An Industry Proposal for the Italian National Airspace Strategy

2018 to 2035

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Executive summary

The aviation industry's proposal for an Italian National Airspace Strategy (NAS) describes how the ongoing modernization of Italy's airspace will be delivered.

The strategy aims to bring all aviation stakeholders together, including airports, aircraft operators, Air Navigation Service Providers, the Military, Regulator and Government behind a common vision, to deliver:

"A safe and efficient Italian airspace that has the capacity to meet demand, balances the needs of all users and mitigates the impact of aviation on the environment"

The demand for aviation in Italy and across Europe is greater than ever before. In 2017, Italy's Air Navigation Service Provider - ENAV, managed a total of 1.86m flights with peaks of over 6,800 per day.

Italy's airspace requires ongoing modernization to continue to service the growing demand from commercial air transport, the Military and general aviation and new fast-growing user groups such as unmanned aerial vehicles.

As well as enabling growth, airspace modernization also offers opportunities to:

- reduce and remove risk factors from the existing airspace and introduce new concepts that support the safety critical tasks of pilots and air traffic controllers.
- tackle hotspots of congestion within the current airspace network.
- improve the resilience of the airspace network to bad weather and other forms of disruption.
- better manage the environmental impacts of aviation, especially aircraft emissions and noise per flight.

The Italian NAS forms a key part of the wider Single European Sky (SES) program (which provides the overarching framework to modernize the airspace across Europe) and proposes the creation of joint Government, Regulator and Industry arrangements to coordinate and support the implementation of initiatives at a national level.

Executive summary

Airspace modernization involves the implementation of new airspace structures, operational concepts, technologies and procedures including:

- Replacing the fixed route structure in the upper airspace with the Free Route Airspace concept, allowing aircraft to follow optimized flight paths without restrictions.
- Redesigning the busy terminal airspace using more precise and flexible routes, based on satellite navigation standards.
- Deploying new air traffic management techniques that sequence traffic to improve arrival and departure punctuality.
- Redesigning airport arrival and departure routes so flights can climb and descend continuously, reduce fuel burn, emissions and better manage the impacts of aircraft noise.
- Connecting airports into the network to provide and receive accurate information about traffic flows which will better manage ground delays and pinch points across the airspace.

The Italian aviation sector is already investing significantly in airspace modernization initiatives. In recent years, many important projects have been implemented, and others are being developed by the ANSP (ENAV), airlines and airports working in close collaboration.

Some initiatives are more advanced compared to the general progress made across States in the SES ATM Research (SESAR) Deployment programme. The NAS will help to share Italian experiences with SESAR partners for the benefit of the European network.

Airspace modernization brings significant benefits; reducing flight delays and operating costs for the industry; and increasing global connectivity, choice and value for consumers. However, these benefits come with an environmental cost, both at the local and global level.

As a result, the Italian NAS aims to provide clear direction for industry stakeholders to build on the progress already made and ensure that Italy leads the way in exploiting opportunities to better manage the environmental impacts of aviation.

Executive summary

The industry's proposal for an Italian NAS is based on the recognition that engagement and collaboration across all aviation stakeholders is essential to implement the strategy successfully and maximize the benefits of continued airspace modernization for passengers, airspace users, airports, local communities and the wider economy.

In this context, the authors (ENAV, IATA, Alitalia and Assaeroporti) commend this first edition of the Italian NAS to all those with an interest in the future of the Italian aviation market and encourage stakeholders to provide feedback and participate in the modernization process as the strategy enters the implementation phase from 2019.

PART 1: INTRODUCTION

Context

NAS vision and benefits

Airspace and the environment

Progress update

1.1 Context

This industry proposal for an Italian National Airspace Strategy (NAS) describes the strategy for the ongoing modernization of Italy's airspace through to 2035. The proposed strategy is intended for all those with an interest in the Italian aviation sector including the government, military, passengers, aircraft operators, airports, air navigation service providers (ANSPs), companies that rely on air transport to conduct their business and communities that may be affected by the environmental impact of aircraft.

Aviation keeps people connected with one another and provides the international access that the country needs for business and tourism. Italy is a global trading nation and home to one of the world's largest economies. The speed and international reach of aviation is a key driver of economic growth, for example:

- The aviation sector contributed €58.3bn to the overall Italian GDP in 2016.
- In monetary terms, 35% of all Italian trade in 2016 was transported by air.
- Air transport is estimated to generate a 4.7% increase in foreign investment for every 10 per cent increase in the number flights.

The aviation industry recognises that the airspace and air transport network are key parts of the country's infrastructure and that the sector relies greatly on their performance to operate efficiently and continue to grow.

The Italian aviation sector has grown significantly in the last 40 years driven by globalisation, the growth in real incomes and a greater desire from the public to travel abroad. Demand forecasts predict that the total number of flights in Italian airspace will continue to rise significantly out to 2035 and beyond. Airspace modernization is needed to accommodate the growth in demand for aviation, while enhancing safety, operational resilience, market competitiveness and environmental performance.

Italy's airspace is situated in the core of central Europe, one the world's busiest air corridors. Its efficient operation is crucial for international Air Traffic Management (ATM). As a result, the implementation of new airspace structures, operational concepts, technologies and procedures described in the NAS are closely linked with the Single European Sky (SES) initiative that coordinates airspace modernization across the continent and ensures alignment with global developments.

| Overview of Italian airspace

Flights in Italian airspace can be categorised into three types: Commercial Air Transport carrying fare paying passengers and cargo, General Aviation and the Military. There were 1.8m commercial air transport flights in 2016 with peaks of up to 6,575 per day. Flights travelled to / from 45 airports, of these:

- 42% were international flights;
- 19% were Italian domestic flights; and
- 39% were overflights en-route to another final destination.

Italian airspace can be grouped into two main categories, controlled and uncontrolled. The majority of commercial flights in Italy operate in controlled airspace under the monitoring and direction of ENAV – Italy's civil air traffic control company. ENAV manages over 750,000km^2 of controlled airspace, 60% over the sea and 40% overland. The top ten airlines operating in Italy are:

The General Aviation sector that includes private pilots in light aircraft, gliders, microlights and a wide range of other operators mainly use uncontrolled airspace. Airspace modernization is expected to improve access to airspace for General Aviation, by enabling greater integration of different airspace user groups. In this respect the pressing emerging challenge related to the rapidly evolving Unmanned Aircraft Systems (UAS) market has to be considered as it is bringing new levels of complexity and will trigger specific additional needs.

The military is a significant user of both types of airspace to protect the country's borders and often operates within the confines of dedicated training or danger areas. In addition, Italian airspace is increasingly required to accommodate unmanned aerial vehicles, which can be remotely piloted or autonomous. The Italian Airforce (ITAF) provides services at airports that are for military purposes or open to civilian traffic.

Italian airspace is divided into three Flight Information Regions (FIRs), from the ground to 19,500 feet and three corresponding Upper Information Regions (UIRs) from 19,500 to 66,000 feet. ENAV provides air traffic services to airspace users across the regions through 4 Area Control Centres (ACCs) and 45 Control Towers at airports.

