

1925.



THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

*Senator Lyne*

Pursuant to Statute  
By Command  
In return to Order

PARLIAMENTARY STANDING COMMITTEE  
ON PUBLIC WORKS.

*W. H. R. [Signature]*  
Clerk of the Senate.  
24 June, 1925.

# REPORT

TOGETHER WITH

## MINUTES OF EVIDENCE

RELATING TO THE PROPOSED ESTABLISHMENT OF AN

# AUTOMATIC TELEPHONE EXCHANGE

AT

# WEST ADELAIDE, SOUTH AUSTRALIA.

Printed and Published for the GOVERNMENT of the COMMONWEALTH of AUSTRALIA by H. J. GREEN, Government Printer for the State of Victoria.

No. —PRICE —F.5674.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

(Fourth Committee.)

The Honorable HENRY GREGORY, M.P., Chairman.

Senate.

House of Representatives.

Senator John Barnes,†  
 Senator Mattil Spencer Poll,†  
 Senator Patrick Joseph Lynch,†  
 Senator John Nowland,†  
 Senator William Plain,\*  
 Senator Matthew Reid,†

Arthur Blkeley, Esq., M.P.  
 Robert Cook, Esq., M.P.  
 David Sydney Jackson, Esq., M.P.  
 George Hugh Mackay, Esq., M.P.  
 James Mathews, Esq., M.P.

\* Ceased to be a Member of the Senate, 30th June, 1923.

† Appointed 6th July, 1923.

‡ Resigned 28th June, 1924.

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COPY OF EXECUTIVE COUNCIL MINUTE No. 28, DATED 17TH DECEMBER, 1924.

Department of Works and Railways,  
 12th December, 1924.

MINUTE PAPER FOR THE EXECUTIVE COUNCIL.

Subject:—Reference to Parliamentary Standing Committee on Public Works.

Departmental  
 No. 28.

Executive  
 Council No. 55

Recommended for the approval of His Excellency the Governor-General in Council that, in accordance with the Commonwealth Public Works Committee Act 1913-1921, the following work be referred to the Parliamentary Standing Committee on Public Works for investigation and report thereon to the House of Representatives, viz:—

West Adelaide, South Australia.—Establishment of Automatic Telephone Exchange.

(Signed) W. C. HILL,

Minister of State for Works and Railways.

Filed in the Records of the Executive Council,

(Signed) J. H. STARKING,  
 Secretary to the Executive Council.

Approved in  
 Council.  
 (Sgd.) ROBERT,  
 Gov.-General,  
 17th December,  
 1924.

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WEST ADELAIDE AUTOMATIC TELEPHONE EXCHANGE.

REPORT.

The Parliamentary Standing Committee on Public Works, to which His Excellency the Governor-General in Council referred, for investigation and report to the House of Representatives, the question of the proposed establishment of an Automatic Telephone Exchange at West Adelaide, South Australia, has the honour to report as follows:—

PROPOSAL.

1. The proposal submitted is to erect a telephone exchange building on a site which has already been acquired in Wainhouse-street, Torrensville, South Australia, and to install therein an automatic telephone switching system having an immediate capacity of 2,200 subscribers' lines, and an ultimate capacity of approximately 5,000 subscribers' lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, thereby affording sufficient accommodation for the anticipated development in the West Adelaide area.

REASONS FOR PROPOSAL.

2. The new exchange is designed to serve a portion of the city of Adelaide which is at present catered for by the Central, Prospect, Woodville, and Henley Beach exchanges. The greater part of the area is outside the 2-mile limit of the existing exchanges referred to, and most of the subscribers in what will be the West Adelaide area are now required to pay excess mileage rates for their telephone service. The area to be served covers a very thickly populated district including the suburbs of Torrensville, Thebarton, and Hindmarsh.

3. It is claimed that the opening of the new exchange is rapidly becoming a matter of extreme urgency in order to afford relief to the Central exchange, which is said to have almost reached the limit of the capacity of the existing plant and building, and it is represented that if the proposal is not proceeded with it will be necessary to extend the building and equipment of the existing exchanges which serve the area. On the other hand, with the establishment of the exchange as proposed, it is claimed that it will be possible to render a more efficient service to existing and prospective subscribers than can be done under present conditions.

