

Management of Aerodromes under the Local Ownership Plan

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SUMMARY Under the Federal Government's Aerodrome Local Ownership Plan, a number of aerodromes have been transferred to the respective local authorities who then own and manage their local aerodromes with some financial assistance from the Government. There are many differences between the management of aerodromes and the management of other Local Government facilities. The level of responsibility at an aerodrome is higher due to the safety requirements and the inherent complexity of aviation. The financial management of the aerodrome offers an entrepreneurial challenge. Engineering aspects, whilst containing elements that are familiar to local government engineers, include significant differences in the fields of safety standards, aircraft pavements, obstacle limitations surfaces, masterplanning, training, plant and equipment.

1 INTRODUCTION

Civil aerodromes in Western Australia aerodromes are owned by either the Federal Government, local authorities, or privately. The Federal Government policy is to move out of the business of owning and operating civil aerodromes and so their largest civil aerodromes, such as Perth and Jandakot, are soon to be transferred to the new Federal Airports Corporation. The Department of Aviation is negotiating to transfer their smaller aerodromes to the respective local authorities under the Aerodrome Local Ownership Plan. Under these circumstances, the management of aerodromes under the Aerodrome Local Ownership Plan is of real interest to Local Government engineers.

The Aerodrome Local Ownership Plan is designed to encourage local authorities to accept ownership and responsibility for their aerodrome. Under the Plan, the local authority operates the aerodrome and the Federal Government assists with the provision of capital and maintenance grants.

There are many differences between the management of aerodromes and the management of other local authority facilities. This paper first outlines the provisions of the Aerodrome Local Ownership Plan and the division of responsibilities between the local authority and the Department of Aviation as background to the situation. Later the management of the aerodrome is discussed in terms of the financial and engineering aspects and specific examples are given in the fields of safety standards, aircraft pavements, obstacle limitations surfaces, and masterplanning.

2 AERODROME LOCAL OWNERSHIP PLAN

The Aerodrome Local Ownership Plan (ALOP) was established in 1958 as a means of involving local authorities in their own aerodromes. Under the Plan the Federal Government transfers the ownership and responsibility for the smaller Government-owned civil aerodromes to the appropriate local authorities, who then operate the aerodrome with some financial assistance from the Federal Government.

There are essentially two classes of membership in the Plan:

- aerodromes owned by a local authority and served by scheduled air services; these are eligible for both development and maintenance grants;
- aerodromes owned by a local authority which are of benefit to civil aviation and which do not receive regular air services, and aerodromes owned by private organisations which receive scheduled air services; these are eligible for maintenance grants only.

The grants are paid by the Government on generally a dollar for dollar basis towards the cost of approved works. These works must be necessary for the basic function of the aerodrome, for the safety, regularity or efficiency of air services, for common user works, and must conform to an approved plan of development. The Department of Aviation has a well-established structure of funding procedures to examine, approve, budget and provide for these grants.

The advantage of ALOP to the local authority is that it gives Council control over the development of its own aerodrome. Since an aerodrome is often the gateway to a town or region and the impression generated by it is important, many local authorities wish the aerodrome to present a certain image. While the aerodrome is still Government-owned, the very limited funds available to Department of Aviation for government aerodromes are only sufficient to keep the aerodrome operationally safe, and the general facilities and amenities lag behind other aerodromes. Once locally owned, the local authority has the ability to develop the aerodrome to meet their aspirations and changing needs.

The advantage of ALOP to the Government is that the aerodrome costs them less to operate. The aerodrome is operated more efficiently using local authority resources, and the operating costs are partially offset by the passenger fees gathered by the local authority.

3 RESPONSIBILITIES OF AERODROME MANAGEMENT

The transfer of an aerodrome to a local authority

brings new responsibilities. There are obvious requirements to maintain the aerodrome in good condition, to meet the standards of the Department of Aviation through keeping the aerodrome licensed, to keep it open to the public, etc, which implies regular inspection and maintenance. In addition the local authority has the important responsibility for the safety and security of the aerodrome.

The safety responsibility demands the acceptance and enforcement of high operating standards in the engineering area. The magnitude of the responsibility is illustrated by the size of the public liability and catastrophe policy to cover Geraldton aerodrome, which has daily scheduled jet services. To cover a worst scenario of two Fokker F28 aircraft colliding, the policy is for \$40 million.

The security responsibility also is more demanding than usual local authority security requirements. The areas where aircraft operate - termed airside - must be isolated from the rest of the aerodrome to prevent people, animals or vehicles from colliding or interfering with aircraft, and regular fence inspections and maintenance are needed. Frequent runway inspections are also required; at Geraldton for example the runway is inspected twice daily.