Chart 1 sets out the locations and boundaries of the Milano FIR/UIR supported by the Milano and Padova ACCs; the Roma FIR/UIR, supported by the Roma ACC; and the Brindisi FIR/UIR, supported by the Brindisis ACC. The chart also illustrates the locations of Italy's 45 major airports.

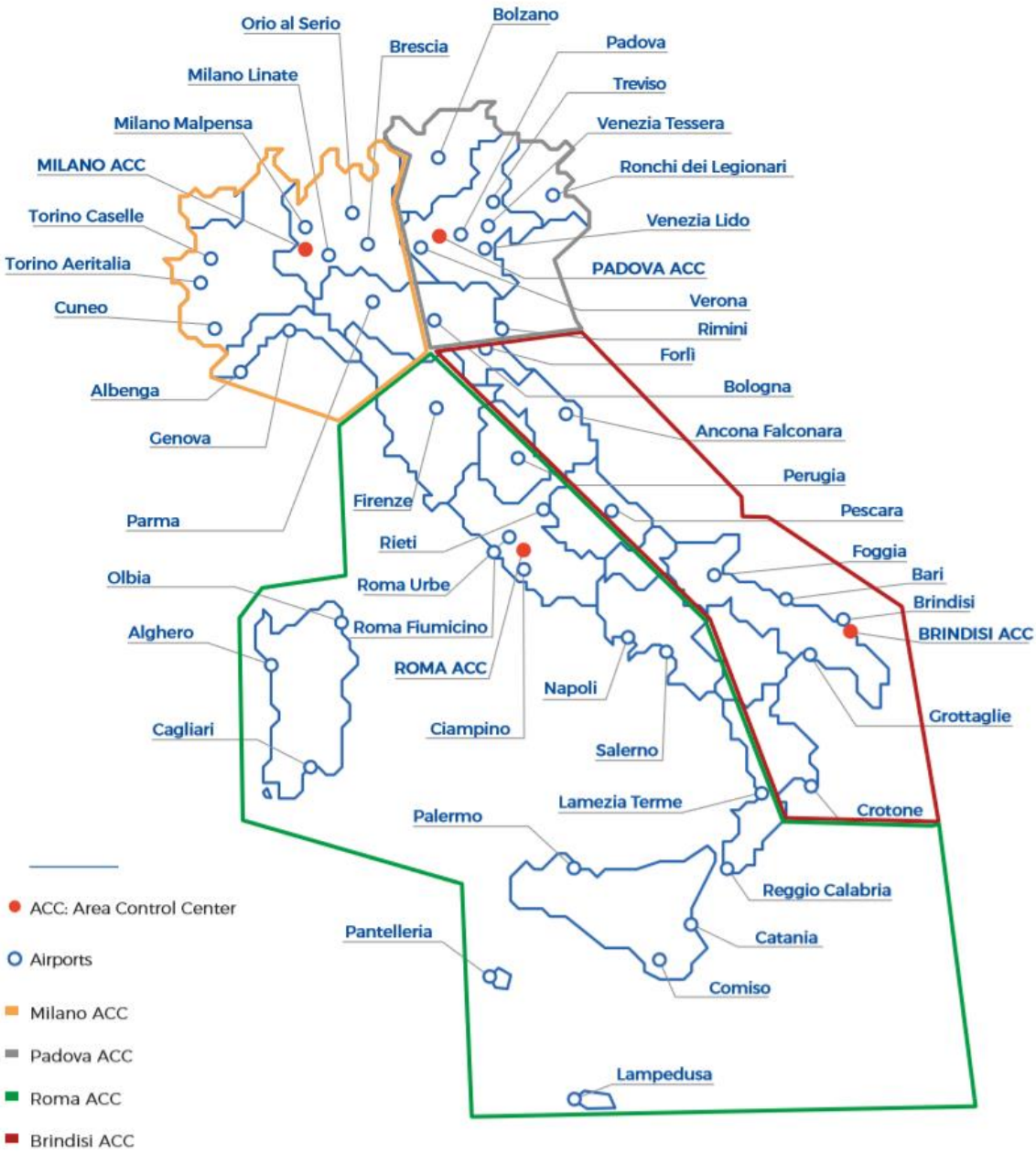


Chart 1: Italian airspace FIR/UIRs and ACCs

| There are eight main drivers for the continuous modernization of Italy's airspace

1. **Safety:** The need to deliver continuous improvements in aviation safety by reducing and removing risk factors from the existing airspace and introducing new technologies that support the safety critical tasks of pilots and air traffic controllers.
2. **Growth:** The need to accommodate the growing demand from airspace users, including commercial air transport that is a key part of Italy's transport infrastructure supporting economic growth and new fast-growing user groups such as drones.
3. **Punctuality:** The need to tackle hotspots of congestion within the current airspace network.
4. **Resilience:** The need to continuously improve the resilience of the airspace network to bad weather and other forms of disruption, including mitigating the impact of disruptions in neighbouring European airspace.
5. **Environment:** The need to develop new policies and operational approaches to better manage the environmental impacts of aviation, especially aircraft emissions and noise per flight.
6. **Technology:** The need to coordinate the introduction of new technologies and the operational concepts they enable in a synchronised way across all affected stakeholders.
7. **Airport integration:** The need to enhance the performance of Italy's core hub airports by sharing information that aligns operations on the ground more closely to the flow of traffic in the air.
8. **European integration:** The need to implement internationally agreed requirements set out as part of the SES initiative that are designed to increase the overall safety, capacity and efficiency of European airspace.

This strategy describes a range of airspace modernization initiatives that address these drivers, including:

- Replacing the fixed route structure in the upper airspace with the Free Route Airspace (FRA) concept, allowing aircraft to follow optimised flight paths without restrictions.
- Redesigning the busy terminal airspace using more precise and flexible routes, based on satellite navigation standards.
- Deploying new ATM concepts that stream traffic using speed controls to improve arrival and departure punctuality and reduce delays.
- Redesigning airport arrival and departure routes so flights can climb and descend continuously, reduce fuel burn, emissions and better manage the impacts of aircraft noise.
- Connecting airports into the network to provide and receive accurate information about traffic flows which will better manage ground delays and pinch points across the airspace.

1.2 Vision and benefits

| Vision

The Italian NAS aims to align all aviation stakeholders, including airports, aircraft operators, Air Navigation Service Providers (ANSPs), the Military, Regulator and the Government behind a common vision, to deliver:

"A safe and efficient Italian airspace that has the capacity to meet demand, balances the needs of all users and mitigates the impact of aviation on the environment"

The Italian NAS encourages aviation stakeholders to contribute to the achievement of the vision through their commitment to:

- Continue to seek improvements in the airspace structure and route network design to provide the capacity for growth alongside enhancements to environmental performance.
- Continue to seek improvements in ATM operations and technology that enhances the safety, security and efficiency of air travel in Italy and across its borders.
- Continue to support close cooperation across the sector to implement the initiatives to an optimised scope, sequence and timeline that maximises the benefits.

| Benefits

For passengers, the benefits of the airspace modernization are clear. Fewer flight delays and service disruptions at short-notice are expected to save time and improve the passenger experience.

For aircraft operators, the airspace structure is a key determinant of costs, punctuality and environmental performance. More direct and efficient flight paths will mean lower costs for operators because they will save on fuel and be able to enhance the utilisation of their aircraft.

