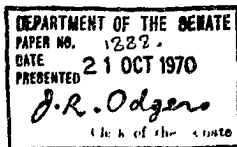


1970



THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REPORT

relating to the proposed development of

AVALON AIRPORT (VICTORIA)

to

BOEING 747/CONCORDE STANDARD

(TWENTIETH REPORT OF 1970)

COMMONWEALTH GOVERNMENT PRINTING OFFICE
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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

DEVELOPMENT OF AVALON AIRPORT (VICTORIA)
TO BOEING 747/CONCORDE STANDARD

R E P O R T

By resolution on 3 September 1970 the Senate referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament the proposal to develop Avalon Airport in Victoria to Boeing 747/Concorde standard.

The Committee have the honour to report as follows:

THE REFERENCE

1. The works referred to the Committee involve
 - strengthening the existing runway and part of the taxiway connecting the northern end of the runway with service areas;
 - extending the runway by 1,000 ft at its southern end;
 - developing a taxiway parallel to the runway for its full length and providing an aircraft apron;
 - providing over-runs and blast areas at either end of the extended runway; and
 - constructing an access road and car park.
2. The total estimated cost of the work referred to the Committee is \$6.4 million.

2.

3. The purpose of the work is to provide facilities and pavements for the training of air crew flying Boeing 707 and Concorde aircraft weighing up to 250,000 lbs and Boeing 747s weighing 600,000 lbs.

THE COMMITTEE'S INVESTIGATION

4. The Committee received written submissions and drawings from the Departments of Civil Aviation and Works and Qantas Airways Ltd. Evidence was taken from their representatives at public hearings in Canberra and at Avalon. We also heard evidence from the Chairman of the House of Representatives Select Committee on Aircraft Noise, a Member of the House of Representatives, representatives of the Geelong Church of England Grammar School and the Shire of Corio, a local resident and from the State Member for Gisborne in the Victorian Parliament.

5. We inspected the Avalon facilities from the air and on the ground and observed jet aircraft during training circuits.

EXISTING FACILITIES

6. The airport at Avalon is a 4,500 acre Department of Supply aerodrome, 34 miles from Melbourne and 9 miles from Geelong. It was brought into service in 1953 and until 1958 it provided only for the test flying of military aircraft such as the Lincoln, Sabre and Canberra. Although these activities demanded a wide range of costly facilities and services, the movement rate at the airport was low. It was subsequently used by the United States Air Force Weather Reconnaissance Squadron, the R.A.A.F. Research and Development Unit, R.A.N. and visiting V.I.P. aircraft.

7. In 1958, when Qantas acquired Boeing 707 aircraft, the Department of Civil Aviation provided funds for upgrading Avalon for civil jet training

purposes. The work included lengthening the runway from 7,000 ft to 9,000 ft, providing 25 ft wide sealed shoulders on either side of the 150 ft wide runway, two aircraft turning loops along the runway and a concrete/flexible apron near the northern end of the runway. The work was done to the same standard as the original construction and facilitated training in smaller Boeing 707/138C jets.

8. With these facilities the aircraft movement area can cope with the Qantas training demand of 12 landings and 12 take-offs of the larger Boeing 707/338C each hour for 12 hours on each of six days a week. Some 90% of all aircraft movements at Avalon are by civilian aircraft, most of them being Qantas jets used for training.

9. Other operational facilities and services include

- an instrument landing system with approach lighting for landings to the south;
- a manned control tower and airport fire and rescue unit;
- Qantas buildings and facilities.

10. The current Qantas training periods are 6.15 a.m. to 10.15 a.m., 11.15 a.m. to 3.15 p.m. and 4.15 p.m. to 8.15 p.m. each day except Sunday.

11. The Committee noted that variations in these training periods are not expected in the foreseeable future.

COMMERCIAL AIRLINE TRAINING

12. The present training arrangements include

- domestic training, with the exception of pure jets, at Mangalore (which is also used as an alternate airport), at Bacchus Marsh (which is also used by general aviation

and gliding) and Tamworth (which is also used by regular public transport aircraft and general aviation);

- international and limited domestic jet training at Avalon; and
- most domestic jet training at Melbourne Airport at Tullamarine.

