Plan headcount reductions simultaneously. Given the challenges that would need to be addressed, further consolidation to one centre would require significant resources (which are already required to deliver the very real cost reductions being proposed within the Business Plan) to be diverted to this project, deferring these cost reductions until after RP2. As such, any savings from a one centre strategy would be instead of, not as well as, the cost reductions already proposed in our plan. We would consider it to be unrealistic to aim at achieving both cost efficiency targets in our existing infrastructure as well as undertaking major structural change in the same period.

Furthermore, while our CTC provides a level of disaster recovery and redundancy for most scenarios, Prestwick is a key part of our operational contingency. A catastrophic incident that rendered Swanwick permanently unavailable would have less impact on UK airspace with a fully functioning dedicated centre in Prestwick (providing a route to re-establishing a full service) than without a second centre.

For these reasons, we have decided not to propose the closure of the Prestwick Centre in RP2, but instead to concentrate on creating a lean and agile operation across the NERL business that is well prepared for the challenges ahead, and that would deliver the real price reductions in the timeframes required by our customers.

Additionally, as our technology and ANSP partnerships progress, we will continue to look at further structural integration within our alliances where there is net benefit to customers.

Other Initiatives

Our other major initiatives to reduce operating costs include:

- Securing staff pay awards that reflect our pricing arrangements (CPI) and company performance, and including more elements that are discretionary;
- Changes to pension arrangements, including a reduction in the cap on pensionable pay increases and indexation of future service at CPI, to ensure the affordability of the company's pension costs during RP2 and to help mitigate the impact of adverse market conditions;
- Significant external contract re-negotiations to increase value for money;

- An even tighter focus on asset management including reduced service and support costs at the expense of greater risk of failure;
- Rationalisation of non-operational IT provision with reduced service levels;
- Prioritisation of work with European agencies such as CANSO, EASA, Eurocontrol, SESAR, CAA, FABs.

Industrial Relations Risk

NERL has good relations with trade unions, but the number and extent of current reforms (working practices, pay, pensions, redundancies, etc.) are testing that relationship. Therefore, this plan aims to carefully balance the need to maintain good industrial relations with the need for further reform.

Industry estimates of the impact on airlines of one day of major disruption due to industrial action by ATC vary between c. £100m per day (IATA estimate based on Icelandic volcanic disruption) and £150m per day (Centre for Economics and Business Research). Taking a conservative value of £50m per day for closure of UK airspace, less than a week of industrial action could eliminate the cumulative operating cost savings in this plan over RP2.

Benchmarks

The 2011 ATM Cost Efficiency (ACE) benchmarking report by Eurocontrol's Performance Review Unit (PRU) showed that NERL has the best overall gate-to-gate financial cost effectiveness performance of its comparator group of ANSPs (see detail in Appendix B). It is also equivalent to that of NERL's FAB partner, the IAA. This plan would deliver improvements to NERL's performance against these ACE metrics.

Further PRU analysis showed that, while European ATM was more expensive overall than the USA, NERL was very comparable on the support costs ratio compared to the USA in 2011.

As part of their RP2 process, the CAA has commissioned a number of consultant studies to consider NERL's efficiency in specific areas against industry benchmarks across a range of different sectors. However, these studies will report after this Plan is finalised, but will be considered by the CAA and incorporated into the National Performance Plan (NPP) where appropriate.

6.2 Integration with Single European Sky

Improve our efficiency and flexibility through FABs, SESAR and Alliances...

Strategy

RP2 will see moves towards SES, both technologically through the SESAR programme and geographically through the emergence of new partnerships and alliances. Our strategy is to ensure we continue to play a key role in delivering improved performance to our customers through:

- Expanding the scope and depth of our FAB and alliance operations in order to secure added value or cost savings;
- Co-ordinated implementation of SESAR with ANSP partners, including aligned investment plans, to deliver maximum benefits to users of the network via the established SESAR deployment mechanisms;
- Key business relationships with industry and amongst our partners, and working with them effectively to deliver earlier benefits from European ATM integration.

UK/Ireland Functional Airspace Block (FAB)

The primary objectives of the UK-Ireland FAB are to enhance safety, increase the efficiency of FAB airspace and to reduce costs to airspace users. The UK-Ireland FAB has generally been more progressive than others in delivering benefits to customers. For example, as a result of optimising FAB airspace, estimated savings to customers since its inception amount to over €70m including 73,000 tonnes of fuel.

