1973

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

Parliamentary Standing Committee on Public Works

REPORT

relating to the proposal to construct

WELLINGTON TELEPHONE EXCHANGE

at

Perth, Western Australia

(FIRST REPORT OF 1973)

FOR SENATOR JESSOP

In accordance with the provisions of the Public Works Committee Act 1969-1972, I present the report relating to the following proposed work:

WELLINGTON TELEPHONE EXCHANGE AT

PERTH, WESTERN AUSTRALIA.

10 May 1973.

C O N T E N T S

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

WELLINGTON TELEPHONE EXCHANGE
PERTH, W.A.

REPORT

By resolution on 15 March 1973, the Senate referred to the Parliamentary Standing Committee on Public Works for investigation and report the proposal to erect a telephone exchange building at Wellington Street, Perth, Western Australia.

The Committee have the honour to report as follows:

THE REFERENCE

1. The proposal referred to the Committee is for the erection of a high rise building comprising a ground floor and 16 upper floors, on a site on the corner of Shafto Lane and Wellington Street, Perth. Its rear boundary abuts the existing Central Exchange.

2. The proposed building has been designed to accommodate a wide range of trunk switching and associated telecommunications equipment, which when installed will meet most major service requirements of Perth until about the turn of the century.

3. The estimated cost of the proposed work is $11.3 million.

THE COMMITTEE'S INVESTIGATION

4. The Committee received written submissions and drawings from the Australian Post Office and the Department of Works and took evidence from their representatives at public hearings on 17 and 18 April 1973. We also received written submissions and took evidence from representatives of the West Australian Chapter of the Royal Australian Institute of Architects and the Professional Officers' Association of the Commonwealth Public Service. Prior to the hearing the Committee inspected facilities in the General Post Office, the existing Pier and Central exchanges and the site of the proposed building.

5. The Committee's proceedings will be printed as Minutes of Evidence.

PERTH TELECOMMUNICATIONS FACILITIES

6. Perth is the main trunk switching centre for the Western Australian network and functions are shared between the Central Exchange, Pier Exchange, and the General Post Office, which are all situated in the inner city area. Surrounding this zone to a radius of 20 miles is a region of suburban and outer suburban exchange areas, and further out to several hundred miles are a number of secondary trunk switching centres. The balance of the State is serviced by minor switching centres dependant on the main trunk switching centre in Perth.

7. The specific telecommunications facilities affected by this proposal are described in the following paragraphs.

8. Central Exchange This is a two-storey brick building erected in 1914 and located in Murray Street adjacent to the site of the proposed new exchange. It accommodates 11,800 lines of switching equipment of obsolete quality. The building also accommodates associated offices,

staff amenities and anciliary plant. A lack of space and the nature of the existing structure place limitations on the installation of additional equipment and its capacity is expected to be reached in 1974.

9. Pier Exchange This building located in Pier Street is a multi-storey structure, stage 1 of which was completed in 1965 and stage 2 in 1970. The facility accommodates 12,000 terminations of automatic trunk and tandem equipment, 15,000 terminations of long line equipment, 2,400 terminations of subscriber local tandem equipment and equipment serving the Pier Local subscriber areas. Space is reserved for additional local subscriber switching apparatus to cater for normal growth in the Pier area and also for expansion in the Central Exchange area beyond 1974. The Perth terminal of the common user data network (CUDN) is presently being installed in this building.

10. Bulwer Exchange This facility is located 1.3 kilometres north of the proposed Wellington site. It is a single storey building currently accommodating 8,000 lines of local switching equipment. One thousand lines of this equipment presently provides service for the Central exchange area subscribers. The total capacity is 9,000 lines and is expected to be fully absorbed by 1977/78.

11. General Post Office This is a multi-storey building located in Forest Place approximately 4 blocks east of the proposed Wellington Exchange. It accommodates postal administrative and engineering services together with manual assistance and telex facilities. Most of the telecommunications equipment is old and obsolete. Lack of space and the structural nature of the building limit expansion for further equipment installation.

FUTURE CONSIDERATIONS

12. The Committee were told that there has been a substantial general growth in telecommunications traffic and associated services activity in recent years, and indications are that this trend will continue. The Post Office's long term plan to meet this general growth is based on the establishment of two main trunk switching centres in Perth and is regarded by the Post Office as being the most economical solution to meet projected service demands until about the end of this century. Under this plan, the centres would be the key facilities of the Western Australian sector of the national trunk network and would perform the following main functions:

- the interconnection of subscriber services through automatic switching equipment in accordance with established transmission standards and with equipment that must suitably process telecommunications to any part of the national network;
- telegraph switching, which necessitates similar types of equipment, telex and data services;
- provision of transmission facilities for telephone, telegraph, broadcasting and television traffic.

