

## 1. Introduction

In February, ICAO established the Multi-Disciplinary Working Group (MDWG) to assess the challenges of the Aviation System Block Upgrade (ASBU) implementation from an economic perspective. The rationale behind the work of MDWG-ASBU work is to provide information to the ICAO Secretariat on how the implementation of the ASBUs can be encouraged, in particular to stimulate early investors in new concepts and technologies. This MDWG has established four sub-groups to carry out specific work.

The tasks given by the MDWG-ASBU to WG 3 are:

Schemes to finance the ASBUs implementation

1. *identification of mechanisms to support operational improvements for financing notably infrastructure and equipment.*

Among the tasks to be addressed by the MDWG is to establish an inventory of existing financing schemes. Specifically, the tasks allocated to WG 3 on schemes to finance the Aviation System Block Upgrades (ASBUs) Implementation are in the identification of mechanisms to support operational improvements for financing, notably infrastructure and equipment.

To perform these tasks the working group organized the work in three main areas:

1. Definitions and attributes
2. Inventory of financing schemes
3. Financing Criteria

This report has been prepared with the support of the Secretariat to assist WG 3 in some of its efforts to achieve its agreed deliverables to the MDWG. While the Secretariat has supported this work, the information contained in this report, must not be taken as the ICAO Secretariat's view.

## 2. Workstream 1: Existing ICAO Documentation

Extensive information already exists within a number of ICAO Policy and Guidance Material publications. The key ICAO documents relating to Airport and Air Navigation Economics are:

- 1) Doc 9082 –ICAO’s Policies on Charges for Airports and Air Navigation Services
- 2) Doc 9161 - Manual on Air Navigation Services Economics
- 3) Doc 9562 – Airport Economics Manual
- 4) Doc 9980 - Manual on Privatization in the Provision of Airports and Air Navigation Services

The existing ICAO documents already contain policies as well as high level information relating to sources of financing and funding. However, the modernization of air transport infrastructure through the implementation of ASBUs as part of the Global Air Navigation Plan (GANP) requires a significant investment at a level not seen previously. As a result, the funding and financing schemes previously outlined in ICAO material may need to be complemented to cope with the level of investment required.

At the first meeting of the MDWG-ASBU in February, ICAO presented four Information Papers outlining and summarizing the information and the ICAO position found in some of these documents (*See MDWG-ASBU Information Papers 1 and 4*).

Many of the existing ICAO policy and guidance material documents have been applied to fund and finance existing air transport systems as well as safety, security and economic oversight functions. However, there have been a number of developments in the last 10-20 years that have altered the way in which the air transport industry is financed. Most notably, the increase of private sector participation has enabled alternative forms of financing.

Some of the schemes and concepts found in this report are likely to be already defined within ICAO documentation and consequently aligned to ICAO policies. However, there may be some other concepts or schemes that may diverge from existing ICAO’s policies and guidance material. It is the understanding that Working Group 4 will carry out the work of providing inputs and suggestions to the Airport Economics Panel and Air Navigation Services Economics Panel (AEP-ANSEP) on the potential need to develop and complement ICAO’s policies and material to cope with the significant challenges associated with the modernization of the global air traffic management system.

### 3. Workstream 2: Definitions and Descriptions

Prior to identifying specific funding and financing schemes, it is important to be clear about some other terms associated with the implementation of the ASBUs. The following definitions and descriptions are more specific when discussing the implementation of ASBUs.

#### Infrastructure

An online search showed:

*Investopedia* defines **infrastructure** as: the basic physical systems of a business or nation. Transportation, communication, sewage, water and electric systems are all examples of infrastructure. These systems tend to be high-cost investments, however, they are vital to a country's economic development and prosperity.

The *Oxford Online Dictionary* defines infrastructure as: The basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise.

The term *infrastructure* has been generically used to refer to any capital intensive asset or group of assets which provide essential goods or services (e.g. utilities, petrochemicals, transportation services, housing etc) and can be contractually structured to provide internally generated cashflows.

The English-language definition of infrastructure is the basic physical and organizational structures needed for the operation of a society. Infrastructure is vital to economic growth and development and, therefore, to improving a country's general living standards, alleviating poverty, and enhancing social cohesion.

A World Bank document loosely refers to Air Transport Infrastructure to include:

- Airport Infrastructure
- Air Navigation Services (ANS) Infrastructure (air traffic control)
- Safety Oversight (technical regulation)

A more detailed description is that Air transport *infrastructure* provides nodes in a network of domestic and international air links that is vital for the delivery of air transport. It includes the physical structures, namely, airports (runways, terminals, etc.) and air traffic control (ATC) centers or towers, and the organizations involved in coordinating their provision and use. Without air transport infrastructure, air transport cannot function, and without a well-functioning air transport system and the international linkages it provides, national markets will be smaller and some markets may not even exist, particularly for landlocked, isolated, and low-population-density countries (World Bank 2005).

Generally when discussing infrastructure, it is important to note that while fixed costs are generally high and considered to require major investments, infrastructure typically has long life cycles.

## Equipment

The *online Business Dictionary* defines **equipment** as tangible property (other than land or buildings) that is used in the operations of a business. Examples of equipment include devices, machines, tools, and vehicles.

*The online Oxford Dictionary* defines **equipment** as the necessary items for a particular purpose.

In terms of aviation and specifically in terms of the ASBUs, infrastructure refers to the air traffic management (ATM) ground or satellite systems used to operate and manage air traffic as well as the airport groundwork and systems that enable aircraft to whereas equipment refers to aircraft systems necessary to operate a flight.

## Equity

The definition of equity capital provided in the glossary of terms shows that **Equity capital**. Money furnished by the owner(s) of the entity.

*The online Business Dictionary* defines **equity** as: ownership interest or claim of a holder of common stock (ordinary shares) and some types of preferred stock (preference shares) of a company. On a balance sheet, equity represents funds contributed by the owners (stockholders) plus retained earnings or minus the accumulated losses. (2) Net worth of a person or company computed by subtracting total liabilities from the total assets. In the case of cooperatives, equity represents members' investment plus retained earnings or minus losses.

*Investopedia* lists **equity** as:

1. A stock or any other security representing an ownership interest.
2. On a company's balance sheet, the amount of the funds contributed by the owners (the stockholders) plus the retained earnings (or losses). Also referred to as "shareholders' equity".
3. In the context of margin trading, the value of securities in a margin account minus what has been borrowed from the brokerage.
4. In the context of real estate, the difference between the current market value of the property and the amount the owner still owes on the mortgage. It is the amount that the owner would receive after selling a property and paying off the mortgage.
5. In terms of investment strategies, equity (stocks) is one of the principal asset classes. The other two are fixed-income (bonds) and cash/cash-equivalents. These are used in asset allocation planning to structure a desired risk and return profile for an investor's portfolio.

## Debt

The online source *Investor Words* defines **debt** as: an amount owed to a person or organization for funds borrowed. Debt can be represented by a loan note, bond, mortgage or other form stating repayment terms and, if applicable, interest requirements. These different forms all imply intent to pay back an amount owed by a specific date, which is set forth in the repayment terms.

Debt is borrowing money from an outside source with the promise to return the principal, in addition to an agreed-upon level of interest. Although the term tends to have a negative connotation, startup companies often turn to debt to finance their operations. In fact, even the healthiest of corporate balance sheets will include some level of debt. In finance, debt is also referred to as “leverage.”

## Funding and Financing explained

Financing and funding are two terms that have been used interchangeably yet there are some clear and distinct differences that need to be outlined; especially when discussing infrastructure and equipment in the aviation and ASBU context.

An online search for a general definition of funding showed:

*Merriam-Webster's online dictionary* defines **funds** as: an amount of money that is used for a special purpose; or

A sum of money or other resources whose principal or interest is set apart for a specific objective

*The Oxford online dictionary* defines **funding** as: money provided, especially by an organization or government, for a particular purpose.

According to a historical ICAO research paper, funding suggests providing revenues through a ‘pay-as-you-go’ process. The revenue stream is typically drawn on for current ongoing expenditures, inducing a limited ability to spend beyond that revenue stream. Funding is thus the primary stream of revenue used to offset cost or to support various leveraging options for some projects. For instance, government funding is based on the requirements of the department or programme from which it comes. Funding may also be levied from user charges or from donations.

A similar search for a general definition of financing showed:

The *online Business Dictionary* defines **financing** as: the act of providing money for a project.

*Investopedia* defines **financing** as the act of providing funds for business activities, making purchases or investing. Financial institutions and banks are in the business of financing as they provide capital to businesses, consumers and investors to help them achieve their goals.

Financing on the other hand, according to an ICAO research paper involves some form of debt, thus allowing future streams of revenues to be available in the present in order to meet needs in a more timely and predictable way. Debt financing allows system to meet current needs from future revenues with an interest component. For instance, money is provided by a credit institution in the form of loans and credit lines: investors and banks are often common facilitators.

While the definitions point to clear differences, one of the key practical differences is in the timing of available monies. With respect to funding, monies can generally be available in a much shorter time frame compared with financing which often can include the procurement of the necessary money to pay for investments, or medium term working capital. Funding on the other hand is the procedure through which such monies are generally recouped (often principal plus interest).

Another attribute found in some funding cases such as donations and even Government funding is that there is no requirement for repayment as there is with most financing concepts or schemes. Additionally, funding may come from internal sources of a company or organization.

With respect to airport and air navigation facilities and services, funding is normally through user charges - for example through terminal and en route charges for ANSPs and through landing, parking and passenger service charges for airports.

There are many methods of financing – self-financing from revenues or retained earnings, commercial loans from banks and similar institutions, leasing or sale and leaseback arrangements with leasing companies, subsidized loans or outright grants from Institutions or governments, public-private initiative and to a limited extent incentives. The commonality however, is that financing relates to the issuance of debt and/or equity or the use of retained earnings.

The following section will now elaborate on some of the funding and financing schemes.

## 4. Workstream 3: Inventory of Funding Schemes

### User Charges

According to ICAO Doc 9082, the ICAO Council considers a charge to be a levy that is designed and applied specifically to recover the costs of providing facilities and services for civil aviation, and a tax is a levy that is designed to raise national or local government revenues, which are generally not applied to civil aviation in their entirety or on a cost-specific basis.

Charges or 'user charges' as they are commonly referred to in transport industries such as aviation is one of the most common and easily understood methods of funding. In the air transport industry, user charges include both Airport and ANSP Charges. ICAO Doc 9082 (ICAO's Policies on Charges for Airports and Air Navigation Services) contains the recommendations and conclusions of the Council on user charges. The policies in Doc 9082 are mainly based on the recommendations endorsed by States at the various Conferences on the economics of airports and air navigation services (e.g. CEANS 2008). They have its principal origin in Article 15 of the Chicago Convention. As per ICAO's policies on charges, user charges should be related to the cost of providing airport and air navigation facilities and services: the charges are to recover costs associated with the cost of capital and the depreciation of assets as well as the cost of maintenance, operation, management and administration. ICAO's policies in Doc 9082 specifically state:

As a general principle, providers may require the users to pay the portion of costs properly allocable to them but, at the same time, international civil aviation should not be required to meet costs which are not properly allocable to it (paragraph 2 vi) of Section II and paragraph 1 of Section III refer).

An equitable cost recovery system could comprise charges based on the allocation of total airport/air navigation services costs incurred on behalf of aeronautical users. The cost to be allocated is the full cost of providing the airport/air navigation services, including appropriate amounts for the cost of capital and depreciation of assets, as well as the costs of maintenance, operation, management and administration. In general, aircraft operators and other airport users, including end-users, should not be charged for facilities and services they do not use, other than those provided for and implemented under the Regional Air Navigation Plan(s) (paragraph 2 i) and 2 ii) of Section II and paragraph 3 i) and 3 ii) of Section III of Doc 9082 refer).

As per ICAO's policies in Doc 9082, Airport/air navigation services may produce sufficient revenues to exceed all direct and indirect operating costs and so provide for a reasonable return on assets (for air navigation services before tax and cost of capital) to secure efficient financing for the purpose of investing in new or enhanced infrastructure (paragraph 2 viii) of Section II and paragraph 3 vi) of Section III of Doc 9082 refer). Furthermore, costs directly related to oversight functions (safety, security and economic oversight) for airport and air navigation services may be included in the airport or the air navigation services provider's cost basis, at the discretion of the State (paragraph 2 x) of Section II and paragraph 3 vii) of Section III of Doc 9082 refer).

## **Air Navigation Service (ANS) Charges**

Air navigation charges are the present system of funding ATM costs and are likely to remain the principal system of funding irrespective of the financing methods chosen. ICAO Doc 9161 (Manual on Air Navigation Services Economics) provides practical guidance to States, air navigation services providers, and designated charging and regulatory authorities to assist in the efficient management of air navigation services and in implementing ICAO's Policies on Charges for Airports and Air Navigation Services (Doc 9082).

With respect to air navigation services charges, the costs to be taken into account should be those assessed in relation to the facilities and services, including satellite services, provided for and implemented under the ICAO Regional Air Navigation Plan(s), supplemented where necessary pursuant to recommendations made by the relevant ICAO Regional Air Navigation Meeting, as approved by the ICAO Council. Any other facilities and services, unless provided at the request of aircraft operators, should be excluded, as should the cost of facilities or services provided on contract or by the aircraft operators themselves, as well as any excessive construction, operation or maintenance expenditures. Furthermore, the costs of air navigation services provided during the en-route, approach and aerodrome phases of aircraft operations should be identified separately where possible. Finally, the costs of supporting services such as aeronautical meteorological services (MET), aeronautical information services (AIS) and other ancillary services should also be identified separately (paragraph 3 ii), 3 iii) and 3 iv) of Section III of Doc 9082 refer).

## **Miscellaneous Users exempted from User Charges**

Some Users or flights are exempted from User Charges and the ATM costs are met from sundry sources. Although small in terms of charges involved, these costs are met through subsidies and grants from governments from subscription of clubs, fees of training schools and in some very limited cases through subsidies from other User charges. Some states apply this type of exemption for State aircraft.