The current UK-Ireland FAB ANSP Report 2012 outlines the key development areas in relation to the evolution of FAB operations towards SESAR concepts, the technical convergence of the FAB and evolution of network management. To be set out in 2013/14 in joint plans on strategic operations, technical convergence and network management evolution, these development areas include:

- Harmonised safety management across the FAB;
- FAB high level sectors to provide free-route airspace including dynamic sectorisation between IAA and NATS (ie. delegation of service both ways across the FIR boundary) – all subject to demonstrating a business case (fuel saving benefit) to customers in an operational trial in 2013-14;
- Further evolution of FAB network management and enhancements to the Flexible Use of Airspace;
- A UK-Ireland FAB queue management solution to optimise the use of terminal airspace and runways;
- The potential introduction of 3Di in the UK/Ireland airspace to better tailor flight profiles in the total FAB airspace;
- Optimisation of engineering infrastructure;
- FAB engagement in the ICAO North Atlantic (NAT) 2025 Taskforce (see 6.3 Oceanic Services);
- Initiatives with other FABs – such as co-operating with FABEC over the application of queue management for flows into UK airspace in the south east, and the FAB 4 co-operation between 4 ANSPs (Denmark, Sweden, Ireland and UK) – in order to extend FAB specific initiatives and benefits over wider airspace.

Cost Efficiency

FABs have been founded mainly on the basis of geography rather than commercial synergy. With major differences between NERL and the IAA in complexity of operations and technology deployed (see below), direct cost efficiency savings are more challenging than airspace improvements. We have considered a number of cost efficiency options with the IAA such as joint procurement and training, but concluded that material savings are not achievable.

	NATS	IAA
Annual flights	2.2m	0.5m
Airspace complexity score	11.05 (London TC = 33.5)	1.64
Annual traffic at largest airport	476k (Heathrow)	162k (Dublin)
ATCOs on operational duties	928	146
Top 5 capital projects	€613m	€98m
Main technology platform	NAS / iTEC	Coopans
Legal status	Private limited company	Public authority

Sources: PRU ACE 2011 benchmarking analysis and airport operators' traffic data

For RP2, the FAB is examining further opportunities for cost efficiency. We have assumed that FAB cost saving initiatives in RP2 will enable a £5m reduction in NERL's cost base by the end of RP2; this estimated saving has been factored into our plan at risk.

We will continue to consider with the IAA opportunities for further improving performance in the longer-term.

The European Commission is consulting on an update of the SES rules (SES2+) which includes a legislative package to further develop the FAB concept so that it becomes a more performance driven and flexible tool for ANSPs, based on industrial partnerships. This emphasis on ANSP commercial alliances and FAB alliances may open up new consolidation opportunities, for example with the Scandinavian countries.

SESAR

Single European Sky ATM Research (SESAR) aims to develop the new generation air traffic management system capable of ensuring the safety and fluidity of air transport worldwide over the next 30 years. Its main phases are:

- The Development phase (2008-2013) to produce the required new generation of technological systems, components and operational procedures as defined in the SESAR ATM Master Plan and Work Programme.
- The Deployment phase (2014-2020) which will see the large scale production and implementation of the new air traffic management infrastructure, composed of fully harmonised and interoperable components guaranteeing high performance air transport activities in Europe.

NATS has been actively participating in SESAR from the beginning, notably as a member of the SESAR Joint Undertaking (SJU) throughout the Development Phase. NATS is the leader for the TMA Operations work package, as well as being involved in many other projects throughout the programme.

Our involvement in SESAR has given us the opportunity to contribute to and influence the emerging concepts to ensure that they can be successfully applied in our airspace, as well as the opportunity to validate many of them directly in UK airspace. Additionally

NATS receives 50% funding from the SJU for research undertaken in support of SESAR, which has provided a positive contribution to the costs of our research activities, as well giving us access to research carried out by the many other SJU partners.

RP2 will see the SESAR deployment phase underway aimed at implementing the next generation ATM infrastructure and operating methods. In concert with the other major European ANSPs participating in SESAR (the A6 group) our strategy is to ensure a pan-European solution and lower unit costs through collaboration.

SESAR deployment will be a complex process. The EC is proposing a 'pilot common projects' (PCP) concept for those key programmes that need to be synchronised across the industry (airspace users, airports and ANSPs) by an industry-led 'Deployment Manager' function. We already have plans to deploy some PCPs (eg PBN as part of LAMP & NTCA), whereas others require further evaluation.