13. The first of the two major centres, Pier Exchange, was established as a major trunk switching centre in 1969 and has been required to cope with increasing traffic demand assisted by the facilities available in the Central and Bulwer exchanges and the General Post Office.

NEED FOR NEW AND ADDITIONAL FACILITIES

14. Trunk Traffic National and intrastate trunk traffic switched through Perth has increased at the rate of 19% over the past 8 years.

On present predictions the existing capacity for 12,000 trunk terminals in the Pier Exchange will be fully utilised by 1978. By the year 2000, the requirement is expected to be of the order of 134,000 terminals. Under the Post Office's long term plan, it is expected that this demand can be met by the proposed Wellington Exchange until about 1990. Later a further facility will be required and will probably be located adjacent to and as an extension of the Pier Exchange.

15. Based on the volume of international trunk traffic with the Commonwealth average showing an increase at the rate of 30% per annum, additional accommodation for this facility is required now and further accommodation needed to be planned in 1982.

16. Manual Assistance Services Effective operation of the manual assistance centre in the General Post Office is hampered by the shortcomings of the existing equipment which is of an early design and cannot fully utilise the modern facilities available from automatic switching equipment now in general use. Assuming maximum use of the subscriber trunk dialing (STD) facility, there will be a continuing demand for manual assistance by those who do not wish to use STD and also for directory assistance, service difficulties and faults, interception, appointment and reminder calls.

17. Telex Services Growth in demand for this facility is increasing at a rate in excess of 30% per annum. The telex switching equipment is housed in the G.P.O. and is considered to be totally inadequate. It has already become necessary to adopt costly and unsatisfactory expedients to cope with service demands.

18. Common User Data Network Pier Exchange is currently being installed with Common User Data Network (CUDN) equipment which has a normal economic life of 10 years. It will not be possible to accommodate new equipment and to meet the forecast growth at the rate of over 20% per annum in the Pier building owing to floor loading limitations.

19. Subscribers' Local Exchange The capacity of the local Central Exchange is expected to be reached in 1974 and it will be necessary to adopt expedients to meet the demand for new services until a new facility can be provided. The subscribers within the area have mainly commercial and business interests and average a high calling rate per line. By 1976, the demand is expected to reach 10,690 and by 2000, 37,000. The Central Exchange cannot be adapted to meet this demand and its obsolete equipment is unable to provide the full range of facilities available with modern equipment. When new equipment is brought into service in the proposed Wellington Exchange, it will meet development and progressively replace the existing Central Exchange equipment.

20. Computer Facilities The Post Office requires computing facilities for many applications including preparation of salaries, maintenance of records, telephone accounting and engineering functions. The Post Office does not have computing facilities in Western Australia and has limited access only to the installation in the University of Western Australia. This arrangement will become less satisfactory as the telecommunications networks expand.

21. Conclusion Whilst the capacities of the existing exchanges are quickly being reached, the buildings, except the Pier Exchange, cannot be effectively extended or adapted to accommodate additional and modern

equipment. The problem is accentuated by the necessity to operate with a large quantity of old equipment which is incapable of providing the full range of facilities as available from modern equipment provided in the Eastern States. The cost to maintain the old equipment is very high and it is not possible to replace this equipment before an additional facility is operating in substitution.

22. There is therefore a need to provide additional facilities in view of the capacities of the existing exchanges being reached in 2 to 4 years. It was clear that the new facilities should provide for maximum replacement of the obsolete equipment, as well as providing the additional requirement for growth demands. Assuming that the Post Office's long term plan for the Western Australian telecommunications network is economically based on there being two main exchanges in Perth, then the Committee agree that the additional facilities should be provided in the proposed Wellington Exchange.

THE PROPOSAL

23. The new exchange building will accommodate the following functions:

24. Manual Assistance Centre Two hundred trunk assistance positions are to be provided. It is planned that 100 positions will be in operation in 1978 and for full capacity to be reached in 1988.

25. Tandem Exchange Where calls cannot be directly switched from origin to destination at one exchange, the call is transit switched through connected tandem exchanges and thus actioned jointly and instantly by the two exchanges. There is no space to extend the present installation in the Pier Exchange and an additional tandem switching centre is to be located at Wellington with an ultimate capacity of 10,000 terminations.