ESTIMATED COST.

4. The estimated immediate cost of the proposal as submitted to the Committee is set down at:—

Site .. .. .	£525
Building .. .. .	7,650
Air-conditioning, heating, ventilating, vacuum-cleaning and air compression plant .. .. .	4,250
Exchange equipment, including that necessary at other exchanges ..	39,396
Sub-station equipment .. .. .	8,244
Diversion of line plant and cut-over of equipment .. .. .	350
	£60,415

## COMMITTEE'S INVESTIGATIONS AND RECOMMENDATIONS.

5. The Committee visited Adelaide and inspected the site proposed for the building and portion of the area which would be served by the new exchange. Careful attention was given to the plans submitted, and evidence was taken from the Telephone and Works officials concerned with the proposal.

## SITE.

6. The site, acquired for the sum of £525, has a frontage of 88 feet to Wainhouse-street by a depth of 150 feet, and is level in character. In this, as in most cases in Adelaide, the land is not good for foundations, but the necessary provision will be made for reinforcing the foundations in order to ensure that the building when erected will be satisfactory.

## BUILDING.

7. It is proposed that the building shall be of simple design and built on the latest fire-resisting principles. It is to be of one story, and constructed of brick with cement dressings. There will be a switchroom 91 feet by 40 feet, and 14 feet from floor to ceiling. There is also to be a battery room 32 feet by 22 feet, with lavatory and stores room adjacent, a small staff room, and an air-conditioning room 22 feet by 17 ft. 6 in., with a boiler room 5 feet wide off it. It is proposed that the floors shall be of concrete and ceilings of reinforced concrete, the main switch room in addition to have a timber-framed roof covered with local Willunga slates. The roof for the battery room, staff room, and air-conditioning room will be flat.

8. The Committee questioned the necessity for the class of roof proposed, and ascertained that if the rooms other than the switch room be covered with galvanized iron outside and small fluted galvanized iron or fibrous plaster ceilings, a saving could be effected of approximately £180. While an additional saving of approximately £224 could be effected by covering the main roof with galvanized iron instead of slates.

As the Committee is satisfied that it would be no detriment to the building if the cheaper form of construction were adopted, it recommends accordingly.

## FINANCIAL ASPECT.

9. It was stated in evidence that the total annual charges, including interest and depreciation, for the proposed automatic system as at the date of establishment, viz., 1st January, 1928, are estimated at £19,645, and five years later at £23,151. The estimated revenue at 1st January, 1928, is set down at £21,735, and five years later at £31,878. The assets thrown spare if the automatic equipment is installed on 1st January, 1928, are estimated to have a recoverable value of £28,709.

## COMMITTEE'S RECOMMENDATION.

10. Under these circumstances, the Committee has no hesitation in recommending that with the alteration to the roof mentioned above, the proposed installation of an automatic telephone exchange at West Adelaide as proposed by the Department be put in hand ~~as early as possible~~ <sup>as early as possible</sup>.

H. GREGORY,  
Chairman.

Office of the Parliamentary Standing Committee on Public Works,  
Parliament House, Melbourne, 28th May, 1925.

## MINUTES OF EVIDENCE.

(Taken at Melbourne.)  
FRIDAY, 17th APRIL, 1925.

## Present:

Mr. GREGORY, in the Chair;  
Senator Barnes | Mr. Cook  
Senator Lynch | Mr. Mathews.

Lawrence Bada Fanning, Superintendent of Telephones, Central Administration, Postmaster-General's Department, sworn and examined.

1. To the Chairman.—The details of the proposal are contained in the following statement.—The proposal before the Committee is to erect a telephone exchange building on a site which has already been acquired in Wainhouse-street, Torrens-ville, South Australia, and to install therein an automatic telephone system having a capacity at the outset of 2,200 lines, and an ultimate capacity of 5,000 subscribers' lines. The initial equipment installed will be capable of extension to the ultimate capacity mentioned which it is anticipated will be reached in 20 years, and will afford sufficient accommodation to meet the development in the West Adelaide area.