The EC has committed €600m of new funding to SESAR to be managed by the SJU whose mandate will be extended until 2024. Nevertheless, a key challenge is the heavy investment call on the industry to make SES a timely reality in the current economic climate. Common project roll-out is therefore likely to be on an agreed business case basis with an equitable share of risk.

As a key step towards making the business case for airlines, we will continue to work within the A6 Group to:

- Ensure the next edition of the SESAR Master Plan (due in 2014) contains a robust assessment of deployment costs for all stakeholders and the net benefits it will enable;
- Press for the EC to accelerate setting up the 'Deployment Manager' as an essential prerequisite to timely deployment.

SESAR Pilot Common Projects (PCPs)

Mature SESAR concepts that deliver clear benefits, requiring co-ordinated deployment across Europe in the 2014-20 timescale:

- Extended Arrival Management (AMAN) and Performance Based Navigation (PBN) in high density terminal airspace
- Flexible Airspace Management and Free Routes
- Collaborative Network Management
- Initial System Wide Information Management (iSWIM) functions
- Initial Trajectory Information Sharing (i4D)

Alliancing Strategy

Given the strong EC regulatory focus on addressing the future SES defragmented ATM system, achievement of future regulatory requirements through isolated national action by ANSPs will be challenging. Therefore, there is growing pressure for operationally beneficial partnerships which build on, or compliment, the current frameworks (FABs and SESAR) to deliver the future SES ATM system.

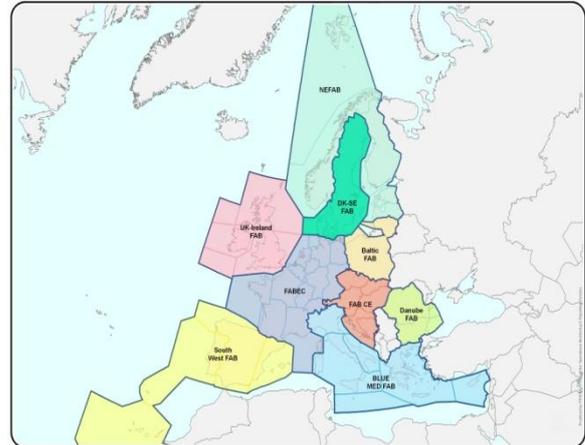
Over the past years NATS has entered into a number of alliances with a view to positioning itself as a European leader in ATM within the context of SES. The form and nature of these alliances varies, but fundamentally they have been focused on delivering operational benefit to our customers.

For example, we continue to be the driving force in the A6 ANSP alliance that is focused on SESAR deployment. Additionally, the Borealis Alliance (of 8 EU countries across three FABs plus Iceland) is exploring a free-route airspace project across all nine countries which will deliver significant customer and environmental benefits, and a move to implement a shared services approach to reduce service provision costs.

The strategy for RP2 is to develop current and future alliances with ANSPs as 'commercial ventures', with regulatory issues being handled at a National level thereby avoiding State engagement in ANSP activities (other than National regulatory issues) which has to date hampered some FAB and ANSP alliance initiatives.

Work by NATS is still at an exploratory stage, but this wider co-operative model is likely to deliver greater benefits to customers in RP2 than the current FAB approach. In particular, areas of greater opportunity include:

- Network management across large airspace areas;
- Extended and joined-up free route airspace;
- Harmonised technical deployment of SESAR;
- Consolidation of support services;
- Wider customer engagement – eg enlarged OPA and SIP planning processes.



6.3 Oceanic Services

Innovating to improve flight efficiency within North Atlantic airspace...

NERL’s business includes regulated Oceanic services which currently fall outside SES, and therefore this section separately identifies the strategies, outputs and price for this service for its Control Period 4 (CP4 2015-2019).

NERL provides the ATC and datalink services in the Shanwick Oceanic Control Area (OCA) under the remit of ICAO, with the IAA providing HF communications. Since the 2001 PPP, NERL has reduced the number of operational staff on Oceanic services from 107 to 62 (a reduction of more than 40%).

While not currently within SES and FAB arrangements, the recent SES2+ package has proposed extending SES to Oceanic services but this is unlikely to take effect in RP2 should such a proposal be agreed.