The practical responsibility of the Department of Aviation in ALOP is limited to administration of the Plan, the regulatory aspects of standards and inspection, and the provision of air traffic control, flight service units, fire services, communications, T-VASIS, and navigational aids where required. At Geraldton aerodrome for example, the Department of Aviation operates a flight service unit, two navigational aids (NDB, DME), standby powerhouse, and satellite VHF link, and it inspects the aerodrome seven times a year.

4 AERODROME MANAGEMENT

The management of aerodromes has a number of important differences from the management of other local government facilities. Two facets are discussed here: financial and engineering.

4.1 Financial

The financial management of aerodromes is similar to that of roads in some ways: both may be jointly

funded between the local authority and the Government, there are Government engineering standards to meet, and the works have to fit into a Government programme. However roads, and most other local authority facilities, are not able to be operated as commercial propositions. Aerodromes have the potential to be self supporting through passenger charges and other revenue sources, and they represent an opportunity to exercise entrepreneurial skills within the framework of local government.

In maintaining and developing aerodromes, the local authority must provide half the cost of approved capital and maintenance works. The major proportion of the aerodrome operating income is derived from passenger landing fees which are applied to passengers on scheduled services. These fees are set by the local authority and are no longer subject to control by the Department of Aviation. Additional sources of income include:

- aircraft landing fees for non-scheduled flights;
- rents for hangars, terminal space, hire car facilities, refuelling sites;
- business concessions such as kiosks, rights to operate a hire car business at the aerodrome;
- advertising;
- cropping.

These additional sources of income can make up a significant proportion of total income, as is shown by the breakdown of revenue sources for Geraldton aerodrome in 1985/86 (Figure 1).

The routine maintenance costs (RM\$) - analogous to day-to-day operating costs - are generally in proportion to passenger numbers (PAX). A simple approximate relationship holds:

$$RM\$ = PAX + 2000$$

with a simple correlation coefficient of 0.84 and a standard error of estimate of 25250.

The relationship between passengers, revenue and costs is shown in Table 1 for aerodromes in Western Australia.

The smaller aerodromes with fewer passengers may have difficulty in being self-sufficient under ALOP and in those cases some local authorities have elected to operate at a loss or have obtained support from elsewhere.

Aerodrome	Passenger fee	Passengers	Routine maintenance	Maintenance/passenger
Albany	\$3.50	12871	15000	\$1.17
Bunbury	a	6262	5000	\$0.80
Esperance	\$4.00	17987	16000	\$0.89
Geraldton	\$2.60	41682	54000	\$1.30
Karratha	\$3.50	119002	115000	\$0.97
Kununurra	\$3.00	44549	68000	\$1.53
Laverton	\$0.60	2981	6000	\$2.01
Leonora	\$5.50	2508	9000	\$3.59
Newman	\$0	25758	34000	\$1.32
Paraburdoo	\$0	26555	20000	\$0.75
Port Hedland	\$3.00	90293	133000	\$1.47
Rottneest Island	b	66920	6000	\$0.09

Notes: Passenger fee is for full fare regular public transport passengers (RPT - typically Ansett WA). (a) charge per aircraft only, which is in the order of \$1.00 per passenger. (b) no specific aerodrome charge, although a general Island entry fee of \$2.00 is charged. Passengers are the total of RPT and supplementary airline licence (SAL - typically Skywest) in 1985. Routine maintenance is the Department of Aviation share for 1985/86 (the total routine maintenance cost was approximately twice the figure shown).

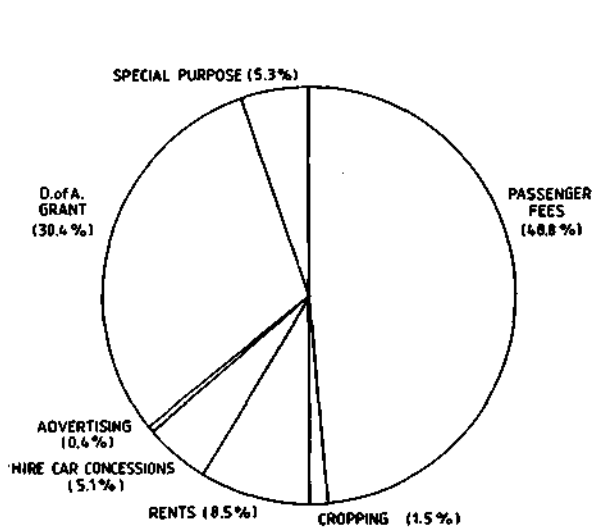


Figure 1 Revenue sources for Geraldton aerodrome

4.2 Engineering

The engineering elements of an aerodrome contain much that is familiar to the Local Government engineer: there are roads, carparks, water supplies, sewerage, buildings, and gardens. To illustrate the relative importance of each, a breakdown of average annual expenditure is given for a medium size aerodrome (Carnarvon) in Figure 2 and for a major aerodrome (Perth) in Figure 3.