26. Automatic Trunk Exchange Pier, together with the proposed Wellington Exchange, will form an integral part of the national trunk network switching for all interstate and the majority of intrastate trunk traffic originating and terminating in Western Australia. The proposed capacity of Wellington will be 64,000 terminations.

27. Long Line Equipment This is a necessary component of the main trunk switching centre and in this case, it is estimated that 80,000 channel terminations of long line terminating and amplifying equipment are necessary to serve trunk and local circuits for the year 2,000.

28. International Trunk Exchange Accommodation for equipment to satisfy the projected demands for international trunk services will be provided to supplement facilities in the existing Pier Exchange.

29. Subscribers' Local Exchange This network will cover all the present Central Exchange area and part of the adjoining Bulwer Exchange area. The provision of this facility in the Wellington Exchange will defer the necessity to extend the Bulwer Exchange for some 10 years.

30. Automatic Telex Equipment This facility will be progressively transferred from the G.P.O. building where it is presently occupying space designed for other purposes. Provision will be made for future growth.

31. Automatic Data Switching Overseas trends indicate that there is an increasing demand for data switching services. There is no installation for this service in Western Australia now and space will be provided in this proposal to meet the development of these services which are similar to but operate on a higher transmission speed than telex services.

32. Common User Data Network (CUDN) Provision is being made to locate the next generation equipment in this proposed exchange as it will not be possible to extend the service now being installed in the Pier Exchange.

33. Post Office Administration and Engineering Computer It is proposed to house a computer in the Wellington building to provide facilities for the Post Office to prepare salaries, maintain telecommunications circuit records, telephone accounting and other engineering functions.

34. Proposed Location It is proposed to locate the new exchange adjacent to the existing Central Exchange building. This would place it on the existing city cable network which has been developed to serve the present main exchanges, Pier and Central. The site is fully serviced and is accessible through all forms of public transport. We were told that the construction of the new exchange in this area is acceptable to the responsible local authorities.

35. Committee's Conclusion The Committee agree that the functions proposed by the Australian Post Office for the new Wellington Exchange to meet the long term needs of the expanding Western Australian telecommunications network are appropriate.

36. The Committee also agree that the proposed exchange should be located adjacent to the existing Central Exchange building.

THE PROPOSED BUILDING

37. Site The site is a rectangular block with a frontage of 43.40 metres to Wellington Street and sloping up some 3 metres over 123 metres along Shafto Lane which forms the eastern boundary and covers an area of 2,676 sq. metres. The property is owned by the Commonwealth.

An adjoining property "Raphaels", an area of 806 sq. metres, and Shafto Lane, an area of 518 sq. metres, are being acquired for cable access, to facilitate construction and for future development. In the interim, the property acquired from "Raphaels" will be used for car parking purposes and also for the installation of underground fuel tanks. The proposed building will occupy most of the Commonwealth-owned land.

38. Parking for 20 cars will be provided on the area unoccupied by the building including the properties currently being acquired. Loading and unloading facilities will be provided within the site.

39. General Planning The proposed exchange will rise to approximately 103 metres and visually dominate the surrounding buildings which are comparatively low in height. These include retail shops, some offices, warehouses and minor industrial establishments. The height dominance could decrease in the future as current zoning regulations allow the building of hotels, office blocks and cultural activity centres.

40. The building mass is set back some 15 metres from Wellington Street but the podium of three floors extends to the boundary. This podium will feature an outdoor terrace on the third floor roof for staff recreation use. The first and second floors also have some plantation beds facing the street. The approximately square section tower is a virtually windowless structure but the design has provided projections and continuous grill openings for visual contrast of the external wall surface. The walls will be off form concrete covered with acrylic based anti-glare colour surfacing. The building is to be capped by an upswept plant room roof which will also support the boiler flues and exhausts.

41. The lower floors contain the heavily staffed areas, the ground floor being the main staff amenities and recreation area. This helps reduce staff movement to equipment floors and facilitates internal security

of expensive equipment. The main service core is in the north-west corner containing lifts, ducts, fire stairs and toilets. A second fire stair and ducts are located in the south-east corner.

42. Air handling plant rooms are located generally on the floors they serve. Refrigeration plant and emergency power plant are located on the fifteenth and sixteenth floors.