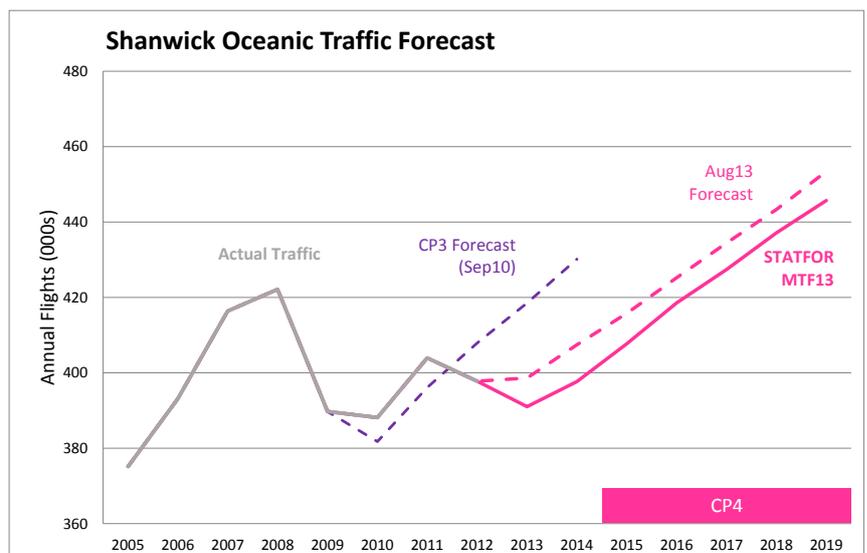
Strategy and Plan

Despite a prolonged period of reduced capacity in the North Atlantic (NAT) region, the STATFOR forecast indicates an upswing in traffic through 2015-19.

Our strategy is to continue service improvements within the current method of operation, which will enable us to manage costs whilst improving service quality gradually at minimal investment.

In line with the ICAO’s North Atlantic Systems Planning

Group’s (NATSPG) plans for the region, we will continue to improve our Oceanic services by delivering improved performance to our customers through:



- Investing in new ground-based flight data processing (FDP) systems;
- Deploying new, consistent methods of operation that leverage aircraft equipage and reduce safety risk, leading to conservative reductions in North Atlantic separation standards;
- Delivering sustainable improvements in safety, service quality, fuel and CO₂ reductions;
- Maintaining key business relationships with industry and amongst the wider North Atlantic partners, working with them to support earlier benefits from North Atlantic and European ATM integration.

Our Initial Business Plan had assumed that the existing SAATS FDP system would be replaced in CP4/RP2 at the end of its planned life. However, Nav Canada has made the replacement system (GAATS+) available earlier than previously planned and offered to share development costs, which in turn reduces costs and leads to earlier delivery of flight efficiency benefits to customers. Therefore, we now plan to accelerate the GAATS+ investment for completion by the end of CP3/RP1 (via the Collaboration on Oceanic Airspace & System Tools project – COAST). The overall effect is a small reduction in prices in CP4/RP2, but no impact on prices in CP3/RP1.

While the current Oceanic operation is safe, simple and cost effective, we are working with Nav Canada and ICAO to develop the NAT 2025 Task Force strategy for Oceanic services. This strategy is aimed at gradually removing some of the existing constraints through investment in a number of new technologies and capabilities, which could provide improvements to flight trajectories and fuel efficiency. It would also ensure alignment between the North Atlantic Oceanic operation, North American and European airspace in light of Next Gen and SESAR ATM programmes.

We expect to consult customers during RP2 on the costs and benefits of deploying new technology and capabilities into our Oceanic operation to support enhanced trajectories over the North Atlantic and efficient sequencing of traffic into domestic airspace.

Plan Outputs

Date	Key Output
	Safety
On-going	Meet target levels of safety in line with projected traffic growth Vertical risk reduction and improved error capture (supported by CPDLC and ADS-C) Reduction of co-ordination errors (ATC Inter-facility Data Comms – AIDC)
	Service Improvements
2015	Full implementation of Reduced Longitudinal Separation Standards (RLongSM) Trial of Reduced Lateral Separation Standards (RLatSM) Deployment and validation of satellite based surveillance capability (2015-18)
2016	Final expansion of FANS mandate
On-going	Flight planable speed and vertical flexibility Request monitor (improved access to requested levels) and GoFli (improved access to available levels) Introduction of revised Required Communications and Surveillance Performance standards (RCP / RSP Standards)
	Environment
	Oceanic service improvements contributing to NATS CO ₂ reduction target through minimising lateral track extension and improving vertical profiles

Costs and Price Profile

We have a relatively small and specialist Oceanic operational manpower team and a low level of investment in the service. Approximately 40% of Oceanic operating and investment costs relate to Oceanic specific activities, with 60% relating to costs shared with NERL's En Route business (eg site, engineering and management / support costs). While the direct costs remain relatively stable, the overall cost base reduces as a result of NERL's cost savings.