## **Route Charges**

Europe is applying route charges, based on ICAO's key charging principles. The European Union is mandated by its States to develop the Single European Sky policy, including a set of regulations that are mandatory for the States to implement. The route charges are based on European Commission Regulation (EU) No 391/2013 of 3 May 2013 laying down a common charging scheme for air navigation services; in combination with European Commission Regulation (EU) No 1191/2010 of 16 December 2010 amending Regulation (EC) No 1794/2006 laying down a common charging scheme for air navigation services. This regulation is mandatory for EU Member States. The notion of incentives is incorporated in this regulation.

States, at national or Functional Airspace Block level, may, on a non-discriminatory and transparent basis, establish or approve incentive schemes to support improvements in the provision of air navigation services or the reduction of the environmental impact of aviation (this relates to the KPAs applied in the performance scheme in Europe, based on the KPAs of ICAO, but simplified).

Those incentives may apply to air navigation service providers or airspace users.

States, at national or functional airspace block level, may adopt financial incentives for the achievement of performance targets by their air navigation service providers. This means, they can apply an incentive scheme with respect to users of air navigation services in order to:

- a) optimise the use of air navigation services;
- b) reduce the environmental impact of flying;
- c) reduce the overall costs of air navigation services and increase their efficiency, in particular by decreasing or modulating charges according to airborne equipment that increases capacity or offsetting the inconvenience of choosing less congested routings;
- d) accelerate the deployment of SESAR ATM capabilities.

A European perspective suggests that incentives may form a part of a bigger framework of implementing/deploying new concepts and new techniques to modernise ATM and if so, how is this related to the ICAO GANP/ASBU:

- The common charging scheme should be an integral element in reaching the objectives of the performance scheme;
- the charging scheme should promote cost and operational efficiencies and should provide for the establishment of incentive schemes for air navigation service providers to support improvements in the provision of air navigation services, including the application of traffic risk sharing.
- The common charging scheme should be consistent with the EUROCONTROL Route Charges System and Article 15 of the 1944 ICAO Chicago Convention on International Civil Aviation (the 'Chicago Convention').

It must finally be noted that to be compliant with the provisions in ICAO's policies in Doc 9082, the system of incentives must not discriminate between users the purpose, the creation and criteria for incentives is to be transparent, the costs associated with the system of incentives should not be allocated to users not benefiting from them, and any system of incentives should be subject to consultation with the users.

## **Airport Charges**

Similar to air navigation charges, airport charges are the current funding method for the provision of airport facilities and services. ICAO Doc 9562 (Airport Economics Manual) provides practical guidance to States, airports, and designated charging and regulatory authorities to assist in the efficient management of airports and in implementing ICAO's Policies on Charges for Airports and Air Navigation Services (Doc 9082).

With respect to airport charges, only the cost of those facilities and services in general used by international air services should be included, and the cost of facilities or premises exclusively leased or occupied and charged for separately, should be excluded; the capacity of users to pay should not be taken into account until all costs are fully assessed and distributed on an objective basis. At that stage, the contributing capability of States and communities concerned should be taken into consideration, it being understood that any State or charging authority may recover less than its full costs in recognition

of local, regional or national benefits received (paragraph 2 iii) and paragraph ix) of Section II of Doc 9082 refer).

Airport operators charge and collect aeronautical charges, rentals and fees for the lease and use of facilities to passenger and cargo airlines, concessionaires, and other entities providing airport support services. Rentals, fees, and charges collected from airlines cover a portion of the operating expenses and debt service incurred by airport operators. Charges, rentals and fees collected from tenants of airport facilities are also often the primary source of funds for repayment of principal and interest on bonds.

### ***Passenger Facility Charges (PFC)***

In 1990, Congress enacted legislation to provide airports with an additional source of funding for capital projects, subject to FAA approval, in the form of PFCs. The Aviation Safety and Capacity Expansion Act of 1990 required U.S.DOT to issue regulations under which a public agency may be authorized to impose a PFC of \$1.00, \$2.00, or \$3.00 per enplaned passenger at commercial airports it controls. Under this act, airport-related projects that preserve or enhance safety, capacity, or security of the national air transportation system; reduce noise from an airport that is part of the system; or furnish opportunities for enhanced competition between or among air carriers are eligible.

The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21) included authorization to charge a PFC at the \$4.00 and \$4.50 levels that meet specific eligibility requirements. One such requirement, which applies only to large- and medium-hub airports, is that a project must make a "significant contribution" to improving air safety and security, increasing competition, reducing congestion, or reducing noise (in comparison with the "adequate justification" requirement for projects at a lower level). For operators of large- and medium-hub airports that are approved to collect a \$4.00 or \$4.50 PFC, passenger entitlement grants are reduced by 75% (rather than the 50% associated with lower PFC

More than \$2.2 billion in PFC revenues are collected by airport operators each year. PFC revenues are: (1) used on a "pay as-you-go" basis, where PFC collections and interest earnings are spent directly on capital projects, and/or (2) leveraged; that is, used to pay debt service on bonds or to repay other forms of debt.

### ***Airport Improvement Fees (AIF)***

Similar to the PFCs in the US described above, AIF have been introduced in other parts of the world as an additional fee for departing and connecting passengers at an airport. Generally, an AIF is charged by a government or airport management company for the purposes of funding major airport improvements or expansions or increasing airport services.

In some locations, AIF are included in the cost of the passenger's airline ticket whereas in other circumstances, passengers are charged only at the point of embarkation. In many cases, the fee continues to be charged well after the improvement or expansion has been completed as airports continue to pay off the cost of such activities for extended periods of time.

### ***Direct End-user Ticket Charge Based (as FAA is operating)***

The FAA (US) use direct end-user ticket charges as the base of the US ANSP cost coverage funding. This methodology enables the user of ATM services to refer the ANSP costs as a portion of their ticket price. The use of this method would shift ANSP costs from a 'user of ATM services pays principle' to a 'final consumer pays principle' or more like a tax system.

This method of price setting is under discussion. In comparison to the current European system it creates no additional pressure from airlines on the ATM service provider in the US to focus on higher efficiency. Users of ATM Services on the other hand are free to adopt a system of surcharge on ticket prices for ATM costs (like kerosene price increase surcharge) if they are willing to justify such a surcharge. They would come under increasing pressure from Consumer Groups to provide further analysis on the components of the ticket price.

### **Non-Repayable Grants, Subsidies from Governments or Lending Institutions**

Under particular circumstances for general social or economic benefits or for creating harmonised systems (pan-European) National Governments either individually or through joint institutions like the European Commission, European Investment Bank, EUROCONTROL could provide grants or subsidies, which do not need be repaid. Such Grants or subsidies could provide funding for large pan European or multi state projects. Similarly Local or state Governments may subsidize airports for broader economic reasons. Such funding must not distort competition.

Docs 9562 and Doc 9161 list Bilateral Development Agencies and Banks as sources of either grants or specialized debt financing.

#### **BILATERAL DEVELOPMENT AGENCIES**

Belgium - Belgian Development Cooperation — Brussels  
Canada - Canadian International Development Agency (CIDA) — Gatineau, Quebec  
Denmark - Danish Development Assistance (DANIDA) — Copenhagen  
France - Agence Française de Développement (AFD) — Paris  
Germany - Federal Ministry for Economic Cooperation and Development (BMZ) — Bonn  
Kreditanstalt für Wiederaufbau (KfW) — Frankfurt  
Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) — Eschborn (Frankfurt)  
Italy - Direzione Generale per la Cooperazione allo Sviluppo (DGCS) — Rome  
Japan - Japan Bank for International Cooperation (JBIC) — Tokyo  
Netherlands - Ministry of Foreign Affairs — The Hague  
Norway - Norwegian - Agency for Development Cooperation (Norad) — Oslo  
Russian Federation Ministry of Economic Development and Trade — Moscow  
Spain - Agencia Española de Cooperación Internacional (AECI) — Madrid  
Sweden - Swedish International Development Cooperation Agency (SIDA) — Stockholm  
United Kingdom - Overseas Development Administration (ODA) — London  
United States - United States Agency for International Development (USAID) — Washington, D.C.

#### **DEVELOPMENT BANKS AND FUNDS**

African Development Bank Group (AfDB - Abidjan, Côte d'Ivoire

Andean Development Corporation (CAF- Caracas, Venezuela  
Asian Development Bank (ADB) - Manila, Philippines  
Black Sea Trade and Development Bank (BSTDB) - Thessaloniki, Greece  
Caribbean Development Bank (CDB - St. Michael, Barbados  
Central American Bank for Economic Integration (CABEI Tegucigalpa, Honduras  
East African Development Bank (EADB) - Kampala, Uganda  
Eastern and Southern African Trade and Development Bank (PTA Bank) - Nairobi, Kenya  
European Bank for Reconstruction and Development (EBRD) - London, United Kingdom  
European Development Fund (EDF) - Brussels, Belgium  
European Investment Bank (EIB) - Luxembourg, Luxembourg  
Financial Fund for the Development of the River Plate Basin (FONPLATA) - Sucre, Bolivia  
Fund for Cooperation, Compensation and Development (ECOWAS Fund) - Lome, Togo  
Inter-American Development Bank (IDB) - Washington, D.C., United States  
International Bank for Reconstruction and Development (IBRD) - Washington, D.C., United States  
International Development Association (IDA) - Washington, D.C., United States  
International Finance Corporation (IFC) - Washington, D.C., United States  
International Monetary Fund (IMF)- Washington, D.C., United States  
Nordic Development Fund (NF) - Helsinki, Finland  
Nordic Investment Bank (NIB) - Helsinki, Finland  
Organization of the Petroleum Exporting Countries (OPEC) Fund for International Development - Vienna, Austria  
The World Bank, Washington, D.C., United States

In addition, the following institutions are established and financed essentially by Arab States:

Abu Dhabi Fund for Economic Development - Abu Dhabi, United Arab Emirates  
Arab Bank for Economic Development in Africa (BADEA) - Khartoum, Sudan  
Arab Fund for Economic and Social Development (AFESD) - Kuwait City, Kuwait  
Arab Monetary Fund (AMF) - Abu Dhabi, United Arab Emirates  
Islamic Development Bank Group (IDB) - Jeddah, Saudi Arabia  
Kuwait Fund for Arab Economic Development (KFAED) - Kuwait City, Kuwait  
Saudi Fund for Development (SFD) - Riyadh, Saudi Arabia

Additionally, as noted in ICAO Docs 9562 and 9161, the United Nations Development Programme could be a source for funding and financing as well as expertise in implementation.

### ***Grants or Upfront Funding - Europe***

Where a Project is difficult to justify on clear cost-benefit grounds but are of vital importance for safety or overall success of the European ATM Master Plan - States or the European Union may grant outright non-repayable grants for financing such projects. In some cases over the long term when benefits start to accrue such Grants could be recouped. Large infrastructural projects like roads and railways often obtain such grants. The Grants could be for the full cost of the Project or part of the costs. Governmental Agencies would also often provide Grants for Projects with clear Socio-economic benefits for a region or country.

Such Grants are normally funded from Government Budgets or Institutional Budgets.

### AIP Grants from Airport and Airway Trust Fund Administered by FAA

Federal AIP grants administered by FAA are funded by aviation user taxes. AIP grants are made available to airport operators in numerous forms:

- *Entitlement funds*, which are apportioned to primary airports based on levels of passenger traffic and to cargo service airports based on levels of cargo aircraft landed weight, subject to certain minimum and maximum levels.
- *Small airport funds*, which are apportioned to general aviation (including reliever) and non-hub commercial service airports.
- *Set aside funds*, which are dedicated to noise compatibility planning and implementation, the Military Airport Program, and reliever airports.
- *State apportionments*, which are principally apportioned for non-primary commercial service, general aviation, and reliever airports based on an area/population formula among the 50 states, the District of Columbia, Puerto Rico, and insular areas. In Alaska, Hawaii, and Puerto Rico these amounts may be used at any primary or non-primary airport in addition to other designated entitlements.
- *Non-primary apportionments*, which are apportioned based on the needs for a particular non-primary airport in the most recently published NPIAS, subject to overall caps.
- *Discretionary funds*, which are distributed based on the ranking of the airport's projects in relation to others deemed most important for improving the national airspace system.

### **Pre-funding**

Pre-funding is a financing option (for development or upgrades of infrastructure) that may be accepted in specific circumstances and after having allowed for contributions from non-aeronautical revenues. ICAO's policies on charges in Doc 9082 nonetheless provides that pre-funding is acceptable only provided that strict safeguards are implemented, notably with respect to economic oversight, accounting, substantive consultation and to the greatest extent possible agreement with the users, and time-limitation.

### **FAA Funding Model**

The FAA (US) is funded primarily series of excise taxes paid by users of the national airspace system and by the federal government general tax funds. Most of the taxes revenues collected are derived from excise taxes on domestic airline passenger tickets, domestic airline passenger flight segments, and international passenger arrivals and departures. General aviation aircraft operators pay aviation fuel taxes. The direct users of the system, the aircraft operators, do not pay ANSP fees. Instead, like passengers, aircraft operators contribute to the services they receive through excise taxes.

Over the years, the FAA has considered various funding proposals to change the way that it finances the provision of ATC and related services, including changes to the existing tax structure as well as user fee based systems similar to those that exist in Europe. There are both pluses and minuses associated with these funding approaches, too numerous to discussion in the context of this document.

## **Using Sources of Funding Strategically**

Aligning the sources of capital funds with allowable and optimal uses is essential for airport operators to maximize the impact of each dollar. Certain funding sources such as PFCs 12 and AIP grants have restrictions in how they can be used. In addition, sources such as revenue bonds are more effective when targeted to projects having a direct income stream, especially when airline approvals are required. After maximizing the use of federal AIP grants and PFC revenues for major capacity-enhancing projects, airport operators can fund capital projects from a combination of debt and equity. Private and/or third-party funding may also make sense for certain types of facilities, such as maintenance facilities, flight kitchens, and cargo facilities.