43. It is proposed that the building will be occupied in the following manner:

44. Ground Floor Dining and recreation facilities for staff employed in the building will occupy the greater proportion of this floor. A cable chamber extending vertically to the first floor level will be located on the southern side. Equipment, unpacking and storage areas are provided adjacent to the service lane. A security guard office is located at the main building entrance for maintaining surveillance over the main entry point and foyer area. The remaining space has been allocated for the Electricity Supply Authority switchroom, library, training, staff interviews, fire control, building management, stores and the air conditioning plant.

45. Upper Floors Floors 1 to 13 inclusive will accommodate the various forms of telecommunications equipment proposed together with associated power rooms, air conditioning plant, supervisory and training offices and staff amenities. The telecommunications facilities will include international, national and telex manual assistance centres, subscribers' local and tandem switching equipment, automatic telex switching equipment, automatic trunk switching equipment, data switching equipment and common user data network equipment.

46. Fourteenth Floor This floor will house the Australian Post Office administration computer, office space for engineering and administrative staff and a library. A receipt/despatch area, data preparation area, programmers area, air conditioning plant, amenities and stores area will also be provided on this floor.

47. Fifteenth and Sixteenth Floors These floors have been allocated to building engineering services including power, air conditioning and passenger lift motor equipment. Maintenance control for these services will be actioned from the fifteenth floor.

48. Roof Part of the roof area will be occupied by the goods lift motor room, tank room and cooling towers.

49. Amenities It was noted that amenities and facilities to be provided will conform with the relevant ordinances, the amenities code and the normal Post Office standards. The cafeteria will provide hot meals and light refreshments with seating for 216 persons. The total staff in the establishment will be 910 persons of whom a maximum of 520 would be on duty simultaneously.

50. Structure Due to unsuitable topsoil foundation material, the building will be founded on reinforced concrete piles bored to siltstone at a depth of 30 metres. The building will be constructed of reinforced concrete utilising load bearing external walls. Thus perimeter columns are not required. The external walls are designed to withstand earthquake loads for Seismic Zone 1 of the American Uniform Building Code, and they also contribute to the reduction of solar heat load. Floor to floor height will be 5 metres to accommodate equipment and allow for cabling under raised floor structures and associated services and ductwork above false ceilings.

51. Internal Finishes Internal finishes will be plain generally, with smooth surfaces to avoid dust problems, particularly in dust sensitive equipment areas. Walls and ceilings to equipment rooms, power rooms and associated offices and general purpose rooms will receive a paint finish. Walls to toilets and kitchen will be tiled and vinyl fabric will be applied to the lift lobbies and cafeteria. Manual assistance centres will be provided with murals and curtaining to create a pleasant working environment and will be carpeted. Floors generally will be screeded and finished with vinyl tiles. Toilets will be surfaced with ceramic tiles and the kitchen with quarry tiles.

52. Mechanical Services Air conditioning will be provided to equipment rooms and normally occupied areas. To maintain continuous air conditioning within strict temperature and humidity tolerances in equipment areas, multiple air handling and refrigeration plants will be installed. Exhaust ventilation will be provided for emergency plant areas, toilets and kitchen and cable chamber. Emergency generating sets will be provided to power equipment and air conditioning plant in the event of failure of the main supply. Other services to be provided include domestic hot water, kitchen equipment, auto-boosted pumps, sump drainage pumps and hoisting equipment.

53. A centralised control and monitoring system for the various building services will be provided on the fifteenth floor.

54. Electrical Services To meet the heavy power requirements of the telecommunications and air conditioning equipment, it will be necessary to supply high voltage power to a number of substations at various floor levels. Critical electrical components will be duplicated to ensure a

high degree of reliability of service. Fluorescent lighting will be provided generally throughout the building and external floodlighting will be installed.

55. Lifts Passenger lifts will be provided by three high rise lifts and a goods service will be provided by one goods lift.

56. Fire Protection The building will be of fire resistant structure generally in accordance with the Uniform Building Regulations. The fire protection system will include a combination of fire detectors and sprinklers, B.C.F. protection in switchboard and substations, manual alarm points, hydrants, portable extinguishers and hose reels.

57. Hydraulic Services Water, sewerage and drainage services will be connected to Metropolitan Water Supply, Sewerage and Drainage Board's mains. Water supply for domestic purposes and cooling towers will be pumped from the mains to a roof storage tank. Fire fighting water supply will be from two separate supply mains as for the domestic system. Above the third floor, the system will be pressurised by a booster connected to the roof storage tank.