The new exchange will serve a portion of the city of Adelaide which is at present catered for by the Central, Prospect, Woodville, and Henley Beach exchanges. The greater part of the area is outside the 2-mile limit of the existing exchanges referred to, and most of the subscribers in the area are required to pay excess mileage rates for their telephone services. The area to be served covers a very thickly populated district, including the suburbs of Torrens-ville, Thebarton, and Hindmarsh.

The opening of the new exchange is rapidly becoming a matter of extreme urgency in order to afford relief to the Central Exchange which has almost reached the limit of the capacity of the existing plant and building, and unless the proposal is proceeded with it will be necessary to extend the buildings and equipment of the existing exchanges which serve the area.

As the Committee is aware, it has already been approved to gradually convert the whole of the existing manual exchanges in Adelaide to automatic working, and the conversion of the existing manual exchanges at Woodville, Henley, Glenelg, Brighton, and Prospect to automatic working is proceeding. Approval has also been given to convert the semi-automatic exchanges at Unley and Norwood to full automatic.

The estimated cost of the new exchange is as follows:—

Site	£
Building	525
Air conditioning, heating, ventilating, vacuum cleaning, and air-compression plant	7,650
Exchange equipment including that necessary at other exchanges	4,250
Sub-station equipment	39,796
Diversion of line plant and cut-over of equipment	8,244
	350
	£60,415
	—

The revenue derived, and the revenue it is estimated will be obtained on the date of transfer, viz., 1st January, 1928, and with five years' development, is shown hereunder:—

Number of subscribers' lines connected as at 31st July, 1925.	Annual revenue received for the year ended 31st July, 1925.	Estimated number of subscribers' lines, 1st January, 1928 (date of takeover).	Estimated annual revenue 1st January, 1928.	Estimated number of subscribers' lines, 1st January, 1933 (five-year date).	Estimated annual revenue, 1st January, 1933.
884	£12,907	1,200	£21,735	2,200	£31,878

The proposed building is to be of simple design, and built on the latest fire-resisting principles. The building will be designed sufficiently large to accommodate the equipment which it is anticipated will be ultimately installed at West Adelaide.

The financial aspect of the proposal is as follows:—

As at 1.1.1928. As at 1.1.1933.

Item.	£	£
1. Capital cost—new	60,415	68,405
2. Capital cost—new and in situ	173,622	194,607
3. Annual working expenses of proposed automatic system	5,654	7,123
4. Total annual charges for proposed automatic system	19,645	23,151
5. Annual revenue	21,735	31,878
6. Assets recoverable or thrown spare if automatic exchange is installed on 1st January, 1928—		
(i) Book value	35,143	—
(ii) Recoverable value	28,709	—
(iii) Cost of recovery	1,198	—
7. Proportionate annual working expenses of existing manual system as at 31st December, 1927	8,184	—
8. Proportionate annual charges for existing manual system as at 31st December, 1927	16,619	—
9. Amount by which the revenue exceeds the annual charges for the proposed automatic system	2,090	8,727

Regarding item 6 of the foregoing statement, the difference between sub-items (i) and (ii), viz., £6,434, is an amount which will have to be written off in the departmental accounts as representing the proportion of the capital outlay on the original asset which is irrecoverable, and includes depreciation due to wear and tear and labour in installation.

2. To Senator Lynch.—The cost of recovery, £1,198, would be debited to the exchange if we incurred the expenditure, but in this case we shall not recover any of the equipment, because the equipment thrown spare will be used for other subscribers.

3. To the Chairman.—The reason why the revenue per subscriber is more at West Adelaide than at Manly is that most of the subscribers who will be connected with the West Adelaide exchange are now connected

with the Central exchange, and their calling rate is much higher. The calling rate per subscriber at Manly would be about four a day, whereas in the Adelaide case it would be about ten a day. The average revenue is £15 per subscriber, as against £10 at Manly. A proposal will shortly be submitted for a new Central automatic exchange at Adelaide. Automatic exchanges have already been approved for Henley Beach, Woodville, Semaphore Glenside, Brighton, Unley, and Newwood. When these are completed there will only be Port Adelaide and Central in the Adelaide network left to be converted. Proposals are in course of preparation for the conversion of both those exchanges to automatic working, and they will be submitted at an early date. I suppose that by 1929 or 1930 the whole of the Adelaide network will be equipped with the automatic system.