## Workstream 4: Inventory of Financing Schemes

### Debt Financing

Debt is borrowing money from an outside source with the promise to return the principal, in addition to an agreed-upon level of interest. Although the term tends to have a negative connotation, startup companies often turn to debt to finance their operations. In fact, even the healthiest of corporate balance sheets will include some level of debt. In finance, debt is also referred to as “leverage.” The most popular source for debt financing is the bank, but debt can also be issued by a private company or even a friend or family member.

#### *Advantages*

**Maintain ownership:** When borrowing from the bank or another lender, borrowers are obligated to make the agreed-upon payments on time. But that is the end of the obligation to the lender. Borrowers can choose to run businesses however they choose without outside interference.

**Tax deductions:** This is a huge attraction for debt financing. In most cases, the principal and interest payments on a business loan are classified as business expenses, and thus can be deducted from business income taxes. It helps to think of the government as a “partner” in business, with a 30 percent ownership stake (or whatever the business tax rate is).

**Lower interest rate:** Furthermore, it is important to analyze the impact of tax deductions on the bank interest rate. If the bank is charging 10 percent for the loan, and the government taxes at 30 percent, then there is an advantage to taking a loan that can be deducted. Take 10 percent and multiply it by (1 - tax rate), in this case it's: 10 percent times (1 - 30 percent), which equals 7 percent. After the tax deductions, the owing interest rate will be the equivalent of a 7 percent.

#### *Disadvantages*

**Repayment:** As mentioned above, the sole obligation to the lender is to make payments. Unfortunately even if business fails, there is still an obligation to make payments. If bankruptcy is forced upon, lenders will have claim to repayment before any equity investors.

**High rates:** Even after calculating the discounted interest rate from the tax deductions, as explained above, there is still the possibility of facing a high interest rate. Interest rates will vary with macroeconomic conditions, individual or corporate history with the banks, business credit rating and credit history.

**Impacts on credit rating:** It might seem attractive to keep bringing on debt when organizations need money, a practice known as “levering up,” but each loan will be noted on the credit rating. And the more you borrow, the higher the risk to the lender, and the higher interest rate that is required.

Cash and collateral: Even when planning to use the loan to invest in an important asset, it is important to make sure that business will be generating sufficient cash flows by the time loan repayment starts. Also I likely be asked to put up collateral on the loan in case you default on your payments.

### **Borrowings from Commercial Banks**

This is the most common method of financing for medium to long term financing requirements. Loans lasting eight to fifteen years are used to either provide bridging loan or financing for a six to ten year project. At present Central Bank interest rates in Europe are very low. For short-term working capital or bridging finance bank overdrafts, floating lines or in some cases short-term loans could be used. Moreover as most of the ANSPs are government backed the loans are treated as sovereign loans and attract discounts from market rates.

Most self-financing stakeholders like Airspace Users, Airports, and ANSPs revert to this form of financing where retained earnings or their own revenues cannot finance large projects. Where clear ownership of the assets can be demonstrated Commercial Institutions would lend against the asset value as collateral. In this area the European Investment Bank (EIB) or Banks backed by State Guarantees could arrange loans at subsidized rates if the cost of borrowing becomes very high or sources of such loans dry out due to market situation.

### **Borrowings from Development Banks**

The list of Development Agencies, Banks and Institutions listed earlier (and found in Doc 9562 and 9161) are examples of sources for borrowings. Such institutions have provisions to lend with specialised terms, conditions and rates.

### **Borrowings from Financial Institutions**

Financial institutions like European Investment Bank (EIB), European Bank for Reconstruction and Development, Hermes of Germany, EXIM Bank of USA often lend for well-constructed Capital Projects. The interest rates are comparable to or competitive with commercial banks.

## **Bond Financing**

### **Definition**

Investopedia defines bonds as a debt investment in which an investor loans money to an entity (corporate or governmental) that borrows the funds for a defined period of time at a fixed interest rate. Bonds are used by companies, municipalities, states and U.S. and foreign governments to finance a variety of projects and activities.

Bonds are commonly referred to as fixed-income securities and are one of the three main asset classes, along with stocks and cash equivalents.

The indebted entity (issuer) issues a bond that states the interest rate (coupon) that will be paid and when the loaned funds (bond principal) are to be returned (maturity date). Interest on bonds is usually

paid every six months (semi-annually). The main categories of bonds are corporate bonds, municipal bonds, and U.S. Treasury bonds, notes and bills, which are collectively referred to as simply "Treasury securities."

Two features of a bond - credit quality and duration - are the principal determinants of a bond's interest rate. Bond maturities range from a 90-day Treasury bill to a 30-year government bond. Corporate and municipals are typically in the three to 10-year range.

Bond financing allows the borrower to access debt directly from individuals and institutions, rather than using commercial lenders as intermediaries. The issuer (the borrower) sells the bonds to the investors. The lead manager helps the issuer to market the bonds. A trustee holds rights and acts on behalf of the investors, stopping any one investor from independently declaring a default. Rating agencies will assess the riskiness of the project, and assign a credit rating to the bonds which will signal to bond purchasers the attractiveness of the investment and the price they should pay. Bond financing generally provides lower borrowing costs, if the credit rating for the project is sufficiently strong. Rating agencies may be consulted when structuring the project to maximise the credit rating for the project.

Bond financing provides a number of benefits to projects including lower interest rates, longer maturity (which can be very helpful given the duration of most of these projects) and more liquidity. The disadvantages associated with financing through bond issues include:

- "Negative carry", bond financing is drawn all at once, up front, and therefore interest is charged on the entire amount from day one. The borrower will have to bear the "cost of carry", being the interest paid on the bond proceeds, from the date of receipt to the date it is used to invest in capital expenditure;
- less certainty in the underwriting process due to the volatility in the securities market,
- less flexibility during project implementation (e.g. to approve waivers and amendments), given the diversity of bondholders and the difficulty of getting approval for changes;
- more time and cost, due to more extensive disclosure processes and the rating process; and

Bond financing has seen limited usage for initial project financing, but is commonly used for refinancing, once construction risks have been largely mitigated.

Airports, particularly in the United States, have been instrumental in using bonds. According to ACI, airport capital needs are estimated to exceed \$71.3 billion for 2013 through 2017, or approximately \$14.3 billion per year, according to the 2012 Airport Capital Development Needs Survey conducted by ACI-NA. The Airport Improvement Program (AIP) administered by FAA currently distributes about \$3.35 billion entitlement and discretionary grants to airports, leaving a gap of about \$10.95 billion per year to be funded with local sources.

### **Airports' Use of Bonds**

Airports frequently turn to the capital markets to finance long-term construction projects. Bond proceeds are the largest sources of funds for airport capital needs, accounting for approximately 54% of the total funds historically. Total bond issuance including both new money bonds and refunding between 2006 and 2011 ranged from \$6.3 billion in 2006 to \$12.4 billion in 2010 with an average of \$8.8

billion. The ACI-NA survey shows that large hubs are anticipating financing 58% of their planned projects between 2013-17 through bonds, medium hubs at 23% and small hubs at 22%.

### **Airports in the Municipal Bond Market**

Airport operators are major and regular participants in the municipal bond markets and have utilized numerous types of municipal bonds to finance airport capital projects including:

- (a) general obligation bonds supported by the overall tax base of the issuing entity (the airport sponsor),
- (b) general airport revenue bonds secured by the revenues of the airport and other revenues as defined in the bond indenture,
- (c) bonds either backed solely by PFC revenues or by PFC revenues and airport revenues generated by rentals, fees and charges, and
- (d) special facility bonds backed solely by revenues from a facility constructed with proceeds of those bonds.

Depending on the nature of the projects being financed by the airport, most bonds are considered a special form of municipal bonds called private activity bonds (PABs). Often times, PABs are subject to the Alternative Minimum Tax, thereby raising the return demanded by the investor and the financing costs for the airport.

### **Airport Municipal Bonds: Lower Costs, Better Service**

Airports are carefully managing operating, financing and capital expenses to maintain their good credit rating which helps lower their borrowing costs. Airport operators constantly monitor the financial markets and respond to changes in market conditions accordingly. For example, bond issuance spiked in 2010 driven by low interest rates and the Alternative Minimum Tax holiday. Lower borrowing costs through municipal bonds allow airports to pass the savings to airlines through lower rates and charges, which help sustain existing and attract new air carrier service, ultimately benefiting passengers with more service choices. Air service also helps generate jobs and economic development in the community.

Airports, mostly in the United States, are using a variety of different bonds to finance various projects. The description below identifies some of the bonds used by airports (sourced from Airport Cooperative Research Program).

### **TYPES OF AIRPORT BONDS**

Airport sponsors and operators issue various forms of bonds to finance generally large-scale capital projects with long-term debt. This section discusses the following types of bonds:

- General obligation (GO) bonds
- GARBS
- Bonds backed by PFCs
- Bonds backed by customer facility charges (CFCs)
- Bonds to be paid with future grants
- Ways of addressing AMT issues
- Potential new tax credit bonds (TCBs) for baggage screening infrastructure.

### **General Obligation (GO) Bonds**

GO bonds may be issued to finance airport capital improvements, backed by general tax revenues of the city, county, or state that owns and operates the airport. Specifically, local general tax revenues such as

sales, income, or property taxes may be pledged as a source of repayment for GO bonds, although the airport operator may actually pay debt service from airport sources, or, in rarer instances, general local taxes may directly pay debt service on proceeds used to fund airport projects.

Some large airports such as Honolulu International Airport pay debt service on outstanding GO bonds issued on their behalf by their airport sponsor (in this case, by the state of Hawaii); however, the bonds were generally issued decades ago and the outstanding balances are relatively small. GO bonds are currently a key financing tool for many small airports for several important reasons:

- Stronger credit with lower interest rates—GO bonds are a stronger credit than GARBs, which are discussed later. GO bonds therefore result in lower interest costs for the airport because the bonds are backed by the full faith and credit of a city, county, or state that (1) has a much larger and diverse tax revenue base than an airport's revenue base, and (2) can typically adjust tax rates often more readily than an airport operator can adjust airport rates and charges. However, in certain states voters must approve tax rate adjustments and/or issuance of bonds, which may make GO debt less attractive than GARBs.
- Lower issuance costs—GO bonds do not have the upfront costs of developing a separate indenture/ordinance, getting bond ratings and insurance, and preparing feasibility studies that GARBs have. These upfront GARB costs do not generally vary significantly with the size of the bonds being issued, and so constitute a larger percentage of the GARB for small airports issuing smaller numbers of bonds. This makes GO bonds more attractive the smaller the bond issue is, and because smaller airports typically have smaller capital needs, GO debt is typically more attractive for them.
- No coverage requirement—Airport operators are typically required to maintain coverage of 1.25x or 1.35x; that is, the ratio of net revenues after paying operating costs to annual debt service must be at least 125% or 135% to give investors comfort that their debt will be repaid. Because of the strength of GO bond credits, coverage is not required, which can also save airport operators money.

### **General Airport Revenue Bonds**

GARBs are traditionally the most commonly issued bonds for airport infrastructure. Their credit rating is based on revenues generated at the airport from airline rates and charges, parking, rental car operations, terminal concessions, other leases, interest, and any other revenues of the airport. Following the economic downturn in 2000 and the terrorist attacks of 9-11, GARB credit ratings for several airports were downgraded, and 19 of the 31 large-hubs carried negative outlooks (*Aviation Infrastructure Innovative Financing* 2002). The financial outlook and accompanying credit ratings for airports have subsequently steadily improved as airport operators have taken many steps to manage their financial results, and as traffic levels have returned to pre-9-11 levels.

Other types of bonds reflecting innovations by airport operators and financial markets exist. Even within the category of GARBs various innovations can be seen. The information below describes some of these.

- Use of sureties in lieu of funded reserves—Airport operators historically funded required debt service reserves from either available retained earnings (cash) or from bond proceeds. Sureties can be obtained from the financial markets either at the time of, or any time, after bond issuance, to be used in lieu of a funded reserve. Sureties are recognized by the rating agencies, bond insurers, and investors as equivalent security to providing a funded reserve. The airport operator pays a fee at issuance, usually a percentage of the new or outstanding principal, and in the event that it is needed to pay debt service, the surety is drawn on. Use of sureties can reduce the size of a bond issue and therefore annual debt service by eliminating the need to fund a debt service reserve account and/or free cash held in a reserve

to be used for any allowable airport purpose (allowable uses may need to be determined by the airport operator's bond counsel, depending on the provisions of its bond indenture or ordinance).

- Use of intermediate and subordinate liens—it is increasingly common for airport operators to issue bonds with a lower pledge of airport revenues than its senior debt. Issuing intermediate and subordinate debt can reduce coverage requirements and annual airline rates and charges. The downside is that such liens typically require new bond indentures or ordinances, which can add time and costs to the issuance process.

- Interest rate swaps—Airports increasingly enter into “over-the-counter” contracts with investment banks to “swap” or exchange a stream of interest payments for another party's stream. Each swap is a unique contract between the parties and cannot be bought and sold like securities or futures contracts. Interest rate swaps are normally “fixed against floating,” where an airport operator exchanges fixed-rate obligations for floating rate obligations, or “floating to fixed,” where the reverse happens. The principal amounts are not exchanged, and are referred to as the notional principal (with the exception of basis swaps). Swaps are often used to hedge certain risks, for instance interest rate risk (see, for example, Figure 10).

By swapping interest rates, an airport operator is able to synthetically alter its interest rate exposures and bring them in line with management's appetite for interest rate risk. Forms of interest rate swaps include:

- Forward current refunding (synthetic fixed)—A fairly common type of swap transacted by operators of airports such as Charlotte/Douglas International, Jacksonville International, Miami–Dade International, Sacramento International, Salt Lake City International, and Wayne County (Detroit).