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

ESTIMATE OF COST

59. The estimated cost of the work when referred to the Committee was $11.3 million as follows:

	$
Building work	5,380,000
Mechanical services	4,330,000
Electrical services	1,155,000
Lifts	345,000
External services and site works	90,000
	11,300,000

PROGRAMME

60. The target of the Australian Post Office is to have the building completed in August 1976. To meet this target, the Department of Works requires that tenders for the main construction work be invited in September 1973 and that construction on prepared foundation piling commences no later than January 1974. We were told that this timetable necessitates the letting of a separate contract for the foundation piling in advance of the main project. The Department has completed documentation for this work and can proceed immediately the proposal is approved. We were also told that preparation of main contract documents had been commenced prior to the Committee's enquiry to enable the Department of Works to meet the timetable.

OTHER OBSERVATIONS

61. Environmental Considerations The Post Office representatives tabled an "Environmental Impact Statement" at the public hearing. This document is the result of a joint study by the Post Office and the Department of Works and covered such issues as visual, building operations, noise, wind effects and smoke emission, waste disposal, building services, public transport, parking and traffic flow, economics and compliance with the regulations of local authorities. Unfortunately, the document was not made available until towards the end of the public hearing and the Committee were of the opinion that its value as evidence warranted its being provided prior to the hearing in conjunction with the departmental submissions.

62. This proposal is the first to come before the Committee with a specific and detailed "Environmental Impact Statement" incorporated in the evidence. It was noted that as yet the departments responsible for advising

the Government on environmental issues have not given the Department of Works and the sponsoring departments and authorities guidelines for the preparation of these statements. In view of the many proposals which will come before the Committee and which will require careful consideration of environmental factors, the Committee recommend that the Government take appropriate action to set down guidelines for the preparation of "Environmental Impact Statements" as soon as possible.

63. Planning Delays The Committee noted that as was the case for several recent large building proposals by the Australian Post Office, the work had not been brought to the Committee at the appropriate stage of the planning with the result that at the time of the enquiry work had been carried out on the detailed design of the project well in excess of that normally required for the work to be presented to the Committee. Notwithstanding disruptions caused by the elections and change of Government at the end of 1972, it is apparent that there is a continuing inability of the Post Office to plan adequately a number of its works proposals in sufficient time to avoid the necessity for proceeding with detailed designs in anticipation of a favourable report by the Committee.

64. The Committee believe that an examination of the Post Office's planning arrangements is warranted with the aim of effecting changes in policy or overcoming shortcomings in procedures and resources to avoid late referral of proposals in the future.

RECOMMENDATIONS AND CONCLUSIONS

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

		Paragraph
1.	THERE IS A NEED TO PROVIDE ADDITIONAL FACILITIES IN VIEW OF THE CAPACITIES OF THE EXISTING EXCHANGES BEING REACHED IN 2 TO 4 YEARS.	22

		Paragraph
2.	THE NEW FACILITIES SHOULD PROVIDE FOR MAXIMUM REPLACEMENT OF OBSOLETE EQUIPMENT.	22
3.	THE COMMITTEE AGREE THAT THE ADDITIONAL FACILITIES SHOULD BE PROVIDED IN THE PROPOSED WELLINGTON EXCHANGE.	22
4.	THE FUNCTIONS PROPOSED FOR THE NEW EXCHANGE ARE APPROPRIATE.	35
5.	THE COMMITTEE AGREE THAT THE PROPOSED EXCHANGE SHOULD BE LOCATED ADJACENT TO THE EXISTING CENTRAL EXCHANGE BUILDING.	36
6.	THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	58
7.	THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS $11.3 MILLION.	59
8.	THE COMMITTEE RECOMMEND THAT THE GOVERNMENT SET DOWN GUIDELINES FOR THE PREPARATION OF "ENVIRONMENTAL IMPACT STATEMENTS" AS SOON AS POSSIBLE.	62
9.	AN EXAMINATION OF THE POST OFFICE'S PLANNING ARRANGEMENTS IS WARRANTED WITH THE AIM OF EFFECTING CHANGES IN POLICY OR OVERCOMING SHORTCOMINGS IN PROCEDURES AND RESOURCES TO AVOID LATE REFERRAL OF PROPOSALS IN THE FUTURE.	64

(W.J. Fulton)
Chairman

Parliamentary Standing Committee on
Public Works,
Parliament House,
CANBERRA, A.C.T.
3 May 1973.