For airports, the greater integration of their ground operations with airborne traffic flows is expected to improve runway throughput and resilience.

For the economy and consumers, the capacity to add routes and accommodate new flights will lead to better value, more choice and enhanced global connections that can help drive the economy forward.

For the environment, Although there will be environmental impacts associated with the growth in traffic levels (see section 1.3), important environmental improvements are also expected from the airspace modernization as aircraft can follow more fuel-efficient routes, climb sooner, descend quieter and navigate more accurately around populated centres.

1.3 Airspace and the environment

Aviation brings significant benefits to the economy and society, but these benefits come with an environmental cost, both at the local and global level. The government and aviation sector have important roles to play in ensuring that the results of airspace modernization are sustainable and enables improvements in environmental performance. The government's role in managing environmental impacts includes setting a policy framework which encourages industry to address key issues, funding new research and development, shaping global agreements, and developing appropriate regulation where it is needed.

The Italian NAS aims to provide clear direction for industry stakeholders to build on the progress already made and ensure that Italy leads the way in exploiting opportunities to better manage environmental impacts.

| Aircraft noise

One of the most important environmental impacts associated with the airspace at lower altitudes concerns the effects of aircraft noise. Overall, airspace modernization is expected to see a reduction in the average noise levels per flight, but the redistribution of noise impacts between different areas may often lead to disruption for communities living under flight paths.

The effects of new, more frequent or concentrated noise may increase the risks of causing general annoyance, sleep disturbance, lower levels of productivity and health impacts.

Aviation noise performance has improved significantly in recent decades driven by the introduction of quieter aircraft. However, some communities experience more noise due to the continued growth in traffic levels. The government's policy on aviation noise is to limit and, where possible, reduce the number of people significantly affected.

Many in the aviation industry believe that noise has contributed more than any other factor to the lack of investment in airspace modernization at low altitudes across Europe in recent years. Where European airports have introduced new flight paths to accommodate traffic growth and offer new connections, local protests have become common.

The widespread introduction of routes based on satellite navigation can bring more intense levels of aircraft concentration and therefore noise. Satellite navigation also offers the opportunity to deploy new operational techniques that can improve the management of aircraft noise, for example by introducing multiple flight paths for noise dispersion or respite.

The Italian NAS encourages these techniques to be deployed wherever feasible, taking into account local circumstances and preferences in determining which options should be explored. Some of the techniques involve trade-offs with other NAS objectives such as increasing airspace capacity and saving emissions, which will need to be factored into the decision-making process through wide spread consultation with stakeholders (explained in Part 3 of the Strategy).

There are four main techniques for improving the management of aircraft noise as part of the airspace modernization process – traffic dispersion, traffic concentration, noise respite and noise redistribution.

Traffic dispersion refers to air traffic control instructing departing traffic to follow the same general routing but fly a variety of different flight paths when measured over the ground.

Traffic concentration is the opposite of dispersion and is a consequence of the accuracy of routes designed to satellite-based navigation standards. Aircraft are instructed to follow the same routing consistently and fly very similar flight paths over the ground. The accuracy and predictability associated with satellite navigation means it is possible to make a more efficient use of airspace and add capacity by allowing large volumes of traffic to route through smaller blocks of airspace potentially avoiding population centres. The obvious costs of concentration, however, fall to the minority of people that are affected by more intense noise impacts.

Noise respite involves greater planning and predictability of noise impacts. For example, the planned use of different runways at different times of day, providing communities with predictable relief from the noise impacts of departures from either runway. Another example could be alternating between multiple departure routes to a pre-planned schedule. Respite can be designed into airspace structures more easily once arrival and departure routes are upgraded to satellite navigation standards.

The upgrade of arrival and departure routes at lower altitudes using satellite navigation offers more flexibility than the conventional ground-based alternatives. This allows flight paths and the associated noise impacts to be re-distributed away from noise sensitive areas. Of course, this assumes that there is an adjacent area that is less sensitive to noise that the flight paths can be moved over. The relative noise sensitivity of areas is difficult to estimate and must be carefully considered where re-distribution is the aim.

1.4 Progress update

Key organisations from across the Italian aviation sector are already investing significantly in airspace modernization initiatives to meet the growth in demand for flights, whilst enhancing safety, resilience and environmental performance. In recent years, many significant projects have been implemented, and others are being developed by the ANSP, Airlines and Airports working in close collaboration.

| Key ANSP led modernization projects

ENAV have led the implementation of several major airspace modernization projects in recent years, including:

- Replacing the fixed route network above c.30,000ft with the Free Route Airspace concept that allows aircraft to follow optimised flight paths.
- Improving Free Route Airspace (FRA) through the implementation of a new ATM System allowing greater flexibility, enlarging the scope of FRA in terms of regional application and the evaluation of a possible lowering of the level of FRA application.
- Introducing new airspace structures and re-classifying others to enhance safety by simplifying the overall airspace design.
- Deploying a more advanced communications solution for air traffic controllers and pilots, known as Controller-Pilot Data Link, which reduces voice communications by sharing standard messages in text.
- Developing a more powerful Flight Data Processing system for air traffic controllers, known as Co-Flight, working in collaboration with the French ANSP.
- Introducing the first set of Remote ATC Tower solutions at key airports that allow traffic to be managed more efficiently offsite from a dedicated centre.
- Deploying new arrival and departure routes designed using satellite navigation standards known as Performance-based Navigation (PBN) in the controlled airspace that serves all major Italian airports.
- Deploying Arrival Management Solutions to support the Rome and Milan terminal airspace by streaming inbound traffic flows efficiently using target times over specific planned points and speed controls.
- Implementing more efficient forms of airborne holding, known as Trombones or Point Merge, to support Rome Fiumicino, Milan and Bergamo airports.
- Upgrading aeronautical information systems used by ANSPs, airports and aircraft operators to share important data, like flight plans and airspace restrictions, with greater accuracy, efficiency and reliability.

| Key airport led modernization projects

Italy has recently invested in building a completely new airport hub at Milan Malpensa Airport that has increased capacity and improved services in a previously constrained region. New infrastructures and systems together with the plans to further expand Malpensa and the country's other main hub, Rome Fiumicino, aim to capitalise on Italy's strategic position for global air travel in the central Mediterranean and to better serve other domestic hubs with integrated ground transport.

Aeroporti di Roma (ADR) and Società Esercizi Aeroportuali (SEA) that operate Rome Fiumicino and Milan Malpensa and Linate respectively have invested in new concepts and technologies like:

- Airport Collaborative Decision Making (ACDM) that integrates the key systems used to support airport operations into one easily accessible and reality updated platform; and
- Integrated Airport Operations Plans (iAOPs) that establish a single, common and collaboratively agreed rolling plan available to all airport stakeholders and the European Network Management, and whose purpose is to provide common situational awareness that forms the basis upon which stakeholder decisions relating to the optimisation of airport operating plans can be made.