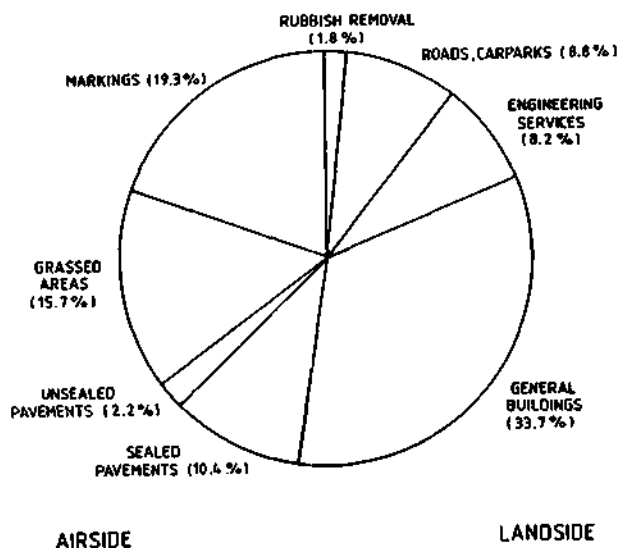


Figure 2 Average annual expenditure at a medium sized aerodrome (Carnarvon)

There are some significant differences in engineering as well: safety standards, aircraft pavements, obstacle limitation surfaces, masterplanning, and the dynamic nature of the industry. Nothing on an aerodrome is ever easier, simpler or less expensive in comparison to non-aerodrome works and several examples are given to illustrate this.

4.2.1 Safety standards

The safety standards which apply to an aerodrome are, not unexpectedly, higher and more comprehensive in nature than standards for other local government facilities. Almost any work on the areas used by

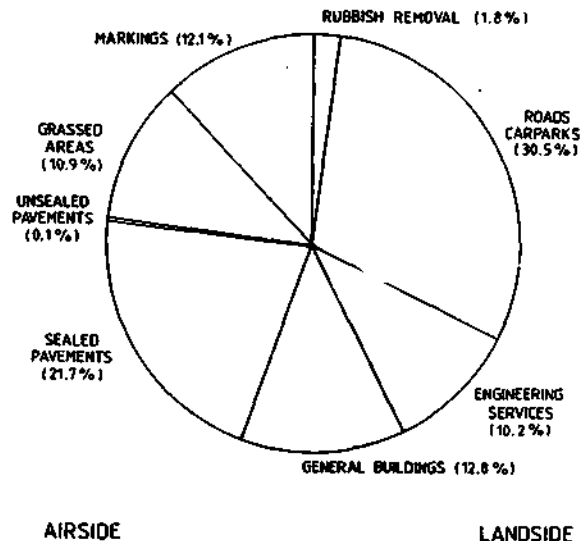


Figure 3 Average annual expenditure at a large aerodrome (Perth)

aircraft - movement area - is subject to strict control. If the work area takes longer than ten minutes to reinstate, a Method of Working Plan (MOWP) must be prepared. For the December 1986 reseal on the runway at Newman aerodrome, this was planned six weeks in advance with discussions between Mt Newman Mining as the aerodrome owner, Department of Aviation, and the airlines. The resultant MOWP was printed and distributed to 25 organisations or individuals prior to work commencing. Telexed warnings (NOTAMS) were sent to pilots out 48 hours before the works started. During the works, a fulltime safety officer was present to regulate the safety aspects of the work.

4.2.2 Aircraft pavements

The structural design of aircraft pavements such as runways and taxiways is quite different to roads due to different loadings, tyre pressures and frequencies. A Boeing 727 aircraft has a load of 21,500 kg per main tyre with a typical tyre pressure of 1100 kPa (Department of Housing and Construction, 1976), compared with a typical truck tyre load of 2050 kg at 550 kPa. The aircraft pavements are designed for 10000 coverages (US Corps of Engineers, 1977) factored for the undercarriage configuration of the critical aircraft, giving typically 30000 aircraft movements, compared with typically a million standard axles for roads. The design methods and philosophies are accordingly different.

The geometrical design is also different. In layout, aircraft pavements proportioned differently to roads. The main runway at Geraldton aerodrome is 1981 metres long and 45 metres wide and a single coat reseal costs in the order of \$135,000 per kilometre compared with \$12,000 per kilometre for roads.

The geometric standards are considerably more detailed and demanding for aerodromes to cope with the higher speeds and different vehicle dynamics; for example a Boeing 727 aircraft lands on a tricycle undercarriage at 220 kph. The Department of Aviation design regulations just for longitudinal and transverse slopes on runways run to fifteen paragraphs, with further paragraphs to cover gradients of runway strips, taxiways, aprons, flyovers, clearways, stopways, and runway end safety areas (Department of Aviation, 1982).

