



# DEVELOPING OPTIONS FOR UPPER AIR SPACE MANAGEMENT FOR PACIFIC ISLAND COUNTRIES

TOWARDS A REGIONAL AIR TRAFFIC MANAGEMENT FACILITY

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## OVERVIEW

This brief outlines key findings from a recent study commissioned by the Public-Private Infrastructure Advisory Facility (PPIAF) in support of the Pacific Aviation Investment Program. The purpose of the study was to explore long-term options for the delivery of Air Traffic Management (ATM) services in the upper airspace over the south and central Pacific<sup>1</sup> and to establish options for greater efficiency, better management, more equitable income distribution to countries, and increased safety. The existing Flight Information Regions (FIRs) were established in the 1940s and 1950s and do not reflect modern technologies or aviation practices. The differential charging rates of current air navigation service providers (ANSPs) for travel in FIRs leads to sub-optimal routing choices by some airlines. Various operational models were assessed and it is proposed that opportunities for unifying the FIR management through a 'Regional Air Traffic Services Contractor' be explored by Governments.



*Current Allocation of Flight Information Regions (FIRs) in the South Pacific*

## Background

The oceanic upper airspace across the Pacific can be characterized by the following:

- The majority of air service providers using technologically sophisticated long-haul aircraft that seek to achieve significant operational cost savings by flying on fuel

<sup>1</sup> This applies to operations in the unified Pacific upper airspace; 11 states would provide airspace to the unified Pacific upper airspace: Tonga, Samoa, Cook Islands, Niue, Fiji, Kiribati, Tuvalu, New Caledonia, Vanuatu, Nauru, and Solomon Islands.

efficient routes that can vary on a daily basis depending on the weather and wind conditions;

- The need for ANSPs within Pacific FIRs to accommodate User Preferred Routes through ATM systems that can: (i) communicate and receive aircraft position via satellite, (ii) assist controllers identify and resolve conflicts between aircraft flying on random routes, and (iii) enable the exchange of data with adjoining FIRs without the need for verbal coordination; and
- The expectation that satellite technology (to become available in 2017) will enable the greater use of Automatic Dependent Surveillance – Broadcast (ADS-B) in oceanic areas and will provide complete surveillance coverage over the Pacific Ocean. The use of ADS-B (In) is likely to gain greater prominence through aircraft seeking to gain operational efficiencies by having better access to optimal flight levels.

A high degree of route flexibility, combined with the greater sophistication of airlines and ANSPs, promotes the consolidation of air traffic service delivery and thereby FIR areas of responsibility.

ATM service delivery in the upper airspace of the South Pacific is dominated by three organizations: Airports Fiji Limited (AFL), Airservices Australia (Airservices), and Airways New Zealand (Airways). AFL is responsible for ATM service delivery in the Nadi FIR, which covers Fiji, New Caledonia, Tuvalu, Vanuatu, and part of Kiribati. Airservices provides ATM services for the Nauru and Honiara FIRs. Airways provides services for Cook Islands, Niue, Samoa, and Tonga, currently within the Auckland FIR. Each operator employs different revenue allocation methodologies to provide states with a share of upper airspace revenue.

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<sup>1</sup> South Pacific Forum “Pacific Forum Airspace Management Concept Study” (1999); Asia Development Bank “Pacific Unified Air Space Management” (2001); World Bank, Flight Information Region Analysis Kiribati and Tuvalu (2013)

<sup>2</sup> It is recommended that changes to FIR boundaries over the

## Opportunities from Unification

Most of the FIRs across the Pacific are a reflection of the political and colonial influences that existed in the 1940’s and 1950’s. They are also a reflection of the aircraft performance, navigation systems, and air-routes of the time. While these historic FIR boundaries are becoming less relevant, changes to the FIR boundaries is not straight forward as it involves agreement with the International Civil Aviation Organization (ICAO) and can take some years.

Three previous studies<sup>1</sup> looked from different perspectives at the management of the upper airspace across the Pacific and in particular the potential of its unification. The potential benefits from unification are:

- **Efficiency:** Operations would reflect capabilities and routing decisions of the latest generation aircraft;
- **Equity:** Non-provider States want an equitable share of revenue from ATM services delivered to aircraft in the upper airspace above their sovereign territory;
- **Cost-Effectiveness:** Fragmentation of airspace and ATM service delivery presents the likelihood that operational costs to airline users will increase;
- **Effectiveness:** Linking the FIR revenue to funding regulatory oversight would improve the overall effectiveness of oversight and safety.

This PPIAF funded study identified three options for unification. The proposed approach can be implemented without any changes to existing FIR boundaries<sup>2</sup>.

For all options, the eleven states in the South Pacific need to agree to collectively govern their sovereign interests over the upper airspace in this region

sovereign area of Kiribati are undertaken as their sovereign territory lie within the Tahiti and Oakland FIRs. These boundary changes can take place independent of the implementation of any new service delivery arrangements. However, making these changes concurrently to implementing a new arrangement would be a feasible approach.

through a treaty. The Regional Transport Ministers Forum could provide governance of the upper airspace treaty and ATM service delivery arrangements.