13. We noted that when Melbourne Airport commences to take regular domestic airline traffic from mid-1971, it is proposed to transfer most training in domestic jets to Avalon.

14. The Committee were informed that, ideally, all airline training should be carried out at an airport specifically assigned for training purposes only and remotely removed from centres of population. It is an activity which is not compatible with other than limited regular public transport and general aviation activity and it undoubtedly presents a noise problem by day as well as by night. This problem arises partly because of the high movement rate and partly because of emergency flight training sequences. Information given in evidence suggested that to provide such a facility, ab initio, would cost more than \$15 million.

15. It was submitted that, as an alternative to this ideal, it is operationally acceptable for jet training purposes to continue to use the facilities at Avalon for training in the current aircraft types because this development represents a less costly investment. We understand that this alternative is acceptable to the airlines.

16. Future Training Requirements Apart from the Boeing 707/338C now in use, the Qantas fleet is expected to be supplemented by Boeing 747/238B

aircraft in 1971 and possibly by the Concorde in 1974/75. Based on the need for training pilots in those aircraft, we noted that the Qantas training requirements for the next ten years will necessitate

- two aircraft in the training circuit concurrently under normal training conditions;
 - three aircraft in the training circuit concurrently under peak training conditions;
 - up to 15 aircraft landings per hour comprising various combinations of full-stop landings and touch and go operations.
- On the basis of one in every four landings being full stop, this would be equivalent to 32 movements per hour.

17. Until about 1975, the Melbourne based domestic power jet fleets of T.A.A. and Ansett Airlines of Australia will consist of Boeing 727s and D.C.9s together with the prospect of a version of the air bus. Training in these aircraft is expected to produce a requirement for 1,000 to 1,250 movements per month with peaks at the introduction of new aircraft types or new units to present fleets. We noted that aircraft availability is a major influence on domestic aircraft training programmes and that training tends to occur spasmodically.

18. The capacity of the present facilities at Avalon is 25 movements per hour and it was explained to the Committee that this performance could be boosted to 38 movements per hour with the provision of a parallel taxiway with adequate runway entry/exits. The submission to the Committee then is, to permit Avalon to cope with Qantas and domestic jet training loads, its capacity should be boosted to allow maximum use of the existing

runway. Except for the length of the runway which is discussed later, the capacity of the facility would then be sufficient to accommodate Qantas and most domestic jet training for about the next five years.

THE NEED FOR THE PROPOSED WORK

19. Accepting that Avalon is to function for at least the next five years for Qantas and most domestic jet training purposes, the need for the proposed work falls into the following main categories.

20. Runway Lengthening In order to maximise the use for training purposes of an aircraft which must be diverted from commercial operations for that purpose, as many landings and take-offs as possible are practised. This involves the use of the touch and go technique in which an aircraft is landed normally and allowed to decelerate well below take-off safety speed. Thrust is then re-applied and the aircraft accelerates and takes off. The pilot is thus able to obtain useful landing and take-off experience without recourse to the heavy application of wheel brakes normally required in taxiing and landing. A full-stop landing, not only takes longer to carry out but the time required for the wheel brakes to cool between full-stop landings makes it impracticable for regular use in day to day training.

21. Whilst the present runway is long enough for domestic jet and Boeing 707 training it has been calculated that for touch and go training procedures, the much heavier Boeing 747 will require a runway up to 10,000 ft long.

22. Pavement Strengthening As explained in paragraph 30 below the use of Avalon has been restricted owing to the state of repair of the runway. The present reference is basically concerned with not only permitting Boeing 747 training to occur at Avalon but also increasing its capacity to cope with a greater training load. The present work, therefore,

includes not only the strengthening of the runway so that it can be used by the heavier Boeing 747 aircraft but also to enable it to be used without operational restriction.