4. To Mr. Matthews.—You ask me the reason for the estimated increase in capital cost, new and *in situ*, from £173,622, as at 1st January, 1928, to £194,607 as at 1st January, 1933. The answer is that the exchange will develop 700 lines in the meantime, and additional expenditure will be incurred in giving the extra service. In addition, there will be the extension of the cables. If we transferred 1,600 subscribers to the proposed new exchange, principally from Central, the equipment thrown spare could be used at Central to enable us to carry on until we had converted that exchange to the automatic system.

(Taken at Sydney.)

TUESDAY, 21st APRIL, 1928.

Present:

Mr. GEORGE, Chairman;

Senator Barnes | Mr. Blakely  
Senator Reid | Mr. Cook

John Murray Crawford, Chief Electrical Engineer, Postmaster-General's Department, sworn and examined.

5. To the Chairman.—The proposal is to erect a telephone exchange building on a site in Wainhouse-street, Torrensville, South Australia, and to install therein an automatic telephone switching system having an initial equipment of 2,300 subscribers' lines and an ultimate capacity of approximately 5,000 subscribers' lines. It is proposed that initial equipment shall be capable of extension to the ultimate capacity named, thereby affording sufficient accommodation for the anticipated development in the West Adelaide area. The prospective development in the area is such that it is imperative an exchange be established therein in order to afford relief in the Central Exchange, which is fast becoming unduly congested. If the establishment of an exchange in the area be approved it will be possible to render a more efficient service to existing and prospective subscribers than is possible under present conditions.

The estimated immediate cost of the work is:—

Site .....	£ 525
Building .....	7,680
Air conditioning, heating, ventilating, vacuum cleaning, and air compression plant .....	4,260
Exchange equipment, including that necessary at other exchanges .....	39,396
Sub-station equipment .....	8,244
Diversion of line plant and cutover of equipment .....	350
£60,415	

The revenue derived and the revenue it is estimated will be obtained on the date of transfer, viz., 1st January, 1928, and with five years' development is shown hereunder:—

Number of Subscribers' Lines connected as at 31.12.27.	Annual Revenue received for the year ended 31.12.27.	Estimated Number of Subscribers' Lines 1.1.28 (Date of Cutover).	Estimated Annual Revenue, 1.1.28.	Estimated Number of Subscribers' Lines 1.1.33 (Five-Year Date).	Estimated Annual Revenue, 1.1.33.
864	£ 12,907	1,600	£ 21,735	2,200	£ 31,878

It is proposed that the building shall be of simple design and built on the latest fire-resisting principles. The immediate installation in the exchange is for an equipment of 2,300 subscribers' lines, but the building will be designed sufficiently large to accommodate equipment having a capacity of approximately 5,000 lines.

The financial aspect is as follows:—

1. Capital cost—new	At 1.1.28	At 1.1.33
2. Capital cost—new and <i>in situ</i>	60,415	98,405
3. Annual working expenses of proposed automatic system	173,622	194,607
4. Total annual charges for proposed automatic system	6,654	7,123
5. Annual revenue	19,645	21,735
6. Assets recoverable or thrown spare if automatic exchange is installed on 1st January, 1928:—		
(i) Book value	35,143	—
(ii) Recoverable value	23,709	—
(iii) Cost of recovery	1,198	—
7. Proportionate annual working expenses of existing manual system as at 31st December, 1927	8,184	—
8. Proportionate annual charges for existing manual system as at 31st December, 1927	16,619	—
9. Amount by which the revenue exceeds the annual charges for the proposed automatic system	2,090	8,727

