



International Civil Aviation Organization

MID Region AIS Database Study Group

**First Meeting (MIDAD SG*/1)
(Cairo, Egypt, 20 – 22 February 2012)**

Agenda Item 7: MIDAD Financial Plan/Funding Mechanism

FINANCIAL MODEL

(Presented by MIDAD Support Team)

SUMMARY

This working paper provides some thoughts about a possible Financial Model for MIDAD. The paper is completely based on the ICAO Global ANP (Doc 9750-AN/963, 3rd Edition – 2007) and tries to map the philosophy and principles of that document to the MIDAD development and implementation.

Action by the meeting is at paragraph 3.

REFERENCES

- AIS/MAP TF/6 Report
- ATM/SAR/AIS SG/12 Report
- DGCA-MID/1 Report
- ICAO Aviation Systems Block Upgrades B0-30
- ICAO Strategic objective “Safety (A2)” and “Environment ...” (C31)”

1 INTRODUCTION

1.1 The Terms of Reference of the MIDADSG requests, inter-alia that the Study Group monitors and provides guidance for a MIDAD financial model.

1.2 It should be considered that the financial model shall include the Continuous Operational Cost Recovery, a Cost Benefit Analysis, and Future Cost Benefits.

2 DISCUSSION

2.1 ICAO Approach

2.1.1 For the further work on the Financial Model the Appendix E “Cost-Benefit and Economic Impacts” and Appendix F “Financial Aspects” of the ICAO Global ANP (Doc 9750-AN/963, 3rd Edition 2007) shall be used as guidance material by the MIDAD SG. This paper is based on that two Appendices.

2.1.2 The text below is therefore heavily taken from this document and tries to relate the ICAO approach to the MIDAD where it seems to be relevant.

2.2 Cost-Benefit Methodology

2.2.1 The cost-benefit analysis is used to estimate the economic viability of the planned MIDAD investment project, i.e. the extent to which the total benefit from the investment exceeds the total cost. The MIDAD is complex and consists of a package of investments. Measures of the viability of the new investment package (the project case) are based on a comparison with the existing systems (the base case). The existing systems are defined to include their normal and expected maintenance and possible development over the planning horizon. The new facilities replace the existing facilities, and as the latter are phased out, the reduction in their costs can be regarded as benefits from installing the new systems. The most important benefits of the MIDAD are the cost reductions from more efficient flight operations, reduced flight times, and enhancing safety and security which are expected to emerge as MIDAD is implemented.

2.2.2 A rigorous approach to developing a measure of the expected economic performance of an investment project is the net present value (NPV) or life-cycle approach, which focuses on the annual flows of costs and benefits (cash flows) related to the project. The costs and benefits in cash flow terms are not distributed evenly over time. Typically, there are large capital expenditures in the early years of a new project followed by many years of benefits, and also of operating and maintenance costs. There could be significant costs during the period of transition from the existing to the new systems, and these must be included in the analysis. The benefits will normally be in the form of cost savings. The net benefit in each year is equal to the sum of all the benefit items minus the sum of all the cost items expected in that year. The NPV (i.e. current year capitalized value) of the stream of net benefits (net cash flows) can be determined by a process of discounting the future cash flows. This process takes into account the effect of the rate of interest on the present value of each future cash flow.

2.2.3 Estimation of the future flows of the costs and benefits, and hence the NPV associated with the implementation of the MIDAD requires many assumptions about the prices and quantities of communications, equipment, services, and about the amount of potential savings in aircraft operating costs. Therefore, there is an element of uncertainty and risk in the NPV results. The financial risks can be appreciated by studying the effects on the NPV estimate resulting from changes in the assumptions. A particularly important assumption is that the transition to the MIDAD by the MIDAD provider and its owners (the MID States) and aircraft operators occurs in a coordinated fashion so that net benefits are maximized.

2.2.4 Comprehensive guidance material to assist States in carrying out cost-benefit studies of the implementation of CNS/ATM systems was made available by ICAO in relation of Economics of Satellite-based Air Navigation Services in Circular 257. This circular focuses on the NPV methodology, which is widely recognized and used by financial institutions such as those potentially involved in funding MIDAD.

2.3 Business Case Evaluation

2.3.1 The development of a business case for the implementation of the MIDAD systems by a service provider or an operator (owned by the MID States) involves taking the financial cost-benefit analysis a step further. In particular, changes in revenues resulting from changes in the price of the product/services sold must be taken into account. It is generally expected that the MIDAD systems will facilitate reduced operating costs and a lower price for the service provided. From the point of view of a specific organization, assessment of the net financial impact, in present value terms, must include not only the implementation cost and operating cost savings, which are included in the cost-benefit analysis, but also consequent changes in revenues.