The development and growth of low-cost carrier traffic in Italy and the need for legacy carriers to open up new markets has contributed to significant traffic growth at other Italian airports such as Bergamo, Venice, Naples, Catania and Palermo, thus bringing the need of systems integration and modernization operating plans to these airports as well.

| Key airline led modernization projects

Alitalia, the largest Italian airline operator, has been involved in airspace modernization projects, through its Fuel Management Department, to improve flight efficiency and lower aircraft emissions. The projects focus on reducing onboard weight, improving engine efficiency, aerodynamic improvements to airframes, reducing auxiliary engine consumption and flight planning improvements. The airline is also progressing a fleet renewal programme to modernize its fleet, enhancing the aircraft's ability to benefits from improvements to the airspace and ATM network.

PART 2: INITIATIVES

Modernizing the upper airspace

Modernizing the terminal airspace

Improving the flexible use of airspace

Communications, navigation & surveillance

Air traffic management systems and tools

Resilience and business continuity

This section sets out the main initiatives planned to further support the modernization of the Italian airspace and describes the expected performance improvements. Important technical concepts, systems and standards that enable the modernization initiatives are also described in this section.

Some initiatives are more advanced compared to the general progress made by States in the SES ATM Research (SESAR) Demonstration and Deployment initiatives. An appropriate interface will be maintained to ensure the Italian experiences are shared with the central SESAR programme and other States for the benefits of the wider SES initiative.

2.1 Modernizing the upper airspace

The Free Route Airspace concept has been developed in close collaboration with ENAV, the airline community and their Flight Plan System Providers. The FRA concept describes how Free Route Airspace has been introduced into the Italian airspace and will be progressively refined in the line with SESAR Deployment projects to better integrate traffic in the en-route phase of flight using the upper airspace across Europe.

| The Free Route Airspace concept

Aircraft often fly further than necessary in the en-route phase of flight, following routes that are determined by a fixed structure of way points, rather than the shortest, most direct track to their destination. Most of the way points are based on the position of ground navigation beacons. A range of factors determine the sequence of way points that aircraft follow, including weather conditions and the location of segregated areas reserved for military activities.

The capacity and resilience of the upper airspace is largely determined by the ability of air traffic controllers to safely manage the flow of traffic through the fixed way points in each sector. Flow restrictions are applied to sectors when the volume of traffic exceeds a level that the controllers can manage safely. The restrictions can create bottlenecks which cause aircraft to be delayed or re-routed onto longer flight paths.

The goal of Free Route Airspace is to remove the fixed structure of way points in the en-route portion of Italian airspace, enabling aircraft to fly as close to their preferred trajectory as possible. Aircraft will use satellite navigation to route directly between the most efficient combination of Free Route Airspace entry and exit points. Traffic can plan and re-plan routes through large volumes of airspace without the restrictions that come with following the established structure. Flights in Free Route Airspace remain subject to the monitoring and direction of air traffic control.

| Benefits of Free Route Airspace

Free Route Airspace provides aircraft with the flexibility to flight plan and fly the shortest, quickest, most efficient routes during the en-route phase of flight. Air traffic controllers can manage larger volumes of traffic by removing the restrictions created by a limited number of fixed way points. Introducing a large array of potential flight paths through the en-route also increases the options available to traffic that must route around poor weather or segregated airspace. These improvements are expected to generate the following benefits:

- Additional Airspace Capacity: Created by removing fixed way points and enabling controllers to manage more flights through the same sectors.

- Greater Flight Efficiency: Created by the flexibility to flight plan and fly more direct routes at more efficient altitudes and speeds than available when following fixed way points.
- Safety Enhancements: Generated by the additional airspace capacity that reduces the risk factors associated with traffic congestion and peaks in controller workloads around pinch points in the fixed structure.
- Greater Resilience: Created by the flexibility to plan and re-plan flight paths in response to poor weather, disruption in other State's airspace and segregated areas.
- Cost savings: Created by optimised airline flight plans resulting in aircraft carrying and burning less fuel and greater engine efficiency.
- Environmental Improvements: Created by the reduction in Green House Gas emissions linked to the fuel burn savings.

| Free Route Airspace Implementation

Free Route Airspace in Italy has been deployed in line with the Implementing Rule set out in the SESAR Pilot Common Project (PCP), which instructs all European States to remove fixed way points in the en-route before 1st January 2022. Italy is the first European State to implement Free Route Airspace – the result of a two-year programme led by ENAV, working in close collaboration with airspace users, including Alitalia.

All aircraft within Italian airspace above Flight Level 305 (c.30,000ft) can follow a user defined, optimised flight path without having to refer to fixed way points. Free Route operations are available for overflights as well as for arriving and departing traffic.

Free Route Airspace has been implemented simultaneously in Italian and Maltese airspaces as part of a joint cross-border initiative known as the BLUE MED Function Airspace Block (FAB). This achievement was made possible through the continuous coordination with the European Network Manager in EUROCONTROL to share and validate the new Free Route concept of operations.

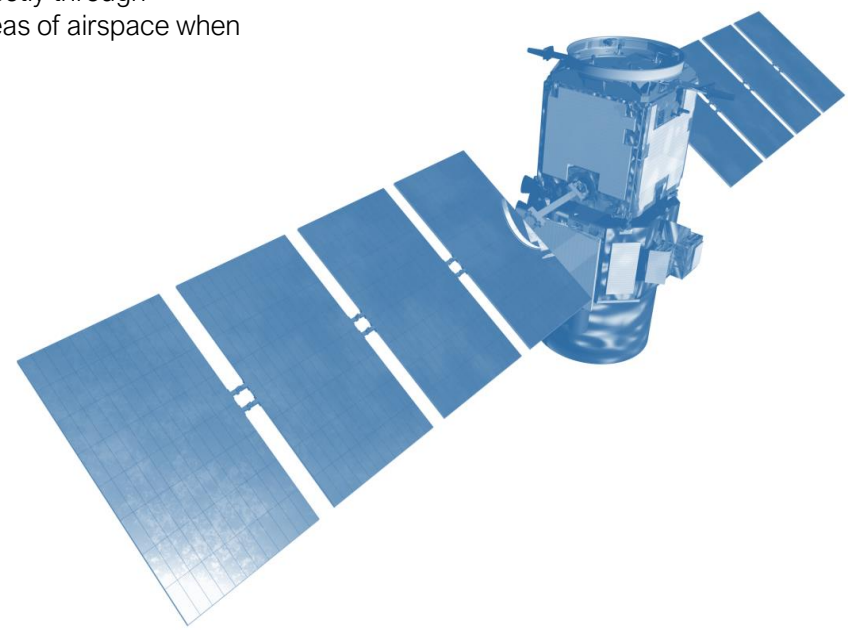
Airspace users are working closely with their Flight Plan System Providers and ENAV to ensure that the benefits of Free Route Airspace are maximised, and any implementation issues are managed. Detailed progress of the Free Route Airspace implementation activities is reported through the SESAR Deployment Manager (DM) and consultation performed through the SESAR DM Stakeholder Consultation Platform.

| Free Route Airspace Enhancements

The plans to further enhance Free Route operations in Italian airspace are aligned to the SESAR Deployment Programme and summarised in the points below:

- Free Route operations are expected to improve with the implementation of a new ATM toolset known as '4Flight' that helps controllers to maximise free route performance at a regional level.