Regarding item 6 of the foregoing statement, the difference between sub-items (i) and (ii), viz., £20,434, is an amount which will have to be written off in the departmental accounts as representing the proportion of the capital outlay on the original asset which is irrecoverable, and includes depreciation due to wear and tear and labour in installation. The area covered by the proposed exchange will be to the west of the park land for a distance of about a mile. When this exchange is erected it will complete the net-work around Adelaide, except for the Semaphore district. The Central exchange will then have to be converted. The proposal for this is nearly ready. The site for the West Adelaide exchange has been purchased. The building will follow the usual lines. It will be a one-story structure. I do not know that it is essential to have a concrete ceiling over the air-conditioning portion of the building. Another type of ceiling, if it were cheaper, would be quite satisfactory to us. We do not install air-conditioning plants, and contracts for them are not arranged for by our Department. We do not accept any air-conditioning plant until it is

working in good order. All arrangements for the installation of such a plant are carried out by the mechanical engineers of the Works and Railway Department. If we found that an air-conditioning plant was costing more than it should we would be neglecting our duty if we did not call attention to the fact, but we really have the data with which to closely check its cost. All we can do is to compare the plant at West Adelaide with that at, say, Gordon to see whether the cost in both exchanges is approximately the same. We do that now, and to that extent we are satisfied, but I cannot say that we have ever gone into the details of the construction of these air-conditioning plants to see whether we could get them at a less cost if we installed them ourselves. If we found that a plant was costing too much to run, and was not giving efficiency, of course we should make representations. If we found that the cost of an air-conditioning plant was more here than it is in New Zealand, we should draw attention to the difference. It is just at that point that I have found it is not wholly an advantage to have one department supplying an integral part of a telephone exchange and another department supplying another part, though, of course, the system has certain advantages. I am satisfied with the type of building proposed to be erected at West Adelaide. It is to supply a changing suburb, which in Sydney would probably compare with Newtown or Glebe. That is to say, it is a district which is changing from residential to business. You get a higher proportion of private-branch exchange switchboards in such a district than you would have at, say, Henley Beach or at Gordon. The amount of revenue likely to be derived from a new telephone exchange is largely determined by the character of the area. More revenue is derived per subscriber in a business district than in a suburban area. In the case of West Adelaide our revenue estimate—about £14 10s. 6d. per subscriber—is higher than one that might be made for other areas, but it is not high compared with Glebe or Newtown. I do not know the area well enough to tell you precisely what the type of subscriber is likely to be, but from my knowledge of Adelaide I should say that West Adelaide would give us a revenue of £14 10s. a line. We have kept down our estimates in order not to forecast something that may prove unduly liberal. The capital cost, now, will be increased by £8,000 in five years, whereas the capital cost, now and *in situ*, will increase by £21,000 in the same period. New capital cost is very largely represented by apparatus. As you are aware, all the frame units for the additional five years which are erected initially, will cost more than the requirement for two years. The difference between two years and five years, so far as additional switch units are concerned, is represented by £8,000. That amount does not take lines into consideration. There was no need to have two items in my statement to cover the one matter. Nearly £13,000 worth of new lines will have to be put in. I have no reason to doubt that in five years' time we shall be showing a profit of £10,000 a year on this exchange. The department is chiefly losing money on country lines. I think very little is lost in the metropolitan area or in places where we have a fairly high calling rate. Losses are shown in localities where we incur a capital cost of £100 a line and get a rental of £3 a year and very little for calls from it. I do not think that the accountant differentiates between the city and the country in his balance-sheets. We show the Sydney-Melbourne and the Melbourne-Adelaide trunk lines as a separate account. The accountants of the Postal Department, Adelaide, has supplied the following certificate:—

The revenue, £12,907, from subscribers in the West Adelaide area as at the 31st July, 1927,  
is £21,735 at that date was 864.

6. The figures shown in the above-mentioned proposal should be amended as under:—  
Statement of Revenue from the Subscribers in the West Adelaide Area during the Twelve months ended 31st July, 1928.

864 lines, equal to £14.94 per line.		
It connected to New Exchange		
£12,923, equal to £13.45 per line.		
The amounts of £12,907 and £12,523 are made up as follows:—		
12 months ended 31.7.27	If connected to New Exchange	
Rents .....	25,258 1 0	24,574 11 0
Local calls .....	6,070 15 2	6,687 13 4
Trunk calls .....	733 15 10	707 0 5
Other charges .....	244 8 6	231 4 5
	£12,907 3 6	£12,523 13 6

Public telephones included in local calls.