2.3.2 For a service provider, a business case evaluation must include the impact on revenues of changes in charges associated with the implementation of the MIDAD systems. Assuming that the MIDAD service provider is an autonomous organization (owned by the MID States) operating on a commercial basis and is currently covering its costs with the present technology systems, the basic issue is for the service provider to be satisfied that the changes in revenues expected from the planned changes to AIS charges will match the net change in costs, measured by the cost-benefit analysis. However, if the relationship between costs and revenues is not being monitored (e.g. if costs are met from the government budget and revenues are treated independently as general government revenues), then the MIDAD services are not being provided on a commercial basis. Even in these circumstances it is recommended that a business case evaluation be conducted to assess the financial impact of the new systems on the service provider.

2.3.3 For an airline and other airspace users, a business case evaluation would include, among other factors, assumptions about the impact on its costs of expected changes in route charges and operating costs and the impact on revenues of changes in airline fares and rates or operating cost of other airspace users (like business aviation, military, etc.), where these changes are associated with the implementation of the MIDAD systems. These impacts are in addition to the direct investment costs and operating cost savings attributable to the new MIDAD systems and identified in the cost-benefit analysis described above.

2.3.4 The MIDAD SG could consider to use or at least to check whether the ICAO CNS/ATM Business Case Analysis Tool (DFACS)¹ can be used to assist the Financial Model.

2.3.5 The MID ICAO Regional Traffic Forecasts (Doc 9879 and 9915) shall be considered as input to the Financial Model to underline the necessity to build the MIDAD system. This report contains long-term air traffic forecasts for the major route groups to, from and within ICAO Regions, in terms of both passengers and aircraft movements. It also contains movement forecasts at city-pair level for the top 25 city-pairs.

2.4 Other Economic Effects

2.4.1 States may be interested in the broader economic and social impact of the MIDAD systems as well as the financial viability of the new systems. For example, implementation of the new systems should produce passenger time savings, improve safety, produce environmental benefits and may also lead to some industry restructuring and changes in skills required.

2.4.2 CNS improvements, which produce benefits for ATM such as more direct flight paths and less delay from airspace congestion, will reduce the passenger travel time for a given journey. If passengers value these time savings, they represent an additional benefit.

2.4.3 An understanding of the contribution of air transport to general economic activity can increase the political commitment to the process of transition to the MIDAD systems. National accounting and industry data and employment surveys may be used to determine the share of air transport in total economic activity and its importance as an employer. The input/output tables of a State's national accounts can illustrate the interrelationships among the various elements of the air transport industry and other industries and economic sectors. Other industries purchase air transport services or supply products and services to the air transport industry. From a national or regional economic planning perspective, it is especially important to appreciate the role of air transport in generating employment and incomes and in supporting other non-aviation economic activities. This will put into perspective the value of supporting and investing in state-of-the art national and regional air transport facilities.

¹ ICAO Catalogue 2007, CD-109.

2.4.4 Summary of Economic Effects of CNS/ATM

1. Financial benefits and lower fares and rates;
2. Improved safety;
3. Passenger time savings;
4. Environmental benefits,;
5. Transfer of high-tech skills,;
6. Productivity improvements and industry restructuring; and
7. Higher traffic and stimulation of related industries.

2.5 ICAO Policy on Cost Recovery

2.5.1 Whatever approach is taken by a State or group of States collectively to provide the MIDAD systems services within the airspace for which responsibility has been assumed, the resultant cost recovery through charges must be in conformity with basic ICAO policies on charges for airports and air navigation services. This policy is contained in Article 15 of the Chicago Convention and is supplemented by ICAO's Policies on Charges for Airports and Air Navigation Services (Doc 9082/8). The implementation of the MIDAD systems should not require any basic changes to that policy.

2.5.2 ICAO's commitment in the field of airport and air navigation services charges has its principal origin in Article 15 — Airport and similar charges, of the Convention on International Civil Aviation (Doc 9082).

2.5.3 In ICAO's policies set out in Doc 9082, the following four general principles should particularly be noted with regard to CNS/ATM systems:

in paragraph 42, "... as a general principle, where air navigation services are provided for international use, the ANSPs may require the users to pay their share of the related costs; at the same time international civil aviation should not be asked to meet costs which are not properly allocable to it. ..."

paragraph 44 i), "The cost to be shared is the full cost of providing the air navigation services, including appropriate amounts for cost of capital and depreciation of assets, as well as the costs of maintenance, operation, management and administration";

in paragraph 44 ii), "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) . . ."; and

in paragraph 53, "... the providers of air navigation services for international use may require all users to pay their share of the cost of providing them regardless of whether or not the utilization takes place over the territory of the provider State."