- The vertical limit of Free Route Airspace in Italy, initially set above FL335 in December 2016, has been lowered to FL305 from May 2018, increasing the volume of airspace in which users can realise benefits. It is expected that the 4-FLIGHT ATM system will enable the evaluation of a further lowering of the vertical limit (see section 2.5).
- ENAV is working closely with neighbouring ANSPs to fully integrate Free Route Airspace across State boundaries. Integration is coordinated through the BLUE MED FAB initiative with Malta, Greece and Cyprus and through trans-FAB coordination with Switzerland, Germany and France.
- A review of Conditional Direct Route (CDR) classifications that allow civil traffic to fly directly through segregated areas of airspace when they are not being used following the implementation of military areas with high flexible use.
- Further network optimization measures based on traffic demand information and harmonization with the new Route Availability Document (RAD) implementation.
- Re-Classification of military areas above FL305 in the Airspace Management Cell (AMC) and application of Airspace Use Plan (AUP) and Updated Use Plan (UUP) process for Airspace Management.



2.2 Modernizing the terminal airspace

The plans to modernize the busy terminal airspace that supports Italy's larger hub airports have been developed in close collaboration with the ANSP, key airport operators and airspace users. The modernization of terminal airspace is based on the widespread adoption of PBN arrival and departure routes designed to satellite navigation standards and the implementation of Arrival Management solutions that together aim to systemise the route network and generate significant safety, capacity, efficiency, resilience and environmental performance benefits.

| Terminal modernization concept

The terminal airspace from around 25,000ft and below is designed to manage high volumes of traffic climbing and descending between individual airports and the en-route phase of flight.

The frequency and complexity of the interactions between traffic flows in the terminal airspace can lead to some users flying longer tracks and interrupt continuous climbs and descents. The workload placed on controllers to manage high numbers of crossing traffic can also become a limitation on the capacity and efficiency of the terminal airspace and the resilience of operations to disruption.

Terminal airspace modernization is based on the widespread adoption of new PBN routes designed to satellite navigation standards that remove the reliance on ground-based navigation aids and allows the route network to be fundamentally upgraded with greater precision and flexibility.

| Arrival Management concept

Flights inbound to busy areas of terminal airspace are often subject to congestion that results in queuing and delays. In today's airspace, arrival queues are managed on a 'first come, first served' basis using airborne holding patterns. The use of holding patterns to manage arrival queues, limits the capacity of terminal airspace, burns extra fuel, and can increase noise disturbance. Departures can be kept at lower altitudes to avoid arrival traffic in holding patterns and in doing so fly longer and potentially noisier routes.

The main objective of Arrival Management (AMAN) is to absorb delays both in the en-route and in the initial descent phases of flight using speed controls and target times to overfly specific points, removing the need for holding in the terminal airspace. ENAV plans to deploy the AMAN solution to support some of Italy's busiest airports, as well as the nation's four area control centres located in Rome, Milan, Padua and Brindisi.

| Terminal modernization implementation

ENAV has been working closely with the airports and airspace users to enhance the performance of the terminal airspace in Italy following a continuous process of review and improvement.

Terminal airspace modernization programmes are being implemented to serve flights to and from the Rome and Milan areas, including routes that serve Fiumicino, Ciampino, Malpensa, Linate and Bergamo airports. The programmes will redesign the airspace structure, including PBN Standard Instrument Departures (SIDs) and Standard Terminal Arrival Routes (STARs). A more advanced route structure designed to satellite navigation standards will be deployed to improve the linkages between northern and southern Italy, the Mediterranean islands, Northern Europe, North America, the Middle East and Asia.

Parts of the Rome terminal airspace programme were delivered into operation in May 2017, focusing on the introduction of a linear hold (or trombones procedure), with further plans to ensure benefits are fully realised. The Milan terminal airspace programme is planning to deliver a similar concept from March 2019. These programmes represent the most significant opportunity to introduce additional airspace capacity and improve the performance of the Italian airspace, as described in the benefits statements set out opposite.

| Terminal modernization benefits

Additional Airspace Capacity: by implementing more closely spaced arrival and departure routes to individual airports that are separated by design and no longer require controllers to intervene tactically to manage interactions.

Greater Flight Efficiency: by designing routes with greater precision and flexibility, reducing track miles and increasing the potential for continuous climbs and descents.

Safety Enhancements: by reducing and/or removing risk factors from the terminal operation, for example by designing out traffic pinch-points and unnecessary route interactions.

Greater Resilience: Additional capacity and the introduction of dedicated routes for each airport will strengthen the resilience of the operation to poor weather and other forms of disruption.

Environmental Improvements: The precision and flexibility of PBN routes creates opportunities to reduce emissions and better manage noise impacts, for example by designing flight paths that avoid population centres and deploying multiple route options to be used at different times there by enabling some dispersion of traffic flows. These opportunities must be balanced against the challenges created by more precise routes that concentrate aircraft noise into narrower contours, which often have a more intense impact on those areas that are affected.

| Airport engagement

The airports are responsible for managing the effects of terminal airspace modernization on their local communities. Chart 2 highlights 10 of Italy's largest airports that have been identified by the government as core to the Trans-European Transport Network (known as TEN-T). These airports are also listed by size, in terms of 2017 annual passenger numbers below:

Airport	# pax (m)
Rome Fiumicino	40.9
Milan Malpensa	22.1
Milan Bergamo	12.3
Venice Marco Polo	10.3
Milan Linate	9.5
Naples	8.5
Bologna	8.1
Palermo	5.7
Turin	4.1
Genoa	1.2

The ten core airports are expected to have the most engagement in terminal airspace modernization programmes. A further 22 airports that form part of the wider or 'Comprehensive' Italian Transport network are also included in Chart 2 and are expected to engage in airspace modernization initiatives to support their individual master plans and mitigate external environmental impacts.

The At lower altitudes, the impact of aviation on those on the ground takes greater precedence. Some airports may choose to replicate their existing arrival and departure routes with satellite-based upgrades to minimise any changes in the established patterns of aircraft noise. However, the track keeping precision of satellite navigation typically concentrates aircraft noise into narrower contours, which often have a more intense impact on the areas affected.

Other airports may choose to go beyond simply replicating flight paths and use the precision and flexibility of satellite navigation to offer more noise abatement and respite options to local communities, or deploy multiple departure routes that can increase runway throughput during peak times.

The flight paths being integrated through the terminal airspace modernization programmes are being considered based on the best balance of airborne, airport infrastructure and navigation technologies, adapting to the traffic throughput demands in the context of the national transport network.

Chart 2: Core (TEN-T) Italian Airports and the Comprehensive Network

| Airport infrastructure development

A Master Plan has been defined, outlining the foundations of long-term development of Rome Fiumicino airport. The first phase includes the completion of the airside and terminal infrastructures inside the current boundary and a first expansion to the north area through new land acquisition to realize a new runway (the fourth runway), supporting the increase in capacity by over 50 million passengers a year by 2023.

The second phase of expansion to the north will include further aircraft aprons, the fifth runway, diversion from local obstacles, new system of taxiways to ensure smooth and efficient air traffic flow, and extended terminals. Upon completion of the Master Plan, the overall capacity is expected up to 100 million passengers per year. The objective is to provide the Mediterranean with a modernized and competitive European hub, whilst enabling solutions to improve the local environment and efficiencies to the airspace users.