- Advance refunding (synthetic fixed)—Examples include operators of the airports in Atlanta and Manchester, New Hampshire.

- Swaption for refunding—A swaption is a financial instrument granting the owner an option to enter an interest rate swap pursuant to certain agreed upon terms. Examples include the operators of airports serving Philadelphia, Portland (Oregon), Chicago (Midway), and Albany.

- Forward hedge for new money—Examples include the Indianapolis Airport Authority and the Metropolitan

Washington Airports Authority

- Synthetic variable—Have been used by the operators of airports serving Boston, Las Vegas, and Orlando.

- Basis swap—Also known as “floating to floating” swaps, have been used by the operators of airports in Cleveland, Las Vegas, and New Orleans.

### **Passenger Facility Charge Bonds**

Airport operators have increasingly issued bonds that either include a pledge of PFC revenues and/or are to be repaid in part or in full from PFC revenues. Approaches to leveraging PFC revenues include:

- Combined flow of funds—these bonds are a form of GARB, where the bonds are secured by an underlying pledge of airport revenues. Under this structure, PFC revenues, or certain PFC revenues, are defined as airport revenues in the bond indenture. Combined airport revenues are then used to pay GARB debt service. This bond structure is used by the airports serving Albuquerque, Guam, and Orlando, among others.

- *Advantages*—it is relatively easy to incorporate into an existing revenue bond indenture, and debt service coverage requirements can be lower relative to standalone PFC bonds (i.e., 1.25x–1.35x instead of 1.5x for stand-alone PFC-backed bonds).

– *Disadvantages*—bonds issued under this approach reduce the airport sponsor’s GARB capacity, and sometimes more importantly, may require airline majority-in-interest approval.

- Direct debt service offset—these bonds are another form of GARB secured by airport revenues. PFC revenues are used to pay all or a part of the GARB debt service, but they do not secure the bonds. Debt service may be included in the airline rate base if projected PFC revenues are not realized under this structure. This bond structure is used by the airports serving Albany, Austin, Cleveland, Denver, El Paso, Grand Rapids, and Providence, among others.

- *Advantages*—they result in higher demonstrated debt service coverage relative to the combined flow of funds structure, as PFC revenues directly offset debt service (the denominator in the coverage calculation). Also, debt service coverage requirements can be lower relative to stand-alone PFC bonds.

- *Disadvantages*—(1) they do not preserve GARB capacity, (2) they are not applicable to airports where the definition of airport “Revenues” includes PFC revenues, or that pledges airport revenues elsewhere, and/or (3) they may require airline majority-in-interest approval.

- Back-up pledge of subordinate airport revenues—These bonds are secured by PFC revenues with a back-up pledge of airport revenue that is subordinate to a more senior lien on airport revenue. This bond structure is used by the airports serving Baltimore, Las Vegas, Nashville, and Sacramento, among others.

- *Advantages*—(1) it enhances the creditworthiness of the bonds versus stand-alone PFC bonds, (2) it keeps the costs out of the airline rate base, (3) debt service coverage requirements can be lower relative to standalone PFC bonds (i.e., 1.25x–1.35x), (4) it preserves the senior lien GARB capacity, and (5) it maximizes airport management control over airport financing decisions.

- *Disadvantages*—they are not applicable to airports where the definition of airport “Revenues” includes PFC revenues or that pledges them elsewhere.

- Stand-alone PFC bonds—Issuance of bonds backed solely by PFC revenues has evolved since they were first issued in 1994. Stand-alone PFC bonds have been issued by the airports serving Boston, Chicago, Fort Lauderdale, Lee County (Fort Myers, Florida), Little Rock, New Orleans, Palm Springs, Portland (Oregon), Richmond, and Seattle.

- *Advantages*—(1) they preserve GARB capacity, (2) keep costs out of the airline rate base, and (3) maximize airport management control over airport financing decisions because they do not require airline majority-in-interest approval.

- *Disadvantages*—

- (1) PFC revenues are completely dependent on passenger volumes; (2) the bonds entail development of a new indenture or ordinance; (3) they require FAA termination protection and approval of the bond indenture;

- (4) they require more rigorous tests and sensitivity analysis; (5) they have higher required debt service coverage levels, typically 1.5x; and (6) they are not applicable to airports where the definition of airport “Revenues” includes PFC revenues, or that pledges them elsewhere.

- Convertible lien PFC bonds—Another concept is to issue bonds initially secured solely by PFC revenues that subsequently convert to GARBs. To date, the only airport to issue such bonds is Broward County, which operates Fort Lauderdale–Hollywood International Airport.

### **Bonds Backed by Customer Facility Charges**

As discussed in chapter three, CFCs are collected by rental car companies from their customers at certain airports to pay operating expenses and debt service for consolidated rental car facilities. As with

PFC revenues, CFC revenues can be structured in many of the same ways as the various forms of PFC bonds.

- Combined flow of funds—these bonds have the same characteristics, advantages, and disadvantages as PFC bonds structured as a combined flow of funds. Examples include the bonds issued for the consolidated rental car facility at Fort Lauderdale–Hollywood International Airport.
- Direct debt service offset—these bonds have the same characteristics, advantages, and disadvantages as PFC bonds structured with a debt service offset. No specific examples of this type of CFC bond have been identified; however, they could be implemented by interested airports.
- Back-up pledge of subordinate airport revenues—these bonds have the same characteristics, advantages, and disadvantages as PFC bonds structured as CFC bonds with a back-up pledge of subordinate airport revenues. No specific examples of this type of CFC bond have been identified; however, they could be implemented by interested airports.
- Stand-alone CFC bonds—these bonds have the same characteristics, advantages, and disadvantages as standalone PFC bonds. Examples include the bonds issued for the consolidated rental car facility at Dallas/Fort Worth International Airport.

### **Single-Tenant Special Facility Bonds**

Special facility bonds issued by a single tenant are used to finance unit passenger terminals or portions of terminals, hangar and maintenance facilities, cargo buildings, and ground equipment support facilities for the exclusive use of an airline. The bonds are backed solely by an airline corporate pledge to repay the debt. According to a study by the FAA Office of Policy and Plans, however, this form of financing has come under significant scrutiny as a result of recent airline bankruptcies and defaults (*Aviation Infrastructure Innovative Financing* 2002).

For example, one airline rejected payment of its special facility bond obligations and discontinued use of its maintenance facility at an airport. Another airline closed its maintenance facility that had been funded with special facility bonds.

### **Multi-Tenant Special Facility Bonds**

Special facility bonds have been issued to fund multi-tenant terminals, fuel storage and distribution facilities, and consolidated rental car facilities, as discussed in chapter four. These bonds have greater credit strengths than single-tenant special facility bonds because of the more diverse revenue base from multiple tenants and users.

### **Ways of Addressing Alternative Minimum Tax Issues**

Under current tax rules, interest on private-activity bonds, including most airport debt, is subject to the AMT, which was introduced in 1969 to ensure that top income earners paid their share of income taxes. Despite the public nature of most airport facilities and the public benefit derived from their use, more than 60% of airport bonds currently can only be sold as private-activity bonds rather than as tax-exempt governmental purpose bonds. Historically, the interest rate penalty for interest on bonds for which interest earnings are subject to the AMT ranges from 16 basis points (0.16%) to 49 basis points (0.49%), depending on the status of tax reform proposals that would affect the AMT (“Airline Agreement Paves Way for Non-AMT O’Hare Bonds” 2005) (see Figure 12). Another key problem with AMT debt is that under current law, governmental purpose bonds may be advance-refunded once and only once, at any time 10 years after issuance, but airport private-activity bonds are prohibited from being advance refunded. This eliminates the ability of airport operators to realize interest savings by refunding AMT debt when interest rates are lower.

Two key developments relating to AMT restrictions and associated interest rate penalties are:

- Multi-purpose allocation refundings—historically, it has been possible for airport operators to issue “non-AMT” (i.e., tax-exempt) debt with lower interest rates for parking facilities (as long as the airport’s bond counsel concurs), because such facilities are used by the public and not private companies. A ruling by the Internal Revenue Service a number of years ago clarified that airfield projects could be financed on a non-AMT (tax-exempt) basis, which triggered multipurpose allocations to allocate prior bond proceeds between airfield projects (to be refunded with non-AMT debt with lower interest rates) and terminal projects that are still considered not open to the public and therefore are to remain AMT funded.

Many airports carried out multipurpose allocations to refund the portions of prior bonds associated with airfield projects that could be changed to non-AMT debt with lower interest rates. Denver International Airport is an example. However, some operators at airports with residual airline agreements were unable to get bond counsel concurrence because net revenues go back to signatory airlines, and the airports have differential rates for signatory and non-signatory airlines. The city of Chicago addressed this problem by changing its airline agreement, as described in Figure 12.

- Reform of the federal tax treatment of airport bonds—airport operators have, for some time, discussed the need to reclassify airport private activity bonds that directly benefit the general public as governmental purpose bonds, similar to the way GO debt is treated under the tax code. The change in status would eliminate the AMT penalty that increases interest rates on the bonds and allow advance refundings of airport bonds.

### **Potential New Tax Credit Bonds for Baggage Screening Infrastructure**

A recent Baggage Screening Investment Study conducted on behalf of TSA resulted in the recommendation that Congress adopt new legislation authorizing the use of a federal tax credit bond program for the capital costs of a baggage handling system and related infrastructure.

Tax credit bonds (TCBs) involve the issuance of taxable debt by state and local governments or other non-federal entities for designated capital purposes. Bond holders receive annual tax credits that can be applied against their federal income tax liability instead of cash interest payments. The tax credit itself represents taxable income to the bondholder. Principal is repayable by the issuer from non-federal sources. The bonds are generally structured as “bullet” term bonds, where the principal is repaid in a lump sum at bond maturity. TCBs are generally structured as bullet term bonds to maximize the value of the tax credit, and the issuer make periodic deposits to a sinking fund to provide for principal retirement at maturity.

Unlike other federal tax credit programs oriented to equity capital (such as tax credits for investments in low-income housing), TCBs do not require the project sponsor to be the “consumer” of the tax credit. Instead, this form of tax subsidy encourages private investment in desired infrastructure through lower-cost debt capital for the issuer.

TCBs provide a substantial subsidy to the issuer, as the interest expense can represent 50% to 80% of the effective cost of long-term borrowing. The extent of the subsidy depends on the term (maturity) of the bonds and the interest (credit) rates. The longer the term and the higher the interest rates the greater the subsidy level.

The TCBs could be on parity with an airport’s traditional revenue bond indebtedness or issued on a subordinate or stand-alone basis. Possible pledged revenue streams include one or more of the following:

- General airport revenues from airline rents and fees and nonairline sources, as is the case for traditional GARBs.
- PFC revenues, as is the case for stand-alone PFC-backed bonds and double-barrel bonds backed by PFC revenues and general airport revenues.
- General local governmental resources such as sales and property taxes, as is the case for general obligation municipal bonds issued to fund airport projects (more common for small- and non-hub airports than large- and medium-hub airports)

Airport participation in the TCB program would be entirely voluntary. It is anticipated that large- and medium-hub airports, which frequently access the capital markets to raise capital, would be the most likely issuers of TCBs. Although smaller airports would not be excluded, the resource demands on smaller airports for this type of issuance would be relatively high compared with their smaller borrowing needs.

## Equity Financing

### *Definition*

According to Investopedia, equity financing is the process of raising capital through the sale of shares in an enterprise. Equity financing essentially refers to the sale of an ownership interest to raise funds for business purposes. Equity financing spans a wide range of activities in scale and scope, from a few thousand dollars raised by an entrepreneur from friends and family, to giant initial public offerings (IPOs) running into the billions by household names such as Google and Facebook. While the term is generally associated with financings by public companies listed on an exchange, it includes financings by private companies as well. Equity financing is distinct from debt financing, which refers to funds borrowed by a business.

Equity financing involves not just the sale of common equity, but also the sale of other equity or quasi-equity instruments such as preferred stock, convertible preferred stock and equity units that include common shares and warrants.

A startup that grows into a successful company will have several rounds of equity financing as it evolves. Since a startup typically attracts different types of investors at various stages of its evolution, it may use different equity instruments for its financing needs.

For example, angel investors and venture capitalists – who are generally the first investors in a startup – are inclined to favor convertible preferred shares rather than common equity in exchange for funding new companies, since the former have greater upside potential and some downside protection. Once the company has grown large enough to consider going public, it may consider selling common equity to institutional and retail investors. Later on, if it needs additional capital, the company may go in for secondary equity financings such as a rights offering or an offering of equity units that includes warrants as a “sweetener.”

The equity-financing process is governed by regulation imposed by a local or national securities authority in most jurisdictions. Such regulation is primarily designed to protect the investing public from unscrupulous operators who may raise funds from unsuspecting investors and disappear with the

financing proceeds. An equity financing is therefore generally accompanied by an offering memorandum or prospectus, which contains a great deal of information that should help the investor make an informed decision about the merits of the financing. Such information includes the company's activities, details on its officers and directors, use of financing proceeds, risk factors, financial statements and so on.

Investor appetite for equity financings depends significantly on the state of financial markets in general and equity markets in particular. While a steady pace of equity financings is seen as a sign of investor confidence, a torrent of financings may indicate excessive optimism and a looming market top. For example, IPOs by dot-coms and technology companies reached record levels in the late 1990s, before the “tech wreck” that engulfed the Nasdaq from 2000 to 2002. The pace of equity financings typically drops off sharply after a sustained market correction due to investor risk-aversion during this period.

### *Advantages*

If you don't make a profit, you usually aren't required to pay them back. The absence of monthly loan payments can free up significant working capital for the business.

While investors or partners will only provide equity if they have faith in the earning power of your business, you don't necessarily need the pristine financial history that is required for a loan.

### *Disadvantages*

The cost of these benefits is that you no longer retain sole control of your business.

This means that not only will your investors be entitled to a share of profits, but they also have a say in the running of your business and the direction it's headed.

This may not seem like a problem at the beginning when you need cash, but can sometimes lead to conflict further down the road.