Average Oceanic price reduces by c.20% between end CP3 and end CP4, just over half of this price reduction stemming from efficiencies and just under half coming from higher forecast traffic volumes.

REVISED PLAN	
Average price in RP2 (£/flight, 11/12 prices)	£52.21
Price reduction between end CP3 and end CP4 (profiled)	-£11.63 per flight (-20%)

6.4 Investment Strategy and Portfolio

Strategy

NERL's longer-term objective is to move towards SESAR 4D trajectory operations and, in doing so, to be able to control any plane, anytime, anywhere through a standardisation of technology, procedures and processes. This objective is intended to make a more efficient total operation that is delivering safety, environment, capacity and cost efficient benefits to customers. NERL's operations will become more software driven and strategic, with no more geographic validations and requiring fewer ATCOs and engineers. Consequently, all investment is in service of this objective that is tightly coupled to the European ATM Master Plan for SES.

Against this objective, our investment strategy for RP2 is a balance between:

- Appropriate efficient investment in light of the key customer requirement for lower prices;
- Appropriate efficient asset replacement / upgrade consistent with our licence obligations, but avoiding nugatory spend (investment and operating costs) on ageing systems;
- Delivering major FAS investments in RP2 – the LAMP and NTCA programmes in particular – to enable fuel saving benefits for customers as early as possible;
- Fulfilling mandatory / regulatory requirements, including EU implementing rules;
- Meeting EU safety, capacity, environment and cost efficiency performance targets;
- Delivering operating efficiencies / productivity in support of reducing ATCO numbers;
- Maintaining investment in future capability towards SESAR trajectory operations;
- Working with partner ANSPs to share investment costs and development risks, securing external funding where possible (eg EC TEN-T scheme).

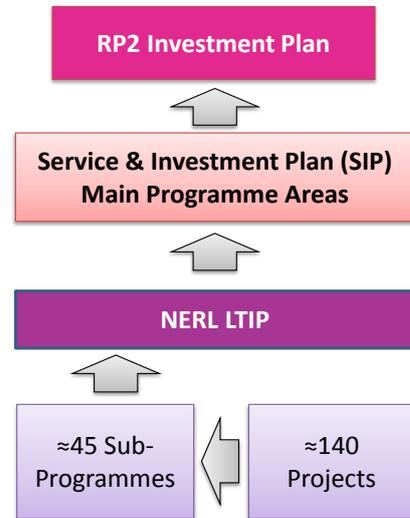
Investment Portfolio

The RP2 investment plan comprises a set of highly inter-related investments, with complex interdependencies between some ~45 individual programmes and ~140 projects – i.e. changes to one element have a ripple effect on the costs, benefits and risks of others. For this reason, the plan is relatively indivisible.

Programme Areas

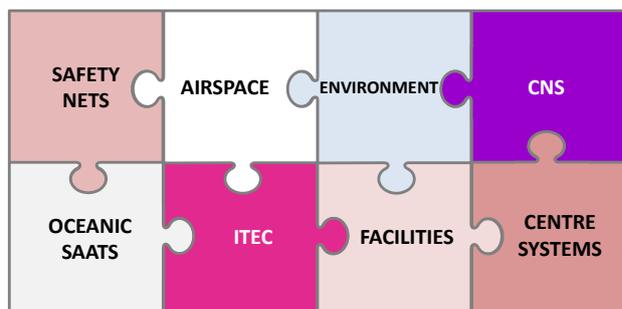
NERL's Service and Investment Plan (SIP) sets out a number of strategic programme areas (based on the aggregation of the sub-programmes and projects) that are used as the basis for dialogue with customers on the content, costs and benefits of the investment plan. The SIP programme areas enable dialogue to be focused on a manageable level of detail.