4.2.3 Obstacle limitations surfaces

Detailed and complex Department of Aviation regulations exist to provide obstacle free space for aircraft by controlling the location and height of any structure on or near an aerodrome (Department of Aviation, 1982). For example the terminal must be a minimum distance from the runway, the lighting towers for the aircraft parking area (apron) are limited in height, and boundary fences and power lines must be a minimum distance from a runway end. A significant part of the regular Department of Aviation inspections of licensed aerodromes involves checking that the obstacle limitations surfaces are not breached.

4.2.4 Masterplanning

The layout and development of an aerodrome should be in accordance with a masterplan to ensure that the various complex obstacle limitations surfaces and clearances are not breached and that the upgrading of the aerodrome is not restricted by previous developments. Masterplanning of aerodromes is a multidisciplinary and complex task starting with traffic forecasting and aircraft types and trends. In addition to obstacle limitations surfaces discussed above, there are minimum clearances between aircraft and other aircraft, buildings, fuelling installations, navigational aids etc (Strongman, 1980).

The width of the runway, and equally importantly the width of the runway strip within which the runway lies, dictates the offset of the aprons and the building area from the runway centreline. Considerable expense may be involved; a new main runway at Kalgoorlie aerodrome to provide for traffic growth to the year 2000 would need 80 hectares of land compared to 30 hectares for the present main runway, primarily to provide the required width (Airplan, 1985). At Christmas Island aerodrome, the present terminal and apron are too close to the runway to permit the development that would be desirable by the year 2000, and may have to be rebuilt elsewhere (Wallace, Emery and Associates, 1986).

4.2.5 Dynamic nature of aviation

The aviation industry is dynamic in comparison with road and rail transportation. The aircraft types change frequently due to changes in traffic and the short commercial life of aircraft. The Department of Aviation standards also change relatively frequently in response to changing needs.

Since aerodrome layout and geometric standards are closely related to aircraft type, planning must look far ahead to changing aircraft types and standards. For example, the main runway at Port Hedland aerodrome is 45 metres wide within a 300 metre wide runway strip. Although the runway bearing strength was only designed for the present needs of unrestricted Boeing 737 operations (115 passengers), the layout is geometrically suitable for the largest aircraft such as the Boeing 747 (400+ passengers). This will be suitable for any possible combination of changing standards or new aircraft, and upgrading the aerodrome to meet the town's future needs will be a straightforward matter of improving runway bearing capacity without the expense of relocating buildings, taxiways or aircraft parking areas.

4.2.6 Plant and equipment

Routine maintenance at aerodromes involves mowing, painting markers, sweeping and rolling pavements,

crack patching, cleaning, inspections and repairing fences. Although the usual Local Government plant and equipment is quite sufficient for this, the larger areas may justify larger machines; for example an aerodrome such as Kalgoorlie may have up to half a million square metres of grass to cut during the active growing season. There is a bonus though in that the added workload of the aerodrome would give a better utilisation of plant such as road brooms or rollers. Specialised equipment for aerodromes is limited to small items such as VHF radios to monitor aircraft arrivals and departures, paint machines for the frequent task of repainting the hundreds of square metres of markings, possibly a forage harvester to meet demanding cleanliness standards to ensure that grass clippings are not ingested by fanjet engines, and possibly yellow coloured vehicles with hazard lights for use on the aerodrome.

4.2.7 Training

The safety requirements and complexity of aerodromes make training an important matter for the local authority. The groundstaff and the nominated responsible officer - reporting officer - require specialised training to learn the methods of safe operation, the rules, regulations and jargon of aviation. Typically this training is provided by the Department of Aviation District Airport Inspector.

The local authority also has a responsibility to implement an Aerodrome Emergency Plan and work with the various organisations in their emergency roles at the aerodrome. Typically, full-scale exercises are held periodically. The most recent exercise at Jandakot involved a simulated midair collision between two light aircraft which involved the police, fire service, ambulance service, local hospital, State Emergency service, Department of Aviation, groundstaff, and aerodrome senior staff.

5 CONCLUSIONS

The management of aerodromes under the Aerodrome Local Ownership Plan involves a number of important differences from the management of other local government facilities. The local authority takes on a significant responsibility for the safe operation of the aerodrome. The financial management of an aerodrome has some similarities with the financial management of roads, but offers a chance for entrepreneurship in local government. The engineering management is more demanding and complex than other local authority facilities. The principal differences are in complexity, higher safety standards, aircraft pavements, obstacle limitations surfaces, masterplanning, the dynamic nature of aviation, plant and training.

6 ACKNOWLEDGEMENTS

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