It is also important to note that IPOs can be a risky investment, whether for a bond or stock issue. The key risk is that more often than not, there is little historical experience upon which to be able to analyze and price the issue.

### **Privatisation - as a form of equity**

ICAO Doc 9980 refers to Privatisation as a: Transfer of full or majority ownership of facilities and services from the public sector to the private sector.

A more descriptive definition is found within the same ICAO document: is the word most commonly used in connection with the changes taking place in ownership and management in the provision of airports and air navigation services. Often, the word privatization is loosely interpreted as any movement away from government ownership and management of facilities and services. This is too liberal an interpretation. Strictly, privatization connotes either full ownership or majority ownership of facilities and services. Therefore, a management contract, a lease or minority participation in the equity

of airports and air navigation services should not be described as privatization but rather as private participation or private involvement since the ownership control rests with the government.

Other research indicates the term “privatization” can refer to a broad range of activities that entail varying levels of private involvement. A report by the Government Accountability Office in 1995 stated that “the privatization spectrum can include contracting out, public–private partnerships, vouchers, and franchising, as well as the actual sale—divestiture—of government assets and operations”.

Most U.S. airports are operated as independent not-for-profit entities with oversight by a politically appointed authority or as a self-sustaining enterprise of a governmental entity such as a county, city, or state government. As it applies in the United States, privatization can refer to a broad range of activities that entail varying levels of private involvement in the operation of an airport including:

### ***Partial Privatisation***

National Governments creating corporatized ANSPs could float a percentage (less than 50% or more with a blocking majority) of the holdings to private corporations, airlines, Airports or banks to bring in investments in the form of equity. Equity is described typically in the capital market as the “most expensive” form of financing. Expected interest returns especially from the private capital market equity sector normally expect returns in investment capital of at least 7-10% minimum per annum (in reference to variable Interest Rates of the ECB).

Airport operators have explored many ways of doing business that involve varying degrees of private-sector involvement in the management, capital investment decision making, financing, and pricing of airport facilities and services. Private involvement at airports nationwide includes airline involvement in capital decision making, contracting of services to private companies, master concessionaire agreements, and private terminal development. For example, AMR (American Airlines’ parent company) developed, renovated, and financed Terminal 4 at Los Angeles International Airport with special facility bonds issued by AMR and backed by their lease payments.

### ***Full Privatisation***

Corporatized ANSPs could be privatized fully through placements or public offerings with strict supervisory controls imposed by the Ministry of transport or by an Independent regulator. The financing requirements under such circumstances will be shifted fully to the Private sector. Expectations of interest returns per year might in this case rise to (see previous financing method) over 10%.

It is important to note in this discussion that changes in governance or ownership such as those made during privatisation may impact the available sources of funding or financing for an entity. It is understood that there are current arrangements which constrain what airports and ANSPs are able to do in terms of funding and financing of new infrastructure and services.

### ***Other Variations of Ownership***

As mentioned before, one of the most notable developments over the past 10-20 years has been in the increase in private sector participation for infrastructure. Below are descriptions of non-traditional means of financing.

## Public-Private Partnerships (PPP)

As mentioned before, one of the most notable developments over the past 10-20 years has been in the increase in private sector participation for infrastructure.

### *Definition*

The term “public-private partnership” (“PPP”) has been in general use since the 1990s. However, there is no widely agreed, single definition or model of a PPP.

ICAO’s definition in Doc 9980 indicates PPP as an ownership and management structure in which the private and the public sectors both participate. PPPs refer to arrangements where the private sector supplies infrastructure assets and services that traditionally have been provided by the government. This technique provides private financing for infrastructure investment without immediately adding to government borrowing and debt, and can be a source of government revenue. PPPs also present business opportunities for the private sector in areas from which it was in many cases previously excluded.

General research shows that the term “PPP” covers a range of different structures where the private sector delivers a public project or service. Concession-based transport and utilities projects have existed in EU member countries for many years, particularly in France, Italy and Spain, with revenues derived from payments by end-users, e.g. road tolls. The UK’s Private Finance Initiative (“PFI”) expanded this concept to a broader range of public infrastructure and combined it with the introduction of services being paid for by the public sector rather than the end-users.

The use of PPPs has now spread to most EU member countries and depending on the country and the politics of the time, the term can cover a spectrum of models. These range from relatively short term management contracts (with little or no capital expenditure), through concession contracts (which may encompass the design and build of substantial capital assets along with the provision of a range of services and the financing of the entire construction and operation), to joint ventures and partial privatisations where there is a sharing of ownership between the public and private sectors.

The key contrast between PPPs and traditional procurement is that with PPPs the private sector returns are linked to service outcomes and performance of the asset over the contract life. The private sector service provider is responsible not just for asset delivery, but for overall project management and implementation, and successful operation for several years thereafter.

Whilst there is no formal agreed definition of PPP, the summary below (obtained from a Price Waterhouse Cooper’s) identifies a range of common meanings for the term PPP.

## Box 1 PPP Definitions

PPPs are aimed at increasing the efficiency of infrastructure projects by means of a long-term collaboration between the public sector and private business. A holistic approach which extends over the entire lifecycle is important here.

Source: German PPP Task Force, German Transport, Construction and Housing Ministry (Bundesministerium für Verkehr, Bauen and Wohnen)

The term public-private partnership (“PPP”) is not defined at Community level. In general, the term refers to forms of cooperation between public authorities and the world of business which aim to ensure the funding, construction, renovation, management and maintenance of an infrastructure of the provision of a service.

Source: Green Paper on Public-Private Partnerships and Community Law on Public Contracts and Concessions presented by the European Commission, April 2004

Standard & Poor’s definition of a PPP is any medium-to-long term relationship between the public and private sectors, involving the sharing of risks and rewards of multisector skills, expertise and finance to deliver desired policy outcomes.

Source: Standard & Poor’s PPP Credit Survey 2005

PPPs are long-term partnerships to deliver assets and services underpinning public services and community outcomes. Optimal structuring links private sector profitability to sustained performance over the long-term, yielding robust and attractive cash-flows for investors in return for delivering better value for money to the taxpayer.

Source: John Laing plc

‘Public-Private Partnership’ is a generic term for the relationships formed between the private sector and public bodies often with the aim of introducing private sector resources and/or expertise in order to help provide and deliver public sector assets and services. The term PPP is, thus, used to describe a wide variety of working arrangements from loose, informal and strategic partnerships, to design build finance and operate (DBFO) type service contracts and formal joint venture companies.

Source: European Investment Bank, The EIB’s role in Public-Private Partnerships, July 2004

(Source Price Waterhouse Cooper’s)

### *Advantage:*

PPP procurement is only one of several options for procuring infrastructure. Consideration must be given as to whether a project is suited to a PPP structure, and whether there is strong political support for a PPP solution.

The principal reason for using PPPs is that, where the project is suitable, they can deliver better value for money than the alternatives. All arguments for and against PPPs must be considered within the context of that overriding objective.

### Key advantages for using PPP procurement:

- PPPs make projects affordable
- PPPs maximise the use of private sector skills
- Under PPPs, the private sector takes life cycle cost risk (which can be passed on to captive users in monopolistic situations)
- With PPPs, risks are allocated to the party best able to manage or absorb each particular risk
- PPPs deliver budgetary certainty
- PPPs force the public sector to focus on outputs and benefits from the start
- With PPPs, the quality of service has to be maintained for the life of the PPP
- The public sector only pays when services are delivered
- PPPs encourage the development of specialist skills, such as life cycle costing
- PPPs allow the injection of private sector capital
- PPP transactions can be off balance sheet

Public-private partnerships are unlikely to fully replace traditional financing and development of infrastructure, but they offer several benefits to governments trying to address infrastructure shortages or improve the efficiency of their organizations. The five key points to note are:

First, public-private partnerships allow the costs of the investment to be spread over the lifetime of the asset and thus can allow infrastructure projects to be brought forward by years compared with the pay-as-you-go financing typical of many infrastructure projects.

Second, PPPs have a solid track record of on-time, on-budget delivery. This is debatable.

Third, PPPs transfer certain risks to the private sector and provide incentives for assets to be properly maintained.

Fourth, public-private partnerships can lower the cost of infrastructure by reducing both construction costs and overall life-cycle costs.

Fifth, because satisfaction metrics can be built into the contract, PPPs encourage a strong customer service orientation.

Finally, because the destination, not the path, becomes the organizing theme around which a project is built, public-private partnerships enable the public sector to focus on the outcome based public value they are trying to create.

### ***Challenges or Disadvantages***

- Does sufficient private sector expertise exist to warrant the PPP approach?
- Does the public sector have sufficient capacity and skills to adopt the PPP approach?
- It is not always possible to transfer life cycle cost risk
- PPPs do not achieve absolute risk transfer, especially in monopolistic situations where the risk can be transferred to captive users.
- PPPs imply a loss of management control by the public sector
- PPP procurement can be lengthy and costly
- The private sector has a higher cost of finance
- PPPs are long-term relatively inflexible structures

It is important to note that PPP may appear more expensive and if the project run into difficulty, risk has tendency to revert on the taxpayer.

Overall, PPP contracts balance the short term political imperatives and long term investment priorities. Getting PPP requires adequate resources on both sides of the partnership.

### **Institutional Lending or Subsidy based financing**

#### ***Direct Government Financing***

Where an ANSP is a government service, as in France or in Spain, the State could directly finance investments from Government budget.

However – beside capital projects with public grants– any additional loan based investment not covered by state reimbursement - will have the same need of capital cost repayment in future license or service charges like any other financing project.

#### ***Funding by Supra-National Bodies***

European Commission (EC) has funds like the TEN (Trans European Network) for funding transport networks of Civil Aviation, Railways etc. Under the Sixth Framework Programme EC funds are available for supporting Research. Some research funds are available within EUROCONTROL budget funded by the member States. For less prosperous areas within the European Union some Regional funding Instruments are available particularly under European Regional Development fund (ERDF).

## Leasing

Often Assets requiring large financial outlays are leased. This is frequently the case for aircrafts, Radars etc. The Leasing Company takes care of the financing costs but recovers it through annual charges throughout the life of the assets, which include both costs of principal and interest. The ownership remains with the leasing company and the charges are similar to rents. In other cases the assets could be bought at the end of a certain period of time. In some cases the asset may be bought by the stakeholder but then sold to the leasing company and rented back to ease cash flow.

The funding of such leases is similar to commercial loans.

ICAO Doc 9626 contains a description on this topic and indicates the practice of **aircraft leasing**, *i.e. the rental, rather than purchase, of aircraft by an air carrier from another air carrier or a non-airline entity*, has been growing steadily in the last two decades. The use of leased aircraft plays a significant role for airlines in the provision of international air services, reflecting in particular the economics and flexibility of leasing over purchasing (such as reducing initial cost burden or debt level, gaining tax benefits, and meeting seasonal demands for additional capacity). In a liberalized regulatory environment, leasing of aircraft facilitates the entry of new carriers into the market.

Information in ICAO Doc 9626 acknowledges that *there are various types of aircraft leases. They can be characterized by their purpose. A financial or capital lease is used by air carriers to avoid the otherwise substantial capital outlays/debt required in purchasing aircraft directly from the manufacturer, or to reduce taxation or other costs. For example, an air carrier may sell all or part of its fleet to a bank or other financial institution and then lease the aircraft back. Financial leases are long-term arrangements which give the outward appearance of ownership, e.g. the aircraft bears the air carrier's name/logo and is usually registered in the air carrier's State.*

*In contrast, an operating lease is designed to meet an air carrier's immediate need for additional aircraft, often on a seasonal or short-term basis. An air carrier with excess or under-utilized aircraft can lease them to other air carriers.*

### Operating Lease

Operating lessors either order aircraft from manufacturers or buy them from airlines and lease them back (this is known as sale/leaseback). The operating lessor leases the aircraft to the airline, which is also called the lessee.

Leases can be as short as a couple of months to cope with seasonal demand like summer tourist peaks, ski seasons or the Haj. Airlines can also lease crew and pilots with aircraft, these are known as wet leases.

However, most leases are for three to five years with airlines paying monthly lease rentals.

Airlines like operating leases as they give them more flexibility. They are however quite expensive.

Operating lessors expect to have to place an aircraft several times during its life. The aircraft often starts with a strong carrier and ends up in a developing country or as a cargo aircraft. Like airlines, lessors also need a lot of capital so are regular borrowers.

### *Definition*

A contract that allows for the use of an asset, but does not convey rights of ownership of the asset. An operating lease is not capitalized; it is accounted for as a rental expense in what is known as "off balance sheet financing." For the lessor, the asset being leased is accounted for as an asset and is depreciated as such. Operating leases have tax incentives and do not result in assets or liabilities being recorded on the lessee's balance sheet, which can improve the lessee's financial ratios.

Investopedia explains 'Operating Lease':

There are two primary types of leases: capital and operating. Capital leases are non-cancelable, and must meet at least one of the following requirements: the lease transfers ownership of the asset, the lease contains a bargain purchase option, the duration of the lease is 75% or more of the asset's expected economic life and/or the lease is worth at least 90% of the asset's value. An operating lease is one that meets none of the criteria.

### *Advantages*

Cancelable short-term (a period shorter than the economic life of the leased asset) lease written commonly by landlords and equipment manufacturers who expect to take back the leased asset after the lease term and re-lease it to other users. The lessor gives the lessee the exclusive right to possess and use the leased asset for a specific period and under specified conditions, but retains almost all risks and rewards of the ownership. The full amount of lease payments is charged as an expense on the lessee's income statement but no associated asset or liability (other than the liability of the accrued lease payment or rent) appears on the lessee's balance sheet. For this reason, operating leases are also called off balance-sheet financing. And, since the maintenance of the leased asset is usually the responsibility of the lessor, they are called also maintenance leases or service leases. An operating lease does not meet any of the criteria for a capital lease.

### *Disadvantages*

The key disadvantage to such leases is that ownership is retained by the lessor before and after the lease term.