23. Parallel Taxiway The movement capacity of the runway is generally governed by the length of time an aircraft occupies the runway. Thus a pavement system which requires an aircraft to use the runway to taxi to the apron or to the point of take off roll has less capacity than one where an aircraft uses a taxiway for access purposes.

24. As already explained, the capacity of the runway at Avalon can be improved from 25 to 38 movements per hour by the provision of a parallel taxiway. This additional capacity is required, in effect, so that domestic jet training can be transferred to Avalon in mid-1971.

25. Aircraft Apron The present apron can accommodate two Boeing 707/138C aircraft but the clearances from the adjoining taxiway are insufficient for a Boeing 747 to manoeuvre without major alteration and extension to the apron.

26. A much larger apron is now required to enable two aircraft of Boeing 747 or Concorde size to be parked at the one time, with planned provision for subsequent extension. It is therefore proposed to build a new apron for this purpose and to use the existing apron for domestic aircraft up to the size of a Boeing 727.

27. Committee's Conclusion The Committee concluded that there is a need for the improvement of the facilities at Avalon Airport as proposed in this reference.

THE PROPOSED WORK

28. Existing Conditions The original runway and taxiway were constructed as sealed flexible pavements designed for a maximum single wheel load of 40,000 lbs and consisted of 6 in. of fine crushed rock on 20 in. of granite sand. From an assessment of the pavements made about 1958, it was concluded that they could satisfactorily accept Boeing 707 training operations and other traffic, although it was expected that a higher level of maintenance than normal would be required.

29. During initial training operations by Boeings weighing up to 200,000 lbs, the runway suffered some damage and repairs were carried out in 1959. It has since performed satisfactorily although some loss of shape has occurred and this has been corrected by periodic resurfacing with bituminous concrete.

30. With the introduction of the slightly heavier Boeing 707/338C and Boeing 727 aircraft in 1965, some restrictions were imposed on operating weights and the frequency of heavy aircraft, to avoid unnecessarily over-loading the pavement. Restrictions on Boeing 707s now involve a weight limitation of 240,000 lbs and training is limited to six days a week, 12 hours per day with no more than 12 landings and 12 take-offs an hour. Under these conditions, it has been possible for Boeing aircraft to train at Avalon continuously without significant pavement problems.

31. Runway Strengthening and Lengthening The strengthening work proposed will involve increasing the thickness of the southern 8,500 ft of the existing runway with 8 in. to 9 in. of bituminous concrete in successive layers 2 in. thick. This work is to be carried out at night to permit normal training operations to continue during the day.

32. Concurrently, the northern 500 ft of the runway and 1,300 ft of the existing access taxiway are to be reconstructed in cement concrete 14 in. thick following the removal of part of the existing pavement and stabilising the top 6 in. of the granite sand with cement.

33. The extension of the runway by 1,000 ft to the south is to consist of 14 in. of cement concrete on a 12 in. base of granite sand, the top 6 in. of which will be stabilised with cement. To conform with normal pavement widths, the extension is to have paved shoulders 25 ft wide which will be surfaced with 1 in. of bituminous concrete.

34. Associated works include the construction of bitumen sealed blast areas 200 ft by 200 ft at both ends of the extended runway and the replacement of an 800 ft bitumen sealed over-run pavement beyond the new blast area at the southern end. These pavements will be strong enough for emergency use by aircraft and suitable as a base for further extension of concrete runway pavement is necessary in the future. The 25 ft wide shoulders along both sides of the present runway are to be reinstated with bituminous concrete.

35. The arrestor barrier equipment now at the ends of the runway are to be appropriately relocated. Throughout the construction period at least one of these units will be available for use when R.A.A.F. aircraft use the runway.

36. New Taxiway and Apron As with the runway extension, the new parallel and connecting taxiways and the new aircraft parking apron are to be constructed in 14 in. thick cement concrete on a 12 in. base of granite sand. The taxiways are to be 75 ft wide with 10 ft wide shoulders surfaced with 1 in. of bituminous concrete. The parking apron is to be 575 ft long and 270 ft wide.