Investments have therefore been grouped into these programme areas as follows:



- *Airspace Developments:* projects that revise airspace and route network structures, including those investments that are required to deliver airspace concepts supporting the NERL/IAA FAB, FAS, FABEC and the FAB4/Borealis alliances. These projects are focused on improving the safety and capacity of the network together with providing fuel savings through improved routing and network structures.
- *Centres Systems Software Development:* projects that will sustain or enhance existing systems at the Swanwick and Prestwick Centres and the Corporate & Technical Centre, including iFACTS, Electronic Flight Data, Air/Ground Datalink and similar software-based applications. These reduce the underlying risks of system failure / interruption through appropriate sustainment / enhancement strategies as well as enhancing Traffic and Airspace Management systems to enable the improvement network efficiency from Airspace Developments.
- *CNS Infrastructure:* projects that will sustain and enhance the remote infrastructure facilities and allied ground data distribution networks. This programme will enhance ground based communications networks to provide System Wide Information Management (SWIM) compliant infrastructure, reduce the use of ground-based navigation aids and deliver new technologies as they become available. These projects underpin the resilience of our key communication and navigation infrastructure.
- *Safety Nets and Airspace Efficiency:* projects primarily focused at providing controllers with automated safety nets and tools to maintain, and where possible improve, the safety of the operation.
- *Environment (CO₂ and Fuel Savings):* projects that will provide aircraft with more efficient flight trajectories thereby reducing operator fuel costs.

INTER-DEPENDENT SIP PROGRAMME AREAS



- *iTEC FDP*: projects that will deliver advanced systems and tools to provide the platform for SESAR-based operations, notably iTEC-FDP, iTEC-NCW and allied controller safety and productivity tools.
- *Development of SAATS*: on-going development of the Oceanic flight data processing system used to support operations in the North Atlantic region.
- *Facilities Management*: projects that maintain building, accommodation and allied facilities across the NERL estate to enable other services to be provided. The estate consists of our Control centres at Swanwick and Prestwick, our corporate and technical centre and over 150 remote navigation, surveillance and communications sites.

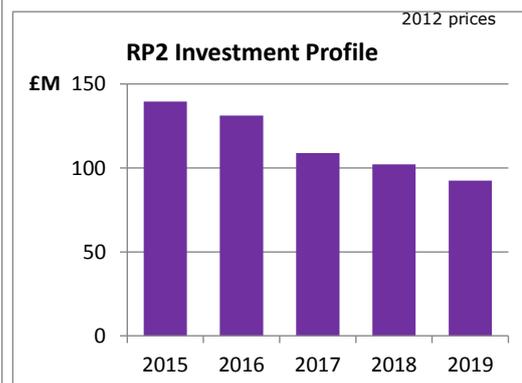
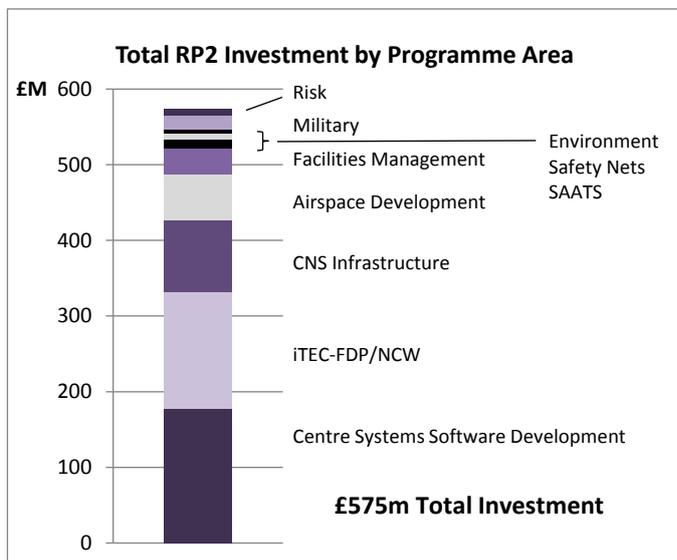
The Investment Plan also includes military investments that will be progressed to meet the needs of the MOD, but these are paid for by MOD under the FMARS contract.

Investment Costs and Profile

In response to customer consultation, our revised investment plan is primarily based on the Plan 2 capital investment (£560m) with the exception of Airspace Development where the Plan 1 Airspace Development (+£15m) is included incorporating faster delivery of the benefits of the LAMP and NTCA airspace programmes – a key customer priority.

Total capital investment is £575m (v. Plan 1 investment of £610m). This cutback in planned investment will delay some infrastructure replacement at the expense of an increase of service resilience risk as the current systems age, and also delaying the timeframe at which SESAR 4D trajectory concepts can be fully introduced.

We have taken a portfolio view of risk and opportunity to ensure that risk funds are sized correctly, in particular taking advantage of the likely efficiencies and opportunities within the plan.