Milan Malpensa Airport is also progressing with runway and terminal expansion to enable optimisation with the projected movements and improve the passenger experience. This will serve the local Lombardy region as well as integrate with the country's capacity enhancements, whilst integrating with the concentrated European production and consumption area between London, Ile de France, Baden Baden-Wurtemberg, Rhone Alpes, Catalunia and the Milan region.

Fuel savings (and therefore CO2 emissions and costs) per flight are also realised through reduction of auxiliary engine consumption. Alitalia has implemented changes to reduce auxiliary engine consumption on the ground by using alternative lower consumption power generators.

At Venice airport important investments are underway both on the terminal and land side expansions to cope with double digit traffic growth, and runway optimization and re-paving with new improved RET and taxiways to maximize movements per hour.

2.3 Improving the flexible use of airspace

This section describes how new processes and information management tools are being deployed to continue to improve the integration of segregated volumes of airspace that are managed flexibly for Military and Civil use.

| The Flexible Use Airspace Concept

Some areas of Italian airspace are segregated for essential military activities like training and weapons testing. The military reserve the airspace temporarily and hand it back for civil use when it is not required. The process of temporarily booking and handing back segregated areas that are shared between civil and military users is known as Flexible Use Airspace (FUA).

The concept of modernizing the systems and processes used to manage FUA is known as Advanced FUA (A-FUA). Similar to the Free Route Airspace concept, the goal of A-FUA is to enable airspace users to fly as closely to their preferred or optimised flight path as possible without being restricted by areas that can be temporarily segregated. A-FUA also allows Military users to book and release segregated areas efficiently to best meet their training and mission requirements.

The current and future deployment of A-FUA in Italy is aligned to the SESAR programme.

A-FUA relies on the deployment of new airspace management (ASM) tools that communicate changes in the status of segregated areas across operational stakeholders more dynamically. Civil and military ANSPs follow new processes to manage the booking and release of segregated areas using the more accurate information provided by ASM tools. A-FUA information is also shared with civil and military airspace users and the Network Manager so that they can optimise their plans accordingly.

ENAV, the Italian Ministry of Defence, the Italian Air Force and ENAC are working together to further strengthen the technology and processes used for reserving and dynamically releasing segregated areas. Tools to support the digital reservation and release of segregated airspace have been implemented along with a roadmap for their further development. The roadmap includes:

- The development and implementation of civil ATC systems that display activation and de-activation information for all segregated airspace reservations and continuously assess the impacts on the wider network.
- Upgrades in Military operations centres to deploy new electronic tools that share airspace usage information with operational stakeholders.

| Benefits of improving FUA

Improvements to the processes and tools that support FUA are expected to generate the following benefits in the Italian airspace:

- Additional Airspace Capacity: by maximising the opportunities for civil users to flight plan and fly through segregated areas when they are not being used, allowing air traffic controllers to manage more flights through the same sectors.
- Safety Enhancements: by adding airspace capacity that reduces the risk factors associated with traffic congestion and peaks in controller workloads and by better information about airspace usage that reduces infringements by civil users into segregated areas.
- Greater Flight Efficiency: by the flexibility for civil users to flight plan and fly more direct routes through segregated areas when they are not being used, reducing flight times and track miles.
- Greater Resilience: by the flexibility to plan and re-plan flights through segregated airspace that are not being used to avoid poor weather and at times of disruption.
- Environmental Improvements: by the reduction in Green House Gas emissions linked to the fuel burn savings.

2.4 Communications, navigation & surveillance

The Italian communications, navigation and surveillance (CNS) strategy focuses on the transition from primary radars, radios and ground navigation beacons to satellite-based and datalink technologies.

The transition from predominantly ground-based CNS infrastructure to satellite-based capabilities is a key enabler for other airspace modernization initiatives – especially in the upper airspace and terminal areas. In the near term some ground-based infrastructure will need to be retained for defence, security and resilience purposes. This infrastructure is managed by ENAV to provide comprehensive oversight of assets. In the longer term the expansion of satellite-based services will help mitigate the risk of single-source failures associated with the transition to satellite-based technologies and enable a further rationalisation of ground assets.

| Communications

New technology is expected to change the method of communication to allow greater volumes of information to be shared faster and more consistently via datalink transfer, with less reliance on voice exchanges over radio.

Radio-frequency spectrum is an asset in high demand, mainly due to the growing usage from the mobile telecoms industry. Airspace modernization is increasing the volumes of data that are regularly transferred between aircraft and air traffic services, placing greater pressure on the radio frequency spectrum that is to communicate most data. A cross industry plan for the efficient use of spectrum is therefore required to ensure aviation needs are understood and reflect a real-time requirement for the safe operation of air operations that can contribute to the ambition of an integrated airspace.

The introduction of datalink services in Italy as from March 2018, follows the European and International ambition that aims to drive the reduction in voice communications and support a more consistent, reliable and less workload intensive exchange of information. Initially datalink solutions are being used to replace standard air traffic message exchanges, with more complex interactions developing as experience is gained.

| Navigation

The avionics capability of the aircraft fleet has advanced significantly in the past two decades, allowing a shift from the reliance on ground-based navigation beacons to autonomous aircraft operations dependent on a satellite-based navigation source.

The adoption of EU reg. 2018/1048 (the PBN Implementing Rule) in July 2018 has defined the European objectives and strategy to migrate towards a PBN airspace based on GNSS as the main navigation infrastructure. The regulation foresees the implementation of RNP APCH 3D approaches for all Instrument Runway Ends in two stages (by 2020 and 2024), RNAV 1 in the terminal airspace in two stages (by 2024 and 2030) and RNAV 5 for the enroute airspace (by 2020 and 2024). The Italian NAS is aligned to the European objectives and at times aims to deliver changes in advance of the dates fixed by the regulation.

The PBN IR requires a complete PBN network developed by 2030, reliance on GNSS and the elimination of conventional navigation procedures. The related rationalization of ground-based assets and the transition to a satellite based navigation infrastructure is expected to provide:

- an affordable airspace modernization approach for smaller aerodromes that have less air traffic control technology and equipment.
- an alternative to non-precision approaches (NPA) that are safer and more efficient.
- a back-up to current precision landing systems to enhance resilience.

ENAV has started different initiatives supporting GNSS use, including the development of GNSS performance assessment systems and the implementation of rotorcraft routes for HEMS based on GNSS.

ENAC, ENAV and Alitalia have established a task force to deliver new Performance-based Navigation routes, supported by GNSS into Italian airspace. The task force aims to ensure that all non precision approaches to Italian runways are replaced with Approaches with Vertical Guidance as a priority.

In alignment with the increasing introduction of PBN routes in Italy, a progressive rationalization of existing ground navaids is expected to take place. ENAV has already established a plan for NDB removal, allowing their withdrawal while maintaining VOR/DME and DME/DME as a back-up for GNSS based routes.

| Surveillance

The application of space-based navigation and improved communication links will allow users to transmit precise positional information to ATC, increasing both ground and airborne situational awareness. It is recognised that a primary surveillance capability (i.e. radars) will be required for the foreseeable future, at a minimum to support defence and security objectives. However airspace modernization offers the opportunities to enhance surveillance capabilities in the air and on the ground by:

- Increasing the uptake of aircraft broadcast position information and availability of portable technology, allowing an affordable option for all aircraft operators (Civil, Military and General Aviation) to share electronic surveillance information with one another; and
- Developing and deploying new technologies and equipment for ANSPs to gather, process and display aircraft position information from multiple sources.