Estimated revenue, 1928—1,600 lines, at £14.94, equal to £21,735.

Estimated revenue, 1933—2,200 lines, at £14.40, equal to £31,878.

6. To Senator Barnes.—The evidence I have given is based on matter prepared in my office from data obtained, to a large extent, from South Australia.

7. To Mr. Cook.—The engineers of the Postal Department confer with those of the Works and Railways Department upon air-conditioning proposals. There is no conflict between the two. The engineers of the Works and Railways Department ascertain our requirements and work them out in detail, and then supply us with a plant which they certify will meet our requirements. Hitherto, we have found that they have been meeting our requirements, although we think that the plants are a bit expensive. I have not given any thought to the question of our department canvassing for business. We are not in a position to cope with the demand we would inevitably get if we did go in for canvassing. It takes us all our time, with the money Parliament makes available, to give service to those who are now clamouring for it. I have always been hoping that Parliament would favorably consider giving an increased vote for an industry such as ours, which will show an absolute and clear profit. We place our estimates before the Treasurer each year, and he deals with them as the policy of the Government dictates, and we have to carry on with whatever money Parliament makes available for us. It is true that we are not able to cater for a lot of business that would show a profit, but we have simply to take whatever the Treasurer allows to us and meet the most urgent of the telephone requirements of the country. We try to spend the money economically, but we often think that we could do better if we had a little more allotted to us. Our vote has almost doubled within the last three years, but at the same time the number of applicants to whom service is being given has also about doubled.

8. To Senator Reid.—The area to be served by the West Adelaide exchange is getting nearer and nearer to the city activities. There is a large number of big firms growing up in it who will want their own switchboards and will have a heavy calling rate. Adelaide is different from most other cities, because it is ringed by park lands, but its business is overflowing beyond those park lands, and West Adelaide is one of the areas affected. It is now supplied by the Central Exchange. The latter will be confined to the area bounded by the park lands, of which the Post Office is almost the precise centre. The Central Exchange is now overloaded, but the establishment of the West Adelaide Exchange will relieve the position. The Melbourne-Adelaide, Melbourne-Sydney, and Sydney-Brisbane trunk lines pay fairly well. The country lines are somewhat of a drag. The long lines between capital cities are very heavily overloaded. It is not fair to ask a business man in Sydney or Melbourne to switch sets and a half or two hours to get communication with his correspondent in another capital. The growth of the business is such

that we are with difficulty able to cope with it. We have a continuous run of calls. As soon as one call is ended another one is commenced. There is no waiting for business. It is lined up ready for us. I think the public would prefer to pay a higher trunk-line rate and get a no-delay service—that is, a service within reasonable limits. A man would not object to waiting a quarter of an hour. At present many calls are cancelled because of the long waits. In fact, we have hundreds of calls cancelled on our long lines. In providing trunk lines we are guided by the business offering, and we endeavour to provide lines capable of meeting that business. The basis of all telephone service is the subscriber. The more subscribers we have the more junction lines and the more trunk line services we require. It is not a bad guide to go by the actual number of additional subscribers offering. When you can say that you have a 10 per cent. increase of subscribers throughout the Commonwealth you are not far wrong in estimating that you will have a 10 per cent. increase in trunk-line business. Subscribers are feeders to the trunk lines, just as streamlets are feeders to a river.

9. *To the Chairman.*—There is no advantage in getting cadmium copper as against ordinary copper for heavier gauges, because the heavier gauges in hard-drawn copper already gives the desired tension. It is only with the idea of getting additional tension that we use bronze, otherwise we would use 40 lb. copper. To get the same tensile strength in copper as is given by 40 lb. cadmium copper one would require about 70 lb. or 80 lb. copper wire.

(Taken at Adelaide.)

TUESDAY, 28th APRIL, 1925.

Present:

Mr. GREGORY, Chairman;

Senator Barnes, Mr. Blakeley,  
Senator Reid, Mr. Cook.

James Simcoe Fitzmaurice, State Engineer, Postmaster-General's Department, Adelaide, sworn and examined.