Benefits Delivery

The customer requirement for NERL to deliver investments to commitments – cost, schedule and benefits – will continue to be managed via the SIP process. Additionally, given a 7 year time horizon to the end of RP2, the SIP process enables flexibility to adjust investment in response to changes in customer requirements.

The current view of the combined benefits of the RP2 investment plan is shown in the table. However, whilst the expected benefits have been estimated, the ultimate outcome of the investment plan depends upon changes that might be made by the airline industry in RP2 and how these can be accommodated in an increasingly complex operational environment.

Benefit Category	Estimated Benefit Enabled by RP2 Investment
Safety	43 point reduction in NERL weighted SSE index
Fuel Savings	c. 1 million tonnes CO ₂ pa (including oceanic airspace and at airports)
Service Capacity	20-25 extra flights per busy hour
Operating Costs	c. £10m pa reduction
Asset Sustainability	Reduction in net weighted business risk of c.£520m
Carbon Footprint	Reduction of c. 3.4 million tonnes CO ₂ pa across NATS estate

NERL has provided supplementary information on its investment strategy to the customers and CAA through the customer consultation process, including the costs and benefits of major projects. That material forms supporting documentation for this plan.

Deliverability

A key issue for customers was assurance that investment would be delivered to support customer benefits, aligned to the FAS timetable and synchronised with cockpit technology. Greater collaboration between customers and NERL (working together similar to airport capex plans) was considered the best way of going forward to help shape NERL's investment projects, to enable greater visibility of efficient capital costs and value for money, and to provide assurance on customer benefits.

Delivery Capacity

Opex and capex are not independent – projects with large training requirements require opex (controllers) to deliver them. The ATCO manpower in this plan will enable us to carry out training programmes for the introduction of new airspace, system capabilities or technology without resorting to major flow restrictions (but within delay allowances agreed with customers and the CAA). However, with fewer and busier controllers, the pace of change in RP2 is constrained.

In terms of capability to deliver projects, NERL continues to improve its capex delivery process through better governance and change teams, and through reducing delivery risk by simplifying implementation and applying industry lessons.

Efficient use of capex is supported by key processes such as:

- Project and risk management – ensuring that investments are properly prioritised, and that risks are assessed and mitigated;
- Value engineering – ensuring that the right 'value for money' solution is provided to meet requirements with no 'gold plating';
- Asset management – targeted at minimising the through life costs of assets;
- Supply chain – commercial best practice to work with suppliers to secure best prices and with ANSP partners to share costs and risks where possible e.g. iTEC;
- Cost optimisation – to deliver projects faster for less.

However, not all investment risk is within our control – notably in major programmes such as LAMP and iTEC:

- Successful delivery of the full benefits of LAMP will require completion of actions by industry partners in FAS (eg Transition Altitude and PBN) as well as extensive public consultation on airspace changes. There is also risk around runway capacity in the south east;

- While initial benefits of iTEC should be delivered in 2015-16, the full benefits of iTEC are longer-term (in RP3) and coupled to co-ordinated delivery with other ANSPs of emerging capabilities from the current SESAR development phase, with consequent risk until the business case and process for SESAR deployment is demonstrated.

Governance of Benefits Delivery

We assess the relative costs and benefits of every project, the proportionality of cost v. benefits being examined by passing a stringent business case test before significant funds are committed. This includes demonstrating the economic value to customers.

However, customers sought a clearer view of the costs, benefits and timetable for key programmes and projects, and considered that a collaborative governance process similar to the 'gateway process' at airports would help shape NERL's investments to support delivery of customer benefits. Furthermore, adoption of core and development capital expenditure categories could address uncertainties in the ATM environment (e.g. forecast traffic levels) and provide a more helpful approach.

We therefore propose to enhance the current SIP process to enable greater engagement with customers on shaping the investment plan and its key investment projects, and to provide better visibility of business cases and timescales.

Customers also wanted inclusion of 'benefit triggers' within the investment plan to provide incentives for NERL to deliver the benefits of its investment in full. They acknowledged that the EC performance regime played a role in ensuring the delivery of benefits, for example incentivising investment in flight efficiency, service quality-related investment (capacity) and sustainment investment (as system failure increases delay).