ENAV is part of the Aireon joint venture, which is providing technology that will expand air traffic surveillance through satellite based ADS-B rather than ground receiver antennas. Iridium Communications, NAV CANADA, the Irish Aviation Authority (IAA) Naviair, and NATS are also part of the Aireon project.

| Surveillance and safety enhancements

One of the areas of greatest concern in uncontrolled airspace is the risk of mid-air collision where military, General Aviation and a small volume of commercial traffic are operating in a 'see and avoid' environment with limited air traffic services and surveillance coverage. Each operator has responsibility for maintaining its own visibility and keeping a lookout for aircraft in order to avoid them.

The widespread adoption of electronic surveillance solutions that make all aircraft more visible is needed to maintain high safety standards in uncontrolled airspace, especially around smaller aerodromes that have no surveillance capability themselves and in areas with a high density of airspace users that may be harder to see with the naked eye, such as light aircraft, gliders, hang-gliders and drones.

An additional mid-air collision risk arises from airspace infringements – where an aircraft flying in uncontrolled airspace inadvertently enters controlled airspace and comes into conflict with, say, a commercial flight. Such infringements highlight the limitations and potential safety implications of the current airspace design. A simple navigational error or loss of situational awareness in a complex system, combined with a lack of uniform electronic surveillance, creates a safety concern.


067°>17.0
MEA 5000
500
IAS 230 KT
RF 4.16
1D
(ATC discretion)
157°>15
MEA 500
NETUN

2.5 Air traffic management systems and tools

The air traffic management (ATM) systems and tools section of the Strategy has been developed in line with the SESAR programme working close collaboration with ENAV, the government and the regulator. It describes how the modernization of Italy's airspace is enabled by investments in new ATM systems and tools and integrates with other related ATM investments like Remote Towers.

The continued modernization of ATM systems and tools used by ENAV will ensure airspace management decisions are informed by accurate data about when aircraft plan to depart, when they do depart or when they are expected to arrive in a sector of airspace. The benefits of many of the concepts described in sections 2.1 to 2.4 are enabled by the modernization of ATM systems and tools.

ENAV has already deployed a series of improvements to the Human Machine Interface (HMI) used by their Air Traffic Controllers. A new flight data processing system (FDPS), known as COFLIGHT, is currently being developed in cooperation with French ANSP DSNA to further enhance the HMI and introduce new advanced functions like 4D trajectory predictions.

COFLIGHT is a new generation FDPS designed to meet SES objectives and align with key SESAR functionalities. It will provide advanced functions like 4D trajectory predictions, interoperability with other systems and datalink capabilities and support current and future operational concepts like cross-border free route operations. COFLIGHT will optimise airspace usage and therefore reduce the environmental impact of aviation and improve flight cost efficiency.

A Tactical Controller Tools (TCT) have already been implemented to ENAV's existing systems to support the introduction of Free Route Airspace operations. Enhancements to the Free Route Airspace concept are supported by the upcoming introduction of a Medium-Term Conflict Detection (MTCD) tool, known as ERATO, which is being developed and deployed in Italy and France. The MTCD tool provides the en-route air traffic controller with information on conflict resolution to help with aircraft trajectory decision-making. Development of the tool has been based on live trials in France and real-time simulations in Italy. Developed by the French ANSP (DSNA) and ENAV, ERATO will be implemented in ENAV legacy systems and work with COFLIGHT, the new FDPS, in readiness for 4D trajectory predictions.

System Wide Information Management (SWIM) supports information exchanges through an internet protocol (IP)-based network. The synchronisation of data involves ENAV, Ministry of Defence, airspace users (operations centres), airport operators, Meteorological service providers and the European Network Manager. Initial iSWIM services will enable Arrival Management solutions explained in section 2.2. to connect with the new FDPS and share trajectory information between ATS units.

Advanced data exchange and sharing services are required to communicate aeronautical information (flight, weather, aerodrome, obstacles, etc) to the operational activities on the ground and in the air. The Aeronautical Information Exchange Model (AIXM) is a specification that enables the encoding and distribution in digital format of the aeronautical information. The aeronautical information management (AIM) concept is being delivered via the SESAR programme to provide more accurate and efficient digital aeronautical information to airspace users, navigation providers and airport operators. An ENAV programme is transitioning the existing AIS to the European AIS Database (EAD), which is a European central repository of quality assured data which enables the participating States to co-ordinate their aeronautical information updates and to produce and distribute their Aeronautical Information Publication (AIP) charts and Notice to Airmen (NOTAM) messages.

The use of advanced ground systems and new ANS infrastructure to optimize air traffic flows requires synchronization with aircrafts' avionics equipment. A large-scale deployment of ground systems and new SESAR deliveries must be closely coordinated with aircraft avionics upgrades.

| Remote Towers

The remote tower concept enables air traffic control services (ATS) and aerodrome flight information services (AFIS) to be provided at aerodromes where such services are either currently unavailable, or where it is difficult or too expensive to implement and staff a conventional manned facility. The concept allows for the remote provision of ATC services and AFIS for one aerodrome handling low to medium traffic volumes or two low-density aerodromes.

The basic configuration, which does not include augmentation features, is considered suitable for ATC and AFIS provision at low density airfields. However, the level and flexibility of service provision can be enhanced through the use of augmentation technology, such as an ATC surveillance display, surveillance and visual tracking, infra-red cameras etc. There is also the possibility to apply the remote tower concept as a contingency solution, known as a Remote Contingency Tower (RCT).


ELITO
427
RF41
VALMA 1E
253
MEA 5000
152°>9.5
MEA 4500
IAS 230 KT
110 80
VALMA 1E
RF41
MEA 5000
152°>9.5
MEA 4500
110 80

2.6 Resilience and business continuity

The Italian law enforces the provision of minimum service levels that cover the following forms of operation:

- All overflights
- All flights whose departure is scheduled in the time slot 07:00 A.M. – 10:00 A.M. and 06:00 P.M. – 09:00 P.M., as well as international flights arriving within a half hour from the predicted slots
- Re-positioning flights
- State, emergency, rescue and humanitarian flights
- All arriving intercontinental flights
- Intercontinental departing flights in the measure of 50% of the scheduled flights
- Daily return connections to the Italian islands

Arrangements for the protection of services during daily/holiday peak periods is also in place, enforcing that industrial actions cannot occur on the following days:

- from 18 December to 07 January
- from 24 April to 02 May
- from 27 June to 04 July
- from 27 July to 05 September
- from 30 October to 05 November
- from Thursday preceding to Thursday after Easter

from the preceding third day until the third day after the national, European and regional elections, the national referendums

from the preceding until the day after the political by-elections or the regional and partial municipal elections in the only affected areas.

The Italian law regarding strike action is among the friendliest in Europe when it comes to assuring operations continuity. The main elements of the regulation and its principles are set out below:

- A minimum notification period is 10 days (excluding the day of the strike).
- A maximum notification period is 45 days.
- A maximum duration of the strike of 4 hours for the first strike action. The second action for the same dispute is of maximum 8 hours and in exceptional circumstances 24 hours (although a 24hr strike has not occurred since the introduction of the law in 1990).