## Pacific-Owned Provider (POP)

The Pacific-Owned Provider option involves the creation of an organization to provide ATM services in the unified Pacific upper airspace. Through a multilateral agreement, the states will agree to establish a company, or corporation incorporated by the states, to provide ATM services in the unified upper airspace.

The POP organization would be responsible for providing ATM infrastructure plus implementing air navigation charges and billing processes. Each state would have to execute a separate administrative agreement with the company to meet ICAO requirements and for implementation.

This option requires the greatest capital investment and has the highest establishment costs and operating expenses. This approach also requires changes to ICAO airspace delegations and may require changes to domestic laws of the nominated host country for the organization to undertake the full range of commercial activities.

Although each state will receive different levels of income, in the interests of equity, each has the same shareholding and voting rights (one vote per state) under this option.

Establishing a single commercial ATM organization in the region would ensure a level of aviation capability development for Pacific states, and presents an opportunity to expand services to cover other FIR regions in the future (e.g., Tahiti, Papua New Guinea).

## Shared ATM Provision

The Shared ATM Provision option is a modification of the current arrangement. The unified Pacific upper airspace would be split into one or two parts, and administered by one or two of the existing ATM providers. The ATM providers would provide ATM services, lead the ATM policy for this area, levy ATM charges, and collect upper airspace revenue. The key differences to the current arrangements are:

- States receive a proportionate share of income based on volume of airspace provided and traffic levels (i.e. gross charges less the agreed service fee)<sup>3</sup>.
- States would negotiate with the ANSPs over the scope of services and service fees (in the range of 20-25 percent). The selection of the ATM provider should be based on the balance between revenues charged to aircraft for services, and that returned to the individual states.
- The likely term of the agreement would be for five years.

Participating states would individually enter into an administrative agreement to delegate ATM service provision within designated areas to the ATM providers, as appropriate (the governments of the providers would assume ICAO delegations for their respective portions of the unified Pacific upper airspace).

This option may mean a loss of technical capability in the region through reduced need for air traffic controllers and technical staff. However the strengths of this option include easy and quick implementation, and low risk for states. ATM services would be provided by an existing organization(s) and all states will receive a greater share of upper airspace revenue. The ATM provider(s) are able to generate service delivery efficiencies, which will likely mean a reduction in oceanic air navigation charges for users.

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<sup>3</sup> This is the current approach for Airways New Zealand.

## Regional Air Traffic Services (ATS) Contractor

The Regional ATS Contractor option involves the States creating a commercial contest for the delivery of ATS in the unified Pacific upper airspace.<sup>4</sup> The selected contractor is responsible for providing ATM infrastructure and implementing air navigation charges and billing arrangements.

The primary benefit of the Regional ATS Contractor approach is that it establishes a commercial contest between existing ATM service providers in the region, which offers the prospect of lowering the level of air navigation service charges. Potentially, the existing ATM service providers could form a consortium for jointly bidding for the work.

The States could either create an operating company as a not-for-profit government-owned corporation incorporated in a host country (for the initial period at least), or use an existing regional organization to manage the Regional ATS Contractor. The objective of this organization is to balance income received from the ATM services with the expenses of the overseeing and managing the Regional ATS Contractor, and to deliver an agreed distribution of upper airspace revenue to the states.

## Allocating Revenue to Regulatory Oversight

Currently, the revenue received by States from upper air space is used in different ways between countries; some allocate it to general revenue while others dedicate some/all of it to the aviation sector. The funding of effective safety oversight has long been an issue in the sector. The 'Pacific Aviation

Safety Office' (PASO) was established as a regional organization to provide safety oversight services. It has also suffered from financial challenges.

It is recommended that a portion of the upper airspace revenues generated through optimized ATM provision and increased financial returns for member States be directly channeled to PASO, as an alternative funding mechanism for meeting States' financial obligations to PASO operating costs. States would receive payments from ATM providers net of their financial obligation to PASO. This would avoid States having to make payments to PASO from their general government funds, and allow PASO to be confident of future revenue thereby allowing for provision of the full range of services to States.

## Conclusion

The unification of upper airspace management through the adoption of new ATM arrangements will lead to improved efficiencies for airline operations, opportunities to rapidly leverage new technological advances, larger and more equitable distribution of upper airspace revenue to states, and the potential to improve aviation oversight through effective and regular funding for PASO. Improvements to the financial arrangements will help deliver improved aviation infrastructure and related sector services.

Each of the proposed options has strengths and weaknesses but the opportunity to move to a single Regional ATS Contractor offers the greatest potential benefits to ensure the sustainable delivery of ATM services in the upper airspace over the South and Central Pacific.

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<sup>4</sup> This was the recommended option presented in the Pacific