10. *To the Chairman.*—The provision of a full automatic exchange at West Adelaide forms part of a scheme for the conversion to automatic working of the whole Adelaide metropolitan network. A thorough examination of the economies of a large number of cases has shown conclusively that the automatic system shows substantial economies as compared with the manual, and for this reason the adoption of the automatic system is proposed. A commencement has been made by the placing of orders for automatic equipment for seven exchanges, viz., Prospect, Glenelg, Brighton, Henley, Woodville, Unley, and Norwood; and it is essential that any exchanges subsequently established should also be automatic, otherwise the full benefit will not be obtained from the system, and much needless expense would be involved. Apart from the question of providing for future requirements in the area, there is the question of rentals to be considered. It is estimated that about 50 per cent. of the subscribers are outside the 2-mile radius from any existing exchange, and are consequently required to pay increased rentals. It is considered that a large number of prospective subscribers are deferred from making application for service on this account, and the establishment of the proposed exchange, with the consequent reduction of rentals, would result in a great increase in the number of subscribers. A site for the exchange has already been acquired near the theoretical telephone centre of the area. This site is situated in Wainhouse-street, Torrensville, and was acquired at a cost of £526.

At the present time, the West Adelaide subscribers connected to other exchanges are as follow:—

Central .. .. .	1,128
Glenelg .. .. .	24
Unley .. .. .	13
Henley .. .. .	30

Waiting applicants .. .. .	1,204
	26
	1,230

It is anticipated that by 1st January, 1928, there will be 1,500 lines in the area, and it would be impracticable to connect more than this number to Central, which has practically reached the limit of its capacity. The transfer of the West Adelaide lines would enable, approximately, two and a half years' normal (Central) growth to be accommodated, and obviate expensive and uneconomical extensions to the Central Exchange. It would be practically impossible to provide service on Central Exchange to West Adelaide subscribers beyond about 1st January, 1928, and after that date it would be necessary to refuse service unless an exchange in the West Adelaide area is provided. It is therefore urgently necessary that early action should be taken to provide an exchange in this area if service is not to be refused in the near future. The proposal is to erect a telephone exchange building on a site in Wainhouse-street, Torrensville, South Australia, and to install therein an automatic telephone switching system having an initial equipment of 2,200 subscribers' lines, and an ultimate capacity of, approximately, 5,000 subscribers' lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, thereby affording sufficient accommodation for the anticipated development in the West Adelaide area. The prospective development in the area is such that it is imperative an exchange be established therein in order to afford relief in the Central Exchange, which is fast becoming unduly congested. If the establishment of an exchange in the area be approved, it will be possible to render a more efficient service to existing and prospective subscribers than is possible under present conditions. The estimated immediate cost of the work is—

Site .. .. .	£525
Building .. .. .	7,950
Air-conditioning, heating, ventilating, vacuum-cleaning, and air-compression plant .. .. .	4,250
Exchange equipment, including that necessary at other exchanges .. .. .	39,396
Sub-station equipment .. .. .	5,244
Diversion of line plant and cut-over of equipment .. .. .	360
	£60,416

The actual and estimated revenue derived, and the revenue it is estimated will be obtained on the date of transfer, viz., 1st January, 1928, and with five years' development, is shown hereunder:—

Number of Subscribers Lines connected as at 31.7.23.	Annual Revenue received for the Year ended 31.7.23.	Estimated Number of Subscribers' Lines, 1.1.28 (Date of cut-over).	Estimated Annual Revenue, 1.1.28.	Estimated Number of Subscribers' Lines, 1.1.33 (Five-year date).	Estimated Annual Revenue, 1.1.33.
864	12,007	1,500	21,735	2,200	31,878

It is proposed that the building shall be of simple design, and built on the latest fire-resisting principles. The immediate installation in the exchange is for an equipment of 2,200 subscribers' lines, but the building

will be designed sufficiently large to accommodate equipment having a capacity of approximately 5,000 lines.

FINANCIAL ASPECT.