A two-step conciliation procedure is also required prior to the commencement of planned industrial action in order in order to lay down agreements between parties and therefore prevent strikes.

PART 3: IMPLEMENTATION

Coordination, oversight and engagement

Conclusion and next steps

3.1 Coordination, oversight & engagement

| European coordination

Airspace modernization in Italy forms a key part of the wider Single European Sky (SES) initiative. The SES initiative is sponsored by the European Commission and provides the overarching framework to upgrade the airspace and ATM network across Europe. The SES ATM Research (SESAR) Programme is a key strand of the SES framework that aims to develop new concepts and technologies in support of airspace modernization.

ENAV and some of Italy's larger airports have been heavily involved in the development, testing and implementation of the SESAR outputs through the Pilot Common Project (PCP).

The SESAR PCP coordinates the deployment of six core ATM functionalities (AF) that are considered essential for the modernization of airspace across Europe. It is important that the Italian NAS supports the implementation of the functionalities advocated by the SESAR PCP in the timelines required; whilst also influencing at the European level, when developments in Italy are more advanced than the PCP programme. The table below summarises the SESAR PCP ATM functionalities and some of the projects that have been implemented in Italy so far to address them (Note: it is a non-exhaustive list of projects being implemented).

SESAR PCP ATM Functionality	Italian PCP Implementation Projects*
AF1 – Extended Arrival Management and PBN in high density TMA.	Geographic database for procedure design, Extended Arrival Management
AF2 – Airport Integration and Throughput.	A-SMGCS Level 2 and Airport Safety Nets
AF3 – Flexible Airspace Management and Free Route.	Free Route Airspace Implementation in Italy above FL305. Advanced Flexible Use of Airspace.
AF4 – Network Collaborative Management.	Network Collaborative Management implementation and Traffic Complexity Tool.
AF5 – Initial System Wide Information Management (iSWIM).	Initial SWIM, Airport MET, UPM upgrade and Advanced FUA.

**Non-exhaustive list*

Some aspects of the Italian NAS initiatives outlined in section 2 are at an advanced stage compared to the general progress made by other European States in the SESAR Research, Demonstration and Deployment initiatives. An appropriate interface will be maintained to ensure Italian experiences are shared with the central SESAR programme and other States for the benefits of the wider SES initiative.

| National Coordination

In addition, and to support the European level synchronisation provided by SES and SESAR, the Italian NAS will require joint government, regulator and industry arrangements to sponsor the coordination and implementation of the airspace modernization initiatives at a national level. These arrangements should set out which organisations make decisions and have accountabilities in the strategic direction of airspace, and the stakeholders they will engage and consult with as they carry out their strategic roles.

As the strategy moves into implementation, there will be a series of industry organisations, brought together into coordinated delivery groups. These groups will be comprised of organisations involved in the delivery of the initiatives set out in section 2. As some aspects of the strategy and the initiatives in it are not yet finalised, there will be a need to retain some flexibility as to the nature of these delivery groups.

Between the delivery groups, it is proposed that there should be a Coordination Function. This function will be responsible for ensuring the initiatives in the delivery groups are brought together into one coordinated whole.

It is envisaged that the Coordination Function established to join-up the delivery groups will also provide a consultation and communications framework to ensure transparency and engagement with other industry partners and a wider mix of stakeholder groups – including the public, local communities and companies that rely on aviation to conduct their business.

The Coordination Function will bring together all industry stakeholders including aircraft operators, airports, service providers and other government interests to maintain and implement the Italian NAS. The role of the Coordination Function is expected to include:

- Development of a whole-of-industry position on the implementation of key Italian NAS initiatives.
- Assisting with coordinating the activities of all stakeholders in the implementation of the Italian NAS initiatives, monitoring progress and addressing shortcomings.
- Providing the government and regulator with well-considered strategic industry advice on airspace and ATM related matters.

It is proposed that the Coordination Function will apply the following guiding principles:

- Take into account the views of all sections of the industry, including defence, commercial, private and recreational operators and service providers, while recognizing that consensus may not always be possible due to the differing requirements and set up of the different sectors of the industry.
- Make recommendations aimed at ensuring that the Italian airspace and ATM infrastructure meets the operational needs of all sectors of the aviation community.
- Ensure that its advice is compliant with Italian obligations to European legislative and regulatory requirements.
- Ensure that its advice is consistent with Italian commitments to ICAO and other international organizations.
- Carefully consider the safety, efficiency and environmental benefits offered by each airspace modernization initiative together with industry's capacity to absorb additional costs, while recognizing the accountability and liability of each organization involved.
- Ensure coordinated and synchronised management of change across the European airspace network working in collaboration with EU institutions and other European States.
- Carefully consider industry's capacity to absorb major airspace modernization changes.

The main tasks that is envisaged will be undertaken by the Coordination Function are set out in the bullets below:

- Provide a forum for actors involved to share and coordinate integrated airspace planning, implementation costs and effort.
- Develop of a whole of industry view of what communications, navigation and surveillance systems should be capable of achieving in the short, medium and long term.
- Identify how best to incorporate and coordinate the adoption/integration of new and emerging technologies.
- Identify, and seek EU funding opportunities for any activities necessary to support the airspace initiatives.
- Develop sustainable performance cases to support optimised airspace investments.
- Conduct periodic reviews and make recommendations for the updating of the Italian NAS.

3.1 Conclusion and next steps

The first edition of the industry's proposal for an Italian NAS, produced by ENAV and IATA, in collaboration with Alitalia and Assaeroporti is an important step in the ongoing modernization of the Italian airspace.

The rapid growth in demand for aviation across Europe will become unsustainable without airspace modernization. The Italian aviation industry have joined forces to coordinate and continue the implementation of modernization initiatives at a national level, working within the framework provided by SES and the SESAR Programme.

The first edition of the Italian NAS sets out an agreed perspective from Italian industry stakeholders on:

- The strategic direction for the future of airspace in Italy.
- The main drivers for airspace modernization.
- Approaches to maximize the benefits from airspace modernization and mitigate the environmental impacts of aviation.
- Key airspace modernization initiatives for the Italian upper airspace, terminal airspace, CNS infrastructure and ATM systems and tools.
- Arrangements for coordination, engagement and oversight of airspace modernization across the Government, Regulator and Industry.

The publication of the first edition will start a period of further engagement with a wide mix of aviation, business, community and environmental stakeholders to refine the strategy and support the ongoing coordination and implementation activities.

Following this approach, future editions of the Italian NAS will be shaped by stakeholder feedback and released periodically.

From January 2019, the Coordination Function described in section 3.1 will be established to oversee the next phase of Italian NAS development and implementation. In its initial form the Coordination Function will include representatives from ENAV, Alitalia, Assaeroporti, IATA and ENAC. Other stakeholders will be invited to participate in due course. One of the Coordination Function's first tasks will be to assess existing delivery plans and policy and regulatory developments that are aligned with the NAS initiatives, examine the dependencies and identify how national level coordination can add value.

The Coordination Function will also oversee the refinement of the cost / benefit analysis that supports the Italian NAS initiatives and take responsibility for tracking the delivery of benefits for the airspace user community.