## **Leverage Lease**

### *Definition*

A leveraged lease is an agreement where the lessor finances the lease by taking a loan from a lender. The party leasing the asset pays the lessor monthly. The lessor, in turn, remits the payments to the financing company. This allows the lessor to provide a lease and profit from the lease even if

the individual leasing the asset does not have the income to obtain the lease outright. In the perfect leveraged lease, all parties benefit from the arrangement.

A lease agreement that is partially financed by the lessor through a third-party financial institution. In a leveraged lease, the lending company holds the title to the leased asset, while the lessor creates the agreement with the lessee and collects the payment. The payments are then passed on to the lender.

In a leveraged lease, if the lessee stops making payments to the lessor, then the lessor stops making payments to the financial institution (lender). This allows the lender to repossess the property. The lessor may also have the right to retain the property upon lessee default, as long as the lessor continues making payments to the lender.

## **Sale/Lease Back**

### *Definition*

An arrangement where the seller of an asset leases back the same asset from the purchaser. In a leaseback arrangement, the specifics of the arrangement are made immediately after the sale of the asset, with the amount of the payments and the time period specified. Essentially, the seller of the asset becomes the lessee and the purchaser becomes the lessor in this arrangement.

A leaseback arrangement is useful when companies need to un-tie the cash invested in an asset for other investments, but the asset is still needed in order to operate. Leaseback deals can also provide the seller with additional tax deductions. The lessor benefits in that they will receive stable payments for a specified period of time.

### *Advantages*

One of the main benefits of the leaseback is that the arrangement can provide an influx of cash that a business may need for a specific purpose. By selling the asset, the funds from that sale can be directed toward the launch of a new product line, building a new facility, or some other project that is anticipated to benefit the business in some manner. Since the terms of the arrangement allow the seller to retain possession of the asset and use it in the course of business, the day to day operation remains the same, even as the cash from the sale makes it possible to pursue the new project.

There are a few additional benefits to the leaseback, in that the sold asset is no longer subject to taxes. This can have a beneficial impact on the tax burden carried by the seller, in that local and federal taxes may be reduced significantly. Those savings only add to the revenue that the company can use in other areas, increasing its chances for success.

Along with tax savings, the terms of the leaseback may also help to minimize maintenance costs. Assuming that the new owner takes on the responsibility for upkeep on the asset involved, this means that in the event of a breakdown, the owner not the user must cover the costs of repair. As with the tax breaks, this arrangement means even more money remains within the lessee's company and can be used for whatever purposes the company owners choose.

### *Disadvantages*

While there are a number of benefits to a leaseback, there are also potential drawbacks to consider. The new owner may be unwilling to renew the lease after the initial contract expires, or even entertain the possibility of selling the asset back to the original owner. Even if the lessor is open to the idea of renewing the lease, he or she may choose to increase the amount of the installment payments in the renewed agreement. If the asset used as part of the leaseback is essential to the operation of the lessee's business, then there may be no choice but to agree to the higher payments, a move that reduces the net profits for the operation.

## **Build, Operate, Transfer/ Build, Own, Operate/ Build, Transfer, Operate Models**

Build, Operate Transfer (BOT) and similar variations is a major startup business venture where private organizations undertake development and operation of a facility normally done by the government. The termination of the private sector involvement occurs at the return of the ownership of the facility to the government after a fixed concession period, usually 25 to 40 years

### *Advantages*

In the BOT approach, a private party or concessionaire retains a concession for a fixed period from a public party, called principal (client), for the development and operation of a public facility. The development consists of the financing, design and construction of the facility, managing and maintaining the facility adequately, and making it sufficiently profitable. The concessionaire secures return of investment by operating the facility and, during the concession period, the concessionaire acts as owner. At the end of the concession period, the concessionaire transfers the ownership of the facility free of liens to the principal at no cost.

## **Airport/ANSP Infrastructure Financing Schemes**

### **Non-aeronautical revenues**

Revenues from non-aeronautical activities have been used in varying degrees in recent years, more so in the airport domain to offset aeronautical costs.

To date, ANSPs have been slower to identify opportunities for non-aeronautical revenues. There are some ANSPs that have recovered costs through sales of publications (including aero-nautical publications) while other ANSPs have identified operational training as a source of additional revenue. Generally, airports have been faster to adopt non-aeronautical revenues compared with ANSPs.

### Non-aeronautical revenues used by airports

The information below summarizes some of the non-aeronautical sources of revenue used by airports:

**Airport parking revenues**—Parking has long been a revenue source for airport operators and further opportunities exist to enhance parking revenues by offering premium parking services, implementing parking operational enhancements, and collecting off-airport privilege fees.

- **Rental car revenues**—In addition to privilege fees and rentals, a Customer Facility Charge (CFC) is collected at some airports by each rental car concessionaire from its customers and used to pay all or a portion of the operating and capital costs of a consolidated rental car area or structured facility, and may include the cost of transportation to the terminals. For example, Albuquerque International Sunport imposed a CFC to finance the cost of a new consolidated rental car facility at the airport.

- **Terminal concessions**—Airport shoppers are recognized as a lucrative market, and airport retailing is evolving to meet that market. Concession sales have increased dramatically as airlines discontinue meal service and passengers arrive earlier. Airport operators have been able to maximize revenues through reinventing their terminal concessions programs by recognizing the customer, creating an inviting shopping experience, providing an accommodating dining opportunity, and branding. For example, Memphis International Airport's new concession program balances local favorites with major brands and provides guests with a sense of the city.

**Advertising programs**—With longer dwell times, airport customers now take the time to read advertisements. Modern airport advertising programs specialize in the sales and maintenance of advertising sites at airports by using technology, sponsorship opportunities, and nontraditional advertising locations.

- **Commercial development and land use**—Airport operators have generated revenue from a variety of revenue-producing leases from nonairline operations including manufacturing, warehousing, freight forwarding, and even farming on available airport land. Commercial development and land use has been done through coordinated planning efforts and mindful of FAA restrictions on land development. For example, Dallas/Fort Worth International Airport is in the process of developing natural gas and oil resources on airport land.

### **Other Forms of Airport Financing**

Airport operators use many other financial instruments to access and use the capital markets, including:

- Commercial paper,
- Bond anticipation notes (BANs),

- Grant anticipation notes (GANs),
- Pooled credit, and
- Capital leases.

### Commercial Paper

Commercial paper is a money market security that is generally not used to finance long-term investments, but rather to manage cash flow. It is commonly bought by money funds, and is generally regarded as a very safe investment. As a relatively low-risk option, commercial paper interest rates are low. Commercial paper can only be “out” for 270 days, but can be “taken out” with more commercial paper and ultimately is taken out typically with bond proceeds.

Commercial paper is used on a routine basis at some airports, particularly large airports and airports that operate independently as authorities, but is much more difficult at some airports, particularly those that operate as enterprise funds of a city, county, or state that have centralized financial management. Airport operators that routinely use commercial paper to manage cash flow include the operators of airports in Boston, Seattle, and San Francisco.

### Bond Anticipation Notes

BANs are short-term financing mechanisms that provide capital in advance of issuing long-term bonds. Various airports around the country have issued BANs, although commercial paper may be a more cost-effective way of managing cash flow for some airports.

### Grant Anticipation Notes

GANs are short-term financing mechanisms that provide capital in advance of receiving expected grants.

### Pooled Credit

Pooled credit is attractive for airport operators that have difficulty accessing the credit markets; however, few airport operators are actually in that situation, as most at a minimum can work with the city, county, or state that is the airport sponsor to issue GO debt. There are several examples of pooled credit for airports.

- American Association of Airport Executives (AAAE) Airport Capital Projects Loan Program—In December 2000, AAAE and the Capital Projects Finance Authority issued \$300,000,000 of Variable Rate Demand Revenue Bonds to fund the AAAE Airport Capital Projects Bond Loan Program. AAAE established the program to make low-cost, tax-exempt loans to eligible airports to finance improvements and equipment that constitute non-AMT governmental use projects under federal tax

law. The program offered airport operators a flexible and low-cost method of financing capital needs (Airport Capital Projects Loan Program 2001).

No loans were made under the program owing to several factors, including (1) changes in airport priorities away from capital development immediately after 9-11; (2) a limited number of projects that meet the eligibility criteria for tax-exempt financing (as mentioned in chapter four, terminal projects do not qualify and until a few years ago airfield projects did not qualify); and (3) the lack of difficulty that airport operators have in accessing the capital markets. According to AAE staff, the program was never formally ended, but is not active.

- Virginia Resources Authority's (VRA) Airport Revolving Revenue Fund—The VRA airport revolving fund pool includes 12 borrowers as of January 31, 2007. Approximately 65% of the \$70 million in outstanding debt is tied to the Capital Region Airport Commission, which runs the airport in Richmond, Virginia; therefore, Richmond's credit rating drives that of the entire pool. In August 2006, the credit rating for the VRA pool was upgraded by Fitch Ratings, based on Richmond International Airport's improved operating performance and enhanced stability in the overall airport sector since 2001 ("Virginia: VRA Airport Pool Upgraded" 2006).

### Capital Leases

Leasing capital equipment or facilities may also facilitate acquisition for airports that do not have adequate funding up front or cannot get the necessary approvals to issue bonds.

## **Airline/Aircraft Owner Financing Schemes**

Information from AirFinance Journal suggested that airlines typically use one, or a combination, of the following techniques to pay for their fleet:

### **1. Cash**

It is still the cheapest way to finance aircraft but only an option for profitable airlines (like Southwest) or state-owned ones with rich owners. Even then, the cash can usually be used for better purposes.

The other problem with financing all of the fleet with cash, is that during the downturn, when you need to release the cash, financing terms are much worse.

### **2. Operating leasing**

Similar to car hire. Operating lessors either order aircraft from manufacturers or buy them from airlines and lease them back (this is known as sale/leaseback). The operating lessor leases the aircraft to the airline, which is also called the lessee.

Leases can be as short as a couple of months to cope with seasonal demand like summer tourist peaks, ski seasons or the Haj. Airlines can also lease crew and pilots with aircraft, these are known as wet leases.

However, most leases are for three to five years with airlines paying monthly lease rentals.

Airlines like operating leases as they give them more flexibility. They are however quite expensive.

Operating lessors expect to have to place an aircraft several times during its life. The aircraft often starts with a strong carrier and ends up in a developing country or as a cargo aircraft. Like airlines, lessors also need a lot of capital so are regular borrowers.

### **3 Bank loans**

Just like mortgages. Banks lend money to airlines with the loan guaranteed by the aircraft. The bank can repossess the aircraft if the airline stops paying its loan.

Banks need to manage their risk so they often sell part of loans on to other banks. This is known as syndicating a loan. Loans are usually 12 years long.

A finance lease is similar to loans, except the bank then buys the aircraft from the airline (another sale/leaseback). The airline then makes monthly lease payments and at the end of the lease it owns the aircraft. Finance leasing is just like hire purchase.

Banks typically lend 85% of the aircraft's value with airlines paying 15% in cash. This 15% is known as equity.

### **4 Export credit loans**

It takes a lot of people to build an aircraft so aircraft manufacturers are very important to the countries there are based in. Governments realise this so to help aircraft exports they often guarantee loans. Kazakhstan Airlines, for example, may want to buy Boeing aircraft. Few banks, however, would be prepared to lend money to the airline as it does not make large profits and the country is viewed as risky. So the Export-Import Bank of the United States (Ex-Im Bank) will guarantee the loan.

A bank will lend the money to Kazakhstan Airlines but if the airline stops paying Ex-Im Bank will cover the bank's losses.

Airbus aircraft are made in France, Germany and the UK so each government covers the proportion made in their country. The French export credit agency is as Coface, the German agency is called Hermes and the UK has the Export Credits Guarantee Department or ECGD.

Export Development Canada handles bombardier loans and BNDES guaranteed Embraer exports.

Export credit loans cover 85% of the aircraft's value.

This type of finance is extremely important during a downturn when many banks stop lending.

### **5 Tax leases**

Governments always want their businesses to be as efficient as possible so their industries can compete with other countries. One way to improve efficiency is to have modern equipment, so governments encourage companies with tax breaks. Companies that buy equipment get to avoid paying tax on them (this is usually done through depreciation allowances).

The problem is airlines rarely make enough profits to benefit from these allowances. So airlines pass these benefits off to companies or individuals that have large tax bills by selling the aircraft and leasing them back.

In France and Spain only banks are eligible to buy aircraft. In Japan and US companies often take stakes.

Most investors only take 15% of the aircraft, with a bank (or group of banks) lending the rest as a loan. This is why they are often called leverage leases.

The main types of tax leases are: Japanese operating leases (JOLs) which most airlines can close; French Leverage Leases (FLLs), which are only allowed for French airlines; Spanish operating leases (SOLs) only for Spanish airlines; and US leverage leases.

## **6 Manufacturer support**

Most manufacturers do not like financing aircraft, but they accept that sometimes finance help it is needed to get a sale. Typical support could include the manufacturer leasing the aircraft on finance or operating lease, or guaranteeing the aircraft's value at the end of a lease or loan (this is known as a residual value guarantee). The easiest way to provide a residual value guarantee is to agree a price that the manufacturer will pay for the aircraft at the end of the loan.

## **7 EETCs: Enhanced Equipment Trust Certificates –**

These are bonds that airlines issue to pay for aircraft. The airline sets up a special purpose company or SPV (it's only purpose or business is to own the aircraft) that issues bonds to investors. The SPV then uses the cash from these bonds to buy aircraft through a sale/leaseback.

The airline then makes lease payments to the SPV and the SPV passes these on to the investors as bond interest.

## **8 Islamic leasing**

Shariah, or Islamic law, prevents lenders for charging interest. The main Islamic aircraft finance technique is Ijara or leasing (see Glossary for more details).