37. Other Engineering Services Associated work includes earthworks, grassing, drainage, ducts and apron floodlighting. A bitumen sealed access road and car park, which is also part of the reference, is to be provided to serve the aircraft parking apron. Provision is being made in the apron design for the installation by the fueling contractor of a hydrant refueling system.

38. Committee's Recommendation The Committee recommend the construction of the work in this reference.

PROGRAMME

39. The objectives of the construction programme submitted to the Committee are for the runway work and part of the taxiway to be completed before delivery of the Boeing 747 aircraft in August 1971 and for maximum possible length of the runway to be available during daylight hours for training purposes during construction. To this end, as much work as possible on the runway extension and strengthening is scheduled for night hours and during the Christmas/New Year close down period of 1970/71.

40. During the application of the initial and final bituminous concrete overlays, earthworks associated with the instrument landing system are to be carried out and it will be necessary for the runway to be closed. During that period Qantas training will be conducted at Tullamarine, Department of Supply flight testing will be rearranged and special provision made as required for R.A.A.F. operations.

41. The target date for the runway work is May 1971, for completion of the northern and southern loops of the taxiway system and the apron, September 1971, and for the remainder of the work, the end of 1971.

We noted that during the period between May 1971 and the time the northern and southern taxiway loops are completed, Boeing 707 and 747 aircraft will be required to execute 180° turns at the ends of the runway.

42. The completion targets are based on the first part of the work being commenced in November 1970 and do not allow for time lost during construction because of prolonged periods of wet weather or industrial difficulties.

ESTIMATE OF COST

43. The estimated cost of the work when referred to the Committee was \$6.4 million, as follows:

	\$
Strengthening existing runway and taxiway	2,740,000
Runway extension	850,000
Taxiway development	2,380,000
Aircraft apron	430,000
	6,400,000

OTHER OBSERVATIONS

44. Aircraft Noise The runway at Avalon is oriented generally north and south. The city of Geelong is about nine miles to the west. The air approach to the southern end of the runway is over Corio Bay while the northern approach is over an essentially rural area. Aircraft in circuit around the airport, however, fly over Little River Township to the north-east of the airport and Lara which is due west. The Geelong Church of England Grammar School situated on Corio Bay is almost under the western circuit and south of Lara.

45. The occurrence of noise in the vicinity of an airport used for training purposes differs from that encountered where the airport is being used for regular public transport. Not only is there an aircraft in the area being used for training purposes fairly constantly which produces an extremely high movement rate, but pilots are undergoing emergency flight training sequences, sometimes flying with a reduced number of engines operating which is not conducive to noise mitigation. The other factor which accentuates the noise problem at Avalon is that most aircraft taking off turn into a left or right hand circuit but do not climb above 1,500 ft. They remain at this height with power reduced until the circuit is completed and the approach phase is commenced.

46. The Committee carried out a ground inspection at Lara and at the Geelong Grammar School while aircraft were doing circuit training. Whilst the noise nuisance was not intolerable in these instances, we could understand that on occasions it might be distressing and the apprehension expressed by witnesses about the usage rate of Avalon being increased. In this connection, it seems inevitable that when domestic jet training is transferred to Avalon and Boeing 747 training commences, while the level of noise of individual aircraft will not necessarily increase, the constancy of it most certainly will.

47. Quite clearly, under the present civil aviation policy, the Commonwealth has a responsibility to provide landing facilities for commercial pilot training and, because of the time factor, it is obvious that the upgrading of the facilities at Avalon is the only practicable way of satisfactorily providing for Boeing 747 training. We therefore believe that the work in this reference should be carried out without further unnecessary delay.