2.5.4 Particular attention also needs to be given to the following principle in paragraph 47 iii) of Doc 9082: "Charges should be determined on the basis of sound accounting principles and may reflect, as required, other economic principles, provided that these are in conformity with Article 15 of the Convention on International Civil Aviation and other principles in this document."

2.5.5 In ICAO's policies on charges, pre-funding of projects is considered as a possible source of financing and the following policy guidance is included in paragraph 48 of Doc 9082: "... notwithstanding the principles of cost-relatedness for charges and of the protection of users from being charged for facilities that do not exist or are not provided (currently or in the future) that, after having allowed for possible contributions from non-aeronautical revenues, pre-funding of projects may be accepted in specific circumstances where this is the most appropriate means of financing long-term, large-scale investment, provided that strict safeguards are in place, including the following:

- (i) Effective and transparent economic oversight of user charges and the related provision of services, including performance auditing and "bench-marking" (comparison of productivity criteria against other similar enterprises).
- (ii) Comprehensive and transparent accounting, with assurances that all aviation user charges are, and will remain, earmarked for civil aviation services or projects.
- (iii) Advance, transparent and substantive consultation by ANSPs and, to the greatest extent possible, agreement with users regarding significant projects; ...".

2.6 Cost Determination

2.6.1 Charges for the MIDAD systems services should not be imposed unless these services are actually being provided according to the regional ANPs concerned. Consequently, it is important that regional plans be promptly amended to incorporate the MIDAD once the States involved have agreed that the element(s) should form part of the plan or plans concerned.

2.6.2 The regional ANPs should provide a schedule for the phase-out of facilities made redundant by the provision of the MIDAD systems services. This is also of major importance because significant financial benefits from MIDAD systems implementation will not be realized if the facilities and services made redundant continue to be listed in the regional plans and charged for.

2.6.3 As MIDAD systems components are implemented, the costs are added to the costs of the MIDAD multinational system and service cost base for charges.

2.6.4 From an organizational viewpoint, it is important, with regard to cost recovery of the MIDAD system and services costs, the States concerned should assign, to one entity, the responsibility for ensuring that the costs attributable to the provision of MIDAD systems and services by the different entities in the States are included in the cost basis for any cost-recovery programme or mechanism. This assignment can be made to the MIDAD services provider.

2.6.5 Costs, in the form of payments made by a State to the service provider offering MIDAD systems services, will need to be allocated amongst the different participating States, which are potentially all MID States. That, in turn, will require an agreement between the parties concerned as to how such an allocation should proceed. Assuming a uniform level of service, such allocation could be based on either distance flown or the number of flights in the airspace for which each State has accepted responsibility, or others. Both are viable options. Distance flown would offer more precision while using number of flights as the basis would be simpler to administer. Other schemas could relate number of airports to be provided or similar.

2.7 Cost Recovery during Development and Implementation

2.7.1 One particular issue that needs to be addressed in the implementation of the MIDAD systems is the treatment of costs and cost recovery during the three initial stages: (1) Set-Up Phase, (2) Call for Tender Phase, (3) Implementation Phase.

2.7.2 The implementation of the MIDAD systems will, in some cases, lead to the retirement of existing AIS facilities before the end of their economic life. In such circumstances, the balance of the undepreciated portion of the facilities concerned could be included in the cost basis for charges. The same procedure could apply to such costs that may be incurred because of premature retirement or training of personnel made redundant by the implementation of the new systems. Such costs, however, should be limited to termination settlements, costs attributable to early retirement and costs of retraining and/or relocation. These costs could be capitalized and thereafter written off gradually, with the portion written off each year being included in the cost basis for charges. These factors would need to be taken into account in any related cost-benefit analysis or business case study.

2.8 Consultation with Users

2.8.1 Particular attention should be drawn to Doc 9082, paragraphs 23 to 26, and the emphasis placed on (direct) consultation with users regarding increased or new air navigation services charges, where AIS charges are part of it; and also on users being consulted as early as possible when major air navigation services are being planned. This would call for such consultations to be carried out when plans are being developed for the implementation of the MIDAD systems.