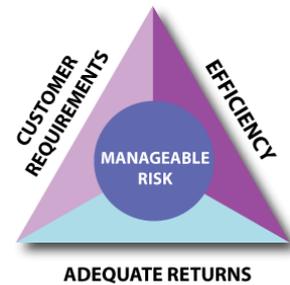
We do not believe the traditional forms of 'trigger' would be appropriate for NERL because of the extent of project interdependencies and the need to comply with EU regulations. Furthermore, fixed trigger points might run the risk of unintended consequences as a result of inflexibility to respond to changes to customer priorities, traffic, SESAR requirements – potentially resulting in a net disadvantage to customers. We believe that a better basis for incentives is the existing output based metrics (for fuel efficiency and service quality) rather than measures for specific project based inputs. The CAA will need to reach a decision on incentivisation.

6.5 Plan Risks

A key tenet of our business model is meeting customer requirements with manageable risk and adequate returns.

While taking and managing appropriate levels of risk is an integral part of all our business activities, this plan is being produced at a time of uncertainty in both future traffic levels and the ramifications of the SES RP2 performance regime. Furthermore, the substantial cost savings we propose will import more risk to our business.

An outline of major risks and mitigations is set out below, some of which are inter-related.



The biggest risks to the Plan

Risk	Cause and Impact	Mitigation
Economic outlook and traffic risk	On-going uncertainty in future traffic levels due to the continuing effects of the global financial and economic crisis especially in the Euro zone. Any significant traffic shortfall v. forecast will invoke volume risk sharing and increase price (on n+2 basis)	Align plan to STATFOR traffic forecasts to ensure tight correlation to latest economic indicators
Outcome of Airports Commission on infrastructure development	The uncertainties surrounding future airport infrastructure in the South East could compromise NATS' ability to design airspace structures for the longer term, eroding enabled fuel savings for customers and requiring re-work necessitating offsets in RP2 investment (or additional investment funded by customers)	Maintain a close dialogue with the Airports Commission on interim and longer-term measure to alleviate capacity / resilience constraints. Contribute expertise and evidence to support decision making.
Single European Sky legislation	More implementing rules from the EC than expected, at a time that does not align with our investment plans, impacting investment priorities requiring offsets in RP2 investment (or additional investment funded by customers)	Work with the CAA/DfT on influencing the development of the European legislative / regulatory framework to ensure it is compatible with UK needs
Pension liabilities	An escalation in pensions costs due to economic factors, resulting in higher prices in RP3	A pension mitigation plan that limits exposure to increases in legacy (defined benefit) pension costs
External cyber security threat	Affecting our systems and disrupting our operations, potentially closing our airspace or airport ATC with a disproportionate effect on customers operations.	Our on-going programme of work to strengthen system access and security controls

Reducing our costs imports more risks

Risk	Cause and Impact	Mitigation
Safety improvement not sustained	We will never compromise on safety nor permit an unsafe ATC system, but further degradation of plan inputs might slow the rate of improvement v. rising traffic	Focus on safety improvement areas which address the main risks to our operation including underlying causal factors
Industrial relations	Large staff cutbacks strain relations with our highly unionised workforce, dissolving the 'working together' partnership, making progress with the RP2 plan more difficult and potentially impacting service resilience and increasing delays to customers	Connected, convincing and trusted leadership Open communication and cooperative engagement Appropriate release terms
Reduced maintenance activity	Degrades equipment availability which leads to more flow restrictions (customer delays) to ensure safety	Integrity of the operational system and its resilience to failure Specific engineering measures directed at mitigating the risk of failure and service disruption
Lower capital expenditure	Creates a backlog of required investment leading to increased operating costs and higher investment in RP3 and RP4, increasing price to customers in later periods	Predict and understand the impacts on our business and customers in order to have an informed debate on adjusting investment priorities through the annual SIP process
Capacity/demand imbalance in medium to longer term	Too few ATCOs as traffic grows in RP3 against a 2-3 year lead time to deploy more controllers together with later delivery of SESAR concepts, impacting service resilience through RP3 & RP4 and increasing delays to customers in the longer-term	Avoid deeper cutbacks in front line operational staff and investment during RP2 Flexible working practices and tools that permit an agile response to changes in demand

7 Next Steps

The CAA and EC processes continue through to late 2014 as shown below. We expect the CAA to consider updating our RP2 Plan for:

- CAA decisions – informed by the CAA consultant studies and its own findings
- CAA’s London Approach consultation
- Any further updates to PRB methodology for targets
- Updates for the latest traffic and inflation forecasts, and for 2013/14 actuals.