## **Financing by Manufacturers**

ATM System suppliers (often also Aircraft manufacturers) have an interest in the development of modern ATM Systems from both an equipment sales as well as capacity increase point of view. The Financing in this area result in cost of capital over the period and need to be recovered by product sales profit. Where Manufacturers or suppliers are provided with the specification of products, which would have, assured markets and guaranteed procurements they should be interested in the financing of implementation, which would ensure the procurement of such orders. ATM Master Plan would meet many of the requirements that Suppliers are looking for-clear specifications, assured markets (including inter-operability), large procurements. Therefore, they should be willing to finance some of the projects either through discounted pricing or participating in PPI initiatives. Avionics is a good example for such financing.

## 5. Workstream 4: Project Fundamentals and Financing Criteria

The information below begins to explore some areas for assessment when considering infrastructure or equipment upgrade projects. Included is a brief definition or explanation of the terms which has largely been sourced from Investopedia.

### Cost-benefit Analysis

Working Group 2 has developed a comprehensive amount of material relating to cost-benefit analysis and the processes and techniques involved.

### Risk

Large infrastructure projects suffer from significant under-management of risk in practically all stages of the value chain and throughout the life cycle of a project. In particular, poor risk assessment and risk allocation, for example, through contracts with the builders and financiers, early on in the concept and design phase lead to higher materialized risks and private-financing shortages later on.

Risk is also undermanaged in the later stages of infrastructure projects, destroying a significant share of their value. Crucially, project owners often fail to see that risks generated in one stage of the project can have a significant knock-on impact throughout its later stages.

The structuring and delivery of modern infrastructure projects is extremely complex. The long-term character of such projects requires a strategy that appropriately reflects the uncertainty and huge variety of risks they are exposed to over their life cycles. Infrastructure projects also involve a large number of different stakeholders entering the project life cycle at different stages with different roles, responsibilities, risk-management capabilities and risk-bearing capacities, and often conflicting interests. While the complexity of these projects requires division of roles and responsibilities among highly specialized players (such as contractors and operators), this leads to significant interface risks among the various stakeholders that materialize throughout the life cycle of the project, and these must be anticipated and managed from the outset.

And because infrastructure projects have become and will continue to become significantly larger and more complex, losses due to the cost of undermanaged risks will continue to increase. This will be exacerbated by an ongoing shortage of talent and experience—not only are projects more complex, but there are also more of them, which will create demand for more effective and more systematic approaches and solutions.

### Risk Management

Proper front-end project planning is all about shaping the project's risk profile so it can be managed during execution, and execution is all about aggressively mitigating the risks that emerge. The key is to know what risks are inherent to a project and what degree of freedom you have to shape the risk profile before you commit the bulk of your funds; you must also have skills in place to prevent the remaining risks from getting out of control. Then you can discuss what skills and processes are needed during front-end planning versus execution. In practice, they are quite different.

There is an inherent conflict between the aspiration to limit the number and volatility of potential future

(interface) risks and the need to maintain flexibility to respond to unforeseen changes over the life cycle of a project. The fact that risks can materialize in later stages, but have actually been caused in earlier stages under different responsibilities, requires an end-to-end risk-management view, as opposed to a siloed, individualized process-step responsibility. There is a clear need for strong risk-management processes from the outset and for these to be applied and continuously developed throughout the life of the project.

A state-of-the-art risk-management approach for infrastructure projects needs to reflect the peculiarities of the business. A good starting point is to undertake a forward-looking, life-cycle-oriented risk assessment and to generate insights into the root causes of identified and potential risks at the beginning of the project—in the project-origination and design phase. A true understanding of stakeholders' capabilities and willingness to take on and actively manage certain risks—the risk-ownership structure—and the respective allocation and pricing of these risks would be a logical next step. In addition, strategy and risk-related processes need to be strengthened, and the governance and organization—as well as the risk cultures—of all stakeholders need to be enhanced.

The involvement of risk-taking private-financing perspectives early on, for example, as applied in a PPP, can ensure a more professional and disciplined approach to strategy, risk and project management, and deal structuring.

To improve the successful provision of infrastructure projects, whether through PPPs or public procurement, all stakeholders across the value chain of an infrastructure project need to be subjected to rigorous private-sector risk-management, risk-allocation, and financing due diligence. They should also be required to contribute to the effective implementation of risk-management and mitigation capabilities across the life cycle of the project.

Assessing risks across a project's life cycle can be a powerful way of making it more resilient and ultimately more profitable for all of the participants across the value chain. This approach shares many elements with enterprise-risk-management (ERM) processes that are common in other sectors. Exhibit 3 provides an example of a generalized ERM framework.

Several concepts derived from ERM are applicable for infrastructure:

- f. Forward-looking, through-the-life-cycle risk assessment: management focus on a proactive, forward looking business-oriented performance dialogue on risk and return
- f. Risk ownership and strategy: a conscious optimization effort to protect and create value by allocating risks to the best risk owners across the life cycle, including an explicit reflection of the respective risk appetite of these risk owners, for example, private financiers
- f. Risk-adjusted processes: risk management as an institutionalized capability, integrated into important processes such as business-case planning, as well as through explicit risk processes like monitoring, control, and mitigation, with all stakeholder parties involved across the life cycle of the project
- f. Risk governance: risk management as a priority on top management's agenda, reflected in responsibilities and organizational design, for example, through an independent view on risk
- f. An explicit and effective "risk-return culture" within the control functions, but especially with project managers and in the project-execution force

## **Risk Analysis**

Risk analysis refers to the study of the underlying uncertainty of a given course of action. Risk analysis refers to the uncertainty of forecasted future cash flows streams, variance of portfolio/stock returns, statistical analysis to determine the probability of a project's success or failure, and possible future economic states. Risk analysts often work in tandem with forecasting professionals to minimize future negative unforeseen effects.

Almost all sorts of large businesses require a minimum sort of risk analysis. For example, commercial banks need to properly hedge foreign exchange exposure of overseas loans while large department stores must factor in the possibility of reduced revenues due to a global recession. Risk analysis allows professionals to identify and mitigate risks, but not avoid them completely. Proper risk analysis often includes mathematical and statistical software programs.

## **Risk Assessment**

The process of determining the likelihood that a specified negative event will occur. Investors and business managers use risk assessments to determine things like whether to undertake a particular venture, what rate of return they require to make a particular investment and how to mitigate an activity's potential losses.

Examples of formal risk assessment techniques and measurements include conditional value at risk-cVaR (used by portfolio managers to reduce the likelihood of incurring large losses); loan-to-value ratios (used by mortgage lenders to evaluate the risk of lending funds to purchase a particular property); and credit analysis (used by lenders to analyze a potential client's financial data to determine whether to lend money and if so, how much and at what interest rate).

## **Rate of Return**

According to Investopedia, the gain or loss on an investment over a specified period, expressed as a percentage increase over the initial investment cost. Gains on investments are considered to be any income received from the security plus realized capital gains.

A rate of return measurement can be used to measure virtually any investment vehicle, from real estate to bonds and stocks to fine art, provided the asset is purchased at one point in time and then produces cash flow at some time in the future. Financial securities are commonly judged based on their past rates of return, which can be compared against assets of the same type to determine which investments are the most attractive.

## **Return on Investment (ROI)**

Information from Investopedia indicates that a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. To calculate ROI, the

benefit (return) of an investment is divided by the cost of the investment; the result is expressed as a percentage or a ratio.

$$ROI = \frac{(\text{Gain from Investment} - \text{Cost of Investment})}{\text{Cost of Investment}}$$

In the above formula "gains from investment", refers to the proceeds obtained from selling the investment of interest. Return on investment is a very popular metric because of its versatility and simplicity. That is, if an investment does not have a positive ROI, or if there are other opportunities with a higher ROI, then the investment should be not be undertaken.

## Net Present Value

The difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyze the profitability of an investment or project.

The following is the formula for calculating NPV:

$$NPV = \sum_{t=1}^T \frac{C_t}{(1+r)^t} - C_0$$

where:

$C_t$  = net cash inflow during the period

$C_0$  = initial investment

$r$  = discount rate, and

$t$  = number of time periods

In addition to the formula, net present value can often be calculated using tables, as well as spreadsheets such as Microsoft Excel.

Determining the value of a project is challenging because there are different ways to measure the value of future cash flows. Because of the time value of money, a dollar earned in the future won't be worth as much as one earned today. The discount rate in the NPV formula is a way to account for this. Companies have different ways of identifying the discount rate, although a common method is using the expected return of other investment choices with a similar level of risk.

## Financial Structure and Debt Service Capability

### Debt Service

The cash that is required for a particular time period to cover the repayment of interest and principal on a debt. Debt service is often calculated on a yearly basis. Debt service for an individual often includes such financial obligations as a mortgage and student loans. Companies may have outstanding loans or outstanding interest on bonds or the principal of maturing bonds that count towards the company's debt service. An individual or company that is not able to make payments to service the debt can be said to be "unable to service (his/her/its) debt."

### Credit Rating

An assessment of the credit worthiness of a borrower in general terms or with respect to a particular debt or financial obligation. A credit rating can be assigned to any entity that seeks to borrow money – an individual, corporation, state or provincial authority, or sovereign government. Credit assessment and evaluation for companies and governments is generally done by a credit rating agency such as Standard & Poor's or Moody's. These rating agencies are paid by the entity that is seeking a credit rating for itself or for one of its debt issues. For individuals, credit ratings are derived from the credit history maintained by credit-reporting agencies such as Equifax, Experian and TransUnion.

Credit ratings for borrowers are based on substantial due diligence conducted by the rating agencies. While a borrower will strive to have the highest possible credit rating since it has a major impact on interest rates charged by lenders, the rating agencies must take a balanced and objective view of the borrower's financial situation and capacity to service/repay the debt.

The credit rating has an inverse relationship with the possibility of debt default. In the opinion of the rating agency, a high credit rating indicates that the borrower has a low probability of defaulting on the debt; conversely, a low credit rating suggests a high probability of default.

Credit rating agencies typically assign letter grades to indicate ratings. Standard & Poor's, for instance, has a credit rating scale ranging from AAA (excellent) and AA+ all the way to C and D. A debt instrument with a rating below BBB- is considered to be speculative grade or a junk bond.

Credit rating changes can have a significant impact on financial markets. A prime example of this effect is the adverse market reaction to the credit rating downgrade of the U.S. federal government by Standard & Poor's on August 5, 2011. Global equity markets plunged for weeks following the downgrade.

For individuals, the credit rating is conveyed by means of a numerical credit score that is maintained by Equifax, Experian and other credit-reporting agencies. A high credit score indicates a stronger credit profile and will generally result in lower interest rates charged by lenders.

## **Credit History**

A record of a consumer's ability to repay debts and demonstrated responsibility in repaying debts. A consumer's credit history consists of information such as: number and types of credit accounts, how long each account has been open, amounts owed, amount of available credit used, whether bills are paid on time, and number of recent credit inquiries. It also contains information regarding whether the consumer has any bankruptcies, liens, judgments or collections. This information is all contained on a consumer's credit report.

## 6. Case Studies

This report also includes references to a number of case studies relevant to aviation. Whilst ACI has largely sourced information specific to airports, this list includes some information on airline or aircraft financing. It is anticipated that more case studies will become available from other areas of the industry.

### Air Navigation Service Providers Case Studies

#### NAVCANDA

<http://www.navcanada.ca/EN/about-us/Financial%20Information/MDA-Q4-2013-EN.pdf>

<http://www.navcanada.ca/EN/media/Publications/Test%20of%20Time-EN.pdf>

### Airport PPP Case Studies

#### Bangalore and Delhi Airports

[http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&ved=0CEAQFjAF&url=http%3A%2F%2Fcleanairinitiative.org%2Fportal%2Fsystem%2Ffiles%2Fpresentations%2FJohn\\_Duffy\\_-\\_HSH\\_Nordbank\\_ADB\\_Transport\\_Forum\\_PPP\\_in\\_Air\\_Transport.pdf&ei=buxkVMyRKNTfsASr0IHQBA&usg=AFQjCNFUfNYWELKD6v2TQy7FM6e-lbJpBQ&bvm=bv.79189006,d.cWc](http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&ved=0CEAQFjAF&url=http%3A%2F%2Fcleanairinitiative.org%2Fportal%2Fsystem%2Ffiles%2Fpresentations%2FJohn_Duffy_-_HSH_Nordbank_ADB_Transport_Forum_PPP_in_Air_Transport.pdf&ei=buxkVMyRKNTfsASr0IHQBA&usg=AFQjCNFUfNYWELKD6v2TQy7FM6e-lbJpBQ&bvm=bv.79189006,d.cWc)

#### Queen Alia Airport – Jordan

[http://www.ifc.org/wps/wcm/connect/73c497804983917d84ccd6336b93d75f/PPPStories\\_Jordan\\_QueenAliaInternationalAirport.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/73c497804983917d84ccd6336b93d75f/PPPStories_Jordan_QueenAliaInternationalAirport.pdf?MOD=AJPERES)

#### Male International Airport

<http://www.pidg.org/resource-library/case-studies/successstories-maleairport.pdf>

### PPP Case Studies in other sectors

<http://ppp.worldbank.org/public-private-partnership/sector>

[http://www.oecd-ilibrary.org/transport/better-regulation-of-public-private-partnerships-for-transport-infrastructure\\_9789282103951-en](http://www.oecd-ilibrary.org/transport/better-regulation-of-public-private-partnerships-for-transport-infrastructure_9789282103951-en)

### Airline Aircraft Leasing or Equipment Funding

#### Air Canada 787

<http://www.aircanada.com/en/about/media/presentations/documents/JP-Morgan-Miami-Feb24-2014.pdf>

#### Korean Air Leasing

<http://dspace.mit.edu/bitstream/handle/1721.1/39522/173983447.pdf>

### Brisbane Airport Parallel Runway Project – Pre-Funding



## 7. Appendix 1

### Summary of Financing

Method of Financing	Types of Expenditures financed
<b>1. Loan or Borrowing Based</b>	For meeting short-term (1 to 5 years) Working Capital requirements or for short term bridging loans. Most ANSPs use this method of financing. A more commercial version is sale and lease back of large assets often used by ANSPs and Airlines.
<b>2. Institutional Lending or subsidized Loans</b>	To finance Medium-term (8 to 10 years) Capital projects. The Projects are clearly documented with detailed costs and where meaningful with Cost Benefit analyses and showing how the financing costs would be refunded over the period of the loan. Typical use is for ATM installations like Radars or purchase of aircrafts. It could also be in the form of securitisation of part of future Revenue streams for up front Project funds (Greece has used it in the past).
<b>3. Grants or Non-Repayable Loans</b>	Medium to large Projects to meet broader economic or social objectives of National Governments and/or Pan European Organisations. This type of financing could be for modernisation or upgrading of small or medium airports. Increasing Security arrangements or for undertaking multi-state projects which would benefit the States undertaking the Project.
<b>4. Equity Based</b>	To bring in private sector capital and to broaden stakeholder participation. Although States are responsible for the provision of Safe ATM services often the high costs of such services prompt States to create Corporatised Service Providers, which could raise funds more easily through issue of equity rather than through government taxes. This type of financing introduces a form of sharing of Risks and Rewards. Often the Equity issued does not represent 100% of the value as Governments wants to retain some control over the future strategy of the organisations United Kingdom NATS and DFS in Germany is following this route.
<b>5. Private Public Initiatives</b>	Large Projects with clear paybacks in terms of making profits directly or indirectly through reduction of costs payable in the future by the parties concerned. The type of Projects would include building of a New Airport or extension of a large airport or a Complete new ATM facility.