2.8.2 The involvement of AACO, IATA, and NavData Integrators in the MIDAD SG work can be leveraged for this.

2.9 Financial Plan

2.9.1 The purpose of the financing plan is to provide basic information as follows:

- (i) estimates of the element costs (labour, materials, equipment, etc.) of each distinct part of the overall project;
- (ii) the funds required to make disbursements at various stages in the project's progress;
- (iii) the currencies in which payments are to be made; and
- (iv) the sources from which the funds are to be forthcoming, whether from:
 - a. sources generated by the entity providing the MIDAD services from its operations, which would primarily include user charges, and possibly retained earnings, but could in some circumstances also include contractual payments; or
 - b. other sources, including information on the applicable conditions, i.e. interest rate, repayment period, etc.

2.9.2 Also to be emphasized is the importance of the availability of data showing the financial situation of the air navigation services provider over recent years, as well as anticipated developments over the period of debt repayment. Of particular relevance is the recording of revenues and expenses by major item. Estimates regarding future financial developments would emanate from budgets and longer-term financial plans. In the absence of such financial data, it would be much more difficult to decide whether or not the loan or financing sought should be granted and, if so, what terms should be offered.

2.10 Sources of Financing

2.10.1 A survey of potential sources of funds and which of them to approach should be done as early as possible in the planning process. Potential sources of funds will vary considerably from project to project and State to State. The sources to be approached should be studied and decided upon

individually for each project and could be grouped as follows: direct contributions from government(s); loans or debt financing; internally generated resources; equity financing; and leasing.

Direct Contributions from Governments

2.10.2 The extent to which direct contributions will be required from the government depends on a number of factors. Chief among these is the organizational form under which the MIDAD systems services will be provided, i.e. will the government be directly involved, either alone, or in a joint effort with other governments, or will it primarily involve a commercial corporation? Yet another factor is whether the traffic volume within the airspace concerned is sufficient to support the MIDAD systems component in financial terms, including servicing debt.

2.10.3 For most States, the foreign sources of financing are principally government operated. Such foreign financing may be available from foreign governments in the form of loans negotiated directly with the government of the recipient country or may otherwise be facilitated by particular agencies of government which have been established for the primary purpose of promoting the nation's export trade. Of particular importance among the possible sources of foreign financing available to developing States are the international banks and funds that have been established to assist in the financing and execution of projects promoting national economic development.

2.10.4 Project costs payable in foreign funds constitute a demand on the State's reserves of foreign exchange and as such their financing will usually have to be arranged through or with the approval of the appropriate government authorities. Nevertheless, foreign sources should always be explored as a matter of course, since financing may be available from them on more favourable terms than those obtainable from domestic institutions (e.g. lower interest rate, repayment over a longer period). However, there are also some risks involved in foreign exchange, such as currency fluctuations.

Debt Financing

2.10.5 The feasibility of debt financing will depend on whether the traffic to be served by the MIDAD systems to be financed is of sufficient volume and strength to service the debt, including interest and repayment of capital. Where an international agency or corporate entity would be providing basic AIS systems services, its costs of financing could be reduced if the States for which the basic services are being provided were to guarantee the servicing and repayment of the loans concerned. This in turn should reduce the costs to be recovered from these user States.

Internally Generated Resources

2.10.6 Depreciation and retained profits from the operation of air navigation services may become a supplementary source of financing for the MIDAD systems facilities. However, with regard to profits, an important qualification that needs to be recalled is the principle outlined in Doc 9082, paragraph 38:

“Air navigation services may produce sufficient revenues to exceed all direct and indirect operating costs and so provide for a reasonable return on assets (before tax and cost of capital) to contribute towards necessary capital improvements.”

Reference should also be made to the text on pre-funding of projects in 2.5.5 of the paper.

Equity Financing

2.10.7 Equity financing may be a viable alternative in some instances. For example, if the MIDAD systems services were acquired under contract from a commercial service provider, that operator could finance the investment required partially or completely through increased equity.

Leasing

2.10.8 Leasing rather than outright ownership could become an important alternative in the MIDAD systems and service provision. The possibility could also be explored of applying leasing to local units at MIDAD Centres, possibly through the establishment of leasing companies, which would operate in a manner similar to those purchasing and leasing out, for example, computer systems, communications systems and/or others under long-term leases.

3 ACTION BY THE MEETING

3.1 The MIDAD SG is invited to:

- a) note the content of this paper and take it into account when moving forward in advancing the financing of the MIDAD systems and services; and
- b) agree on the way forward for the development of the MIDAD Financial Model/Plan.

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