48. We do, however, strongly recommend that the Government take immediate steps to plan elsewhere a facility for commercial jet pilot training. The aircraft noise problems associated with jet aircraft being used for training purposes pose special problems and call for special treatment. We do not consider, for example, that people living in places such as Lara and Little River should be subjected to low flying noisy aircraft which will use the Avalon Airport up to 38. times per hour from 6.15 a.m. to 8.15 p.m. and sometimes later.

49. Furthermore, it is our view that the future training airport should not be located in proximity to even small centres of population and schools but should be remotely situated. In planning the facility, steps should therefore be taken which will make it impossible for the public to encroach on the area.

50. It follows from our conclusions that we consider that after the presently proposed development of Avalon occurs, it should not be further upgraded and the possible construction of an east-west runway should not be contemplated. It is also our view that the Department of Civil Aviation, in collaboration with the airlines, should re-examine the flight paths and training practices at Avalon and introduce navigational aids to ensure that maximum protection from aircraft noise is afforded for those who live in the vicinity of the airport and under the flight paths regularly used during training exercises.

51. Programme We feel it is necessary to point out that the Committee received the reference at a point in time which made it difficult, if not impossible, not to endorse the work. Not to do so would mean that

the training of Qantas air crew on Boeing 747 aircraft could only be done under considerable penalties after their delivery in August 1971. The Committee feel that, because of the programme, it was left with no alternative but to recommend the construction of the proposed work at Avalon.

52. It is quite probable that, if the programme had not been so demanding the Committee would have recommended the development of a training airfield in another location. As the Department of Civil Aviation has known of the Qantas Boeing 747 programme since 1968, we feel it is necessary to protest yet again at the apparent inability of the Department to do its forward planning effectively and at its apparent indifference to the requirements and possible implications of a Committee investigation.

RECOMMENDATIONS AND CONCLUSIONS

53. The summary of recommendations and conclusions of the Committee is set out below. Alongside each is shown the paragraph in the report to which it refers.

Paragraph

- | | | |
|----|---|----|
| 1. | THERE IS A NEED FOR THE IMPROVEMENT OF FACILITIES
AT AVALON AIRPORT AS PROPOSED IN THIS REFERENCE. | 27 |
| 2. | THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE
WORK IN THIS REFERENCE. | 38 |
| 3. | THE ESTIMATED COST OF THE WORK WHEN REFERRED TO
THE COMMITTEE WAS \$6.4 MILLION. | 43 |
| 4. | THE WORK IN THIS REFERENCE SHOULD BE CARRIED OUT
WITHOUT FURTHER UNNECESSARY DELAY. | 47 |

Paragraph

- | | | |
|----|---|----|
| 5. | IMMEDIATE STEPS SHOULD BE TAKEN TO PLAN ELSEWHERE A TRAINING FACILITY FOR COMMERCIAL JET PILOT TRAINING. | 48 |
| 6. | THE TRAINING AIRPORT SHOULD NOT BE LOCATED IN PROXIMITY TO EVEN SMALL CENTRES OF POPULATION AND SCHOOLS BUT SHOULD BE REMOTELY SITUATED. | 49 |
| 7. | THE POSSIBLE CONSTRUCTION OF AN EAST-WEST RUNWAY AT AVALON SHOULD NOT BE CONTEMPLATED. | 50 |
| 8. | THE FLIGHT PATHS AND TRAINING PRACTICES AT AVALON SHOULD BE RE-EXAMINED AND NAVIGATIONAL AIDS INTRODUCED TO ENSURE THAT MAXIMUM PROTECTION FROM AIRCRAFT NOISE IS AFFORDED THOSE WHO LIVE IN THE VICINITY OF THE AIRPORT. | 50 |
| 9. | IT IS NECESSARY TO PROTEST YET AGAIN AT THE APPARENT INABILITY OF THE DEPARTMENT OF CIVIL AVIATION TO DO ITS FORWARD PLANNING EFFECTIVELY. | 52 |



(C.R. KELLY)
Chairman

Parliamentary Standing Committee on Public Works,
Parliament House,
CANBERRA, A.C.T.

19 October 1970.