## 8. Appendix 2

### Additional Input from Europe

#### Information from Europe

##### Investments in modernisation of ATM

Airlines, ANSPs and airports are investing money in maintaining and renewing their equipage and systems. In particular for new investments plans are made and business cases, as explained in the previous chapter of the MDWG-report on business cases and CBA.

Several methods of financing exist, as explained in the previous paragraph. ANSPs and airports can be owned by States and financing may go through the State budgets, although many state-owned ANSPs and airport finance their equipage and systems in a similar way as a private company.

However to achieve implementation of the ASBU, a structure of actions is needed, in particular in more complex situations in which several States and ANSPs should be involved to make the total business case positive, while investments have to be brought up by each individual party in a project. The business case is less or not positive for each of them or not at the same moment when starting the modernisation. To avoid that everyone is waiting to each other or to avoid that less participants are involved to reach a more ideal situation, related to the expected benefits, additional financial support can be considered. This is therefore not just applying financial instruments or making finances available (which in itself helps of course), but more has to be done.

In a view of a manufacturers' perspective in financing ATM infrastructure for SESAR deployment, AIRBUS made the following observations.

All the technologies available on board and on the ground have to be used and integrated to alleviate the burden of pilots and controllers and give them the capacity to manage the flights with the best possible efficiency as regards safety and capacity, but also taking into account economic and environmental aspects. This is the objective of programmes like SESAR and NextGen. However initial invest required are very high and if the industry involved in this ATM transformation is ready to commit to it, financing or funding of the initial invests is a critical issue for a quick and efficient deployment of SESAR equipment.

Among the risks identified are:

- Not having coordinated deliveries :, resulting in low performance or extra costs
- Not being able to deliver on right time with performance and price expiated
- Airspace users not purchasing airborne equipment or ANSPs not investing in relevant infrastructures.

To mitigate risks on SESAR deployment, it was advised to develop:

- Governance: a very strong and efficient governance has to be set up;
  - On *industry* side to

- Coordinate actions of the main investors (especially between ANSP and aircraft manufacturers for coordination between on the ground and airborne equipment)
  - Focus on priorities delivering real and quick benefits to the airspace users
  - Ensure quick and reliable validation and certification process
  - Integrate SESR objectives in the industrial processes and economic constraints and commit to them
  - Ensure interoperability with others, like NextGen
- On *institutional* side to:
  - Engage EU authorities and states to make SESAR deployment one of the major programs for the period 2013 – 2020
  - Ensure appropriate governance and funding of SESAR deployment at institutional level
  - Set up appropriate Implementing Regulation or incentives
- Financing:
  - A financing of the governance structures and a support to early invest has to be setup to launch the program and allow a quick implementation of on the ground and airborne equipment with no dissuasive "entry costs" for the airlines as they would get the whole benefit of SESAR only at the end of the deployment.

In the next paragraph mechanisms are described that are under development in Europe. This however doesn't say that other states in other regions have to develop similar mechanisms. This information is just to illustrate the investment strategies.

### **3.4. SESAR Deployment**

In Europe the European Union (EU) has developed its policy for a Single European Sky (SES). The following information is related to the EU policy on the Single European Sky (SES). SESAR is the technological pillar of the SES. SES is a policy, supported by regulation and operational arrangements to improve a better performance of the capacity, efficiency, safety and environmental benefits of the ATM system in Europe. The 28 EU member States mandated the EU to develop SES policy and regulation. The European Commission is the executive body of the EU with the exclusive right to propose EU regulation. EU regulation, once approved, is binding for the EU member States. SES is not only applied for the 28 EU member States, but also to several other European States with agreements with the EU to apply the Single European Sky (SES) policy in their State.

#### Route charges

Europe is applying route charges, based on the ICAO principles. The European Union is mandated by its States to develop the Single European Sky policy, including a set of regulations that are mandatory for the States to implement. The route charges are based on European Commission Regulation (EU) No 391/2013 of 3 May 2013 laying down a common charging scheme for air navigation services; in combination with European Commission Regulation (EU) No 1191/2010 of 16 December 2010 amending

Regulation (EC) No 1794/2006 laying down a common charging scheme for air navigation services. This regulation is mandatory for EU Member States. The notion of incentives is incorporated in this regulation.

States, at national or Functional Airspace Block level, may, on a *non-discriminatory* and *transparent* basis, establish or approve incentive schemes to support improvements in the provision of air navigation services or the reduction of the environmental impact of aviation (*this relates to the KPAs applied in the performance scheme in Europe, based on the KPAs of ICAO, but simplified*).

Those incentives may apply to *air navigation service providers* or *airspace users*.

States, at national or functional airspace block level, may adopt financial incentives for the *achievement of performance targets* by their air navigation service providers. This means, they can apply an incentive scheme with respect to users of air navigation services in order to:

- e) optimise the use of air navigation services;
- f) reduce the environmental impact of flying;
- g) reduce the overall costs of air navigation services and increase their efficiency, in particular by decreasing or modulating charges according to airborne equipment that increases capacity or offsetting the inconvenience of choosing less congested routings;
- h) accelerate the deployment of SESAR ATM capabilities.

Incentives as part of a bigger framework of implementing/deploying new concepts and new techniques to modernise ATM and if so, how is this related to the ICAO GANP/ASBU:

- The common charging scheme should be an integral element in reaching the objectives of the performance scheme;
- the charging scheme should promote cost and operational efficiencies and should provide for the establishment of incentive schemes for air navigation service providers to support improvements in the provision of air navigation services, including the application of traffic risk sharing.
- The common charging scheme should be consistent with the EUROCONTROL Route Charges System and Article 15 of the 1944 ICAO Chicago Convention on International Civil Aviation (the 'Chicago Convention').

#### Role of performance plans: Conditions

The performance plans should describe the measures, such as incentives schemes, aimed at driving the behaviour of stakeholders towards improving performance at national, functional airspace block and European levels. To realise the plans, the implementation of binding performance targets is envisaged, supported by incentives that can be of financial nature requires appropriate link with the common charging scheme for air navigation services.

The performance plans shall contain, in particular:

- performance targets in each relevant key performance area, set by reference to each key performance indicator, for the entire reference period, with annual values to be used for monitoring and incentive purposes;
- a description of the incentive mechanisms to be applied on the various accountable entities to encourage achievement of the targets over the reference period;

The incentive schemes applied by Member States as part of their performance plan, shall comply with the following general principles:

- a. they shall be effective, proportional, and credible and shall not be changed during the reference period;
- b. they shall be implemented on a non-discriminatory and transparent basis to support improvements in the performance of service provision;
- c. they shall be part of the regulatory environment known ex ante by all stakeholders and be applicable during the entire reference period;
- d. they shall drive behaviour of entities subject to target setting with a view to achieving a high level of performance and meeting the associated targets.

The application of incentives varies with the different performance areas:

- Incentives on safety targets shall aim at encouraging that required safety objectives are fully achieved and maintained while allowing for performance improvements in other key performance areas. They shall not be of financial nature and shall consist in action plans with deadlines and/or associated measures
- Incentives on cost-efficiency targets shall be of financial nature and shall be governed by appropriate provisions. They shall consist in a risk-sharing mechanism, at national or functional airspace block level.
- Incentives on capacity targets may be of financial nature or of other nature, such as corrective action plans with deadlines and associated measures, which may include bonuses and penalties, adopted by Member States.
- Incentives on environment targets shall aim at encouraging the achievement of required environmental performance levels while allowing for performance improvements in other key performance areas. They shall be of financial or non-financial nature and shall be decided by Member States taking account of local circumstances.
- Member States, at national or functional airspace block level, may establish or approve incentives schemes on airspace users.

### Common projects

Another element is that governance is required for a proper implementation. In Europe for most projects (comparable with the ICAO ASBU) several States and Air Navigation Service Providers are and should be involved to get the best contribution to a better performance, but also to reach economies of scale. This should fall within a framework, the European ATM Master Plan that is aligned with the ICAO ASBU. As this work cannot be done at random, the notion of common projects has been developed, supported by regulation to define working with common projects. As a start Pilots are made, the Pilot Common Projects.

The regulation requires that the common projects must be consistent with the ATM Master Plan and contribute to increasing performance. It combines funding and financing mechanisms. The objective is to ensure timely and synchronised deployment of enablers critical to the performance of the network.

The philosophy is based on:

- ATM Master plan: providing the Planning view
- The common project is providing the business view
- The deployment programme is providing the project view.

### Conditions for working with common projects and the support by incentives

Incentive mechanisms for the deployment of SESAR (Single European Sky Air Traffic Management Research and development) include common projects, which should assist the successful implementation of the European ATM Master Plan. Guidance is provided on common projects, which should establish a binding framework on how common projects can support the implementation of the ATM Master Plan. Governance mechanisms are required which should ensure timely, coordinated and synchronised deployment by setting out a clear allocation of responsibilities amongst stakeholders.

A timely, coordinated and synchronised deployment of SESAR is essential to achieve the SES performance objectives and the overall economic benefits expected from ATM modernisation.

Common projects should help boost the performance of the European ATM network (EATMN) and demonstrate overall positive cost-benefit analysis, mindful of any potential negative impacts for specific regions or stakeholders.

In order to ensure that common projects are implemented and monitored in a timely, coordinated and synchronised manner, making optimal use of the instruments and bodies identified in the single European sky regulatory framework, a governance of SESAR deployment is developed. In order to govern SESAR deployment effectively and ensure credibility of the deployment process, the operational stakeholders accountable for the performance of the ATM system should be involved in deployment governance. Operational stakeholders investing in SESAR deployment should play a leading role in managing and implementing deployment activities, preferably through a single entity, while avoiding any conflict of interest.

Common projects shall aim to deploy in a timely, coordinated and synchronised way ATM functionalities that will achieve the essential operational changes. Common projects shall be consistent with and contribute to the European Union-wide performance targets. Common projects shall identify the ATM functionalities that:

- a. having reached the appropriate level of industrialisation, are mature for implementation;
- b. require synchronised deployment.

Common projects will identify incentives that best support the deployment of their functionalities. They can be of different nature.

The European Commission should oversee deployment activities making sure they follow the SES objectives and safeguard the public interest, by establishing appropriate reporting and monitoring mechanisms making the best use of existing instruments such as the European and Local Single Sky Implementation (ESSIP Plan and Report and LSSIP documents).

### Deployment Manager

Regulation has been approved to appoint a Deployment Manager, for which parties, which an interest in the aviation system, can apply in a call for tender to become the deployment manager.

### Applying financial instruments

The main incentives from the EU will be grants from the **Connecting Europe Facility** ( or CEF), which is the financial instrument for the new Trans-European Network (TEN-T) programme, in favour of implementation projects. CEF is developed for all transport modes, not only for aviation.

EU Grants (Now and in future) have to fall withing:

- under Connecting Europe Facility (CEF)
- for implementation projects coordinated by the Deployment Manager (DM)

The European Commission (EC) has an amount of about EUR 3 billion reserved for SEAR deployment in the 2014-2020 multi-annual financial framework. Most of this amount will be dedicated to the implementation of Common Projects.

EC is also investigating other forms of incentives, in particular through existing mechanisms in the SES framework, such as the modulation of route charges. Different aspects are taking into account:

- legal basis: EU Charging Regulation, Article 16(2)
- possibility: EU funding for reduction of ANS charges to directly benefit airspace users
- study on-going by the Commission on charging policy, including modulation of charges; results: end 2014

EC is discussing with the EIB possible loan mechanisms for SESAR deployment.

The funding rates under the CEF are 50% for studies and for implementation projects: 20% of eligible costs for airborne equipment and 50% for ground equipment.

In order to ensure synchronisation of the deployment of the ATM functionalities identified in the Common Projects, the Commission does not intend to award any financial aid for the deployment of the Pilot Common Projects or future Common Projects that are not compliant with the Deployment Programme or that are not under the coordination of the Deployment Manager.

The CEF can support a multitude of actions comprising purchase, supply and deployment of components, systems and services, construction and installation activities and activities needed to prepare project implementation from feasibility to validation studies, including software and other technical support measures to define and develop projects and decide on their financing.

The CEF can be implemented through one or more forms of financial aid, in particular, **grants, procurements and financial instruments** such as:

- **investment funds** with a focus on providing risk capital for actions contributing to projects of common interest;
- **loans and/or guarantees** facilitated by risk-sharing instruments, including enhancement mechanism to project bonds.