Item.	As at—	
	1st January, 1923.	1st January, 1923.
	£	£
1 Capital Cost—New .. .. .	60,416	68,405
2 Capital Cost—New and in situ	173,922	104,507
3 Annual working expenses of proposed Automatic System .. .. .	5,654	7,123
4 Total annual charges for proposed Automatic System .. .. .	10,645	23,151
5 Annual revenue .. .. .	21,735	31,878
6 Assets recoverable or thrown spare if Automatic Exchange is installed on 1st January, 1928—		
(i) Book value .. .. .	55,143	..
(ii) Recoverable value .. .. .	26,778	..
(iii) Cost of recovery .. .. .	1,198	..
7 Proportionate annual working expenses of existing Manual System, as at 31st December, 1927 .. .. .	8,184	..
8 Proportionate annual charges for existing Manual System, at 31st December, 1927 .. .. .	16,010	..
9 Amount by which the revenue exceeds the annual charges for the proposed Automatic System .. .. .	2,000	8,727

Regarding item 6 of the foregoing statement, the difference between items (i) and (ii), viz., £28,364, is an amount which will have to be written off to the departmental accounts as representing the proportion of the capital outlay on the original asset, which is irrecoverable, and includes depreciation due to wear and tear and labour in installation. The undermentioned figures show the average earning value per subscriber's line, based on the latest available actual revenue figures for one year:—

Central .. .. .	£28.6
Port Adelaide .. .. .	21.9
Unley .. .. .	16.4
Norwood .. .. .	14.8
West Adelaide .. .. .	14.49

The average revenue per subscriber in metropolitan area for year ended 30th June, 1925, was £15.66. The figures for Central, Port Adelaide, Unley, and Norwood are as at 31st December, 1924, and that of West Adelaide as at 31st December, 1923. The Accounts Branch inform me that it would take a considerable time to go through the subscribers' cards and give the actual revenue received for the 1,204 subscribers who are at present in the West Adelaide area and connected to Central, and they consider the estimate of £14.49 is a reasonable one. With reference to the question as to whether the financial aspect in item 1 for the five-year period should not be increased by the addition of the new line plant as shown in item 2, the present form was submitted in accordance with Central Office instructions; but in any case the amount of £12,006 for new line plant would have been necessary to provide for the five-year period whether the automatic exchange was erected or not, provided service could be given from other sources. I have made a special investigation of the district. In connexion with each of these exchanges we have to make a telephone survey in order to ascertain the telephone centre and to fix upon the best point for the distribution of our cables. I have here a plan, which I hand to the Committee, showing the lay-out of the various exchanges. In the laying out of this site consideration has been given to the possible future development. In considering the location of a site we make inquiries from all sources, including land agents, in order to obtain the most authentic evidence of possible settlement

F.5674.—2

and expansion. In this particular case I consulted Mr. Wyatt, Clerk of the Thornbarnt Council, who gave me a good deal of assistance. The usual practice is to consult the local authorities in order that the fullest particulars may be obtained. In this instance I originally selected another site, but before negotiations could be entered upon for its purchase a building was erected upon it. The conditions are very congested in this district and we were confined to one or two sites only. Fortunately we were able to secure the present site, which is an excellent one for the lay-out of our cables. The fire risk is a good one, as there will be a considerable space on each side of the building. Already the erection of seven automatic exchanges has been approved in the Adelaide network, and tenders for them have been accepted. It takes about seventeen to nineteen months to deliver and install the material. The tenders were accepted about two months ago. Most of the buildings have been erected. Those at Unley and Norwood have not yet been started, but those at Prospect, Henley, Brighton, Glenelg, and Woodville have been erected. The plan, I anticipate, will arrive in the near future. In the Central Exchange we have an up-to-date common battery system which is giving excellent service, and I could not justify scrapping it for the purpose of initiating the automatic system there. That will probably be the last exchange to be cut over to the automatic system. I do not think the necessity for the automatic system exists so greatly there as it does in the suburbs. Ultimately, of course, the whole of the metropolitan area will be served by the automatic. Previously the Department has investigated the economics of the manual compared with the automatic system, and it has been shown conclusively that with the latter substantial economies can be effected. I do not think it is likely that the cost will be reduced by £1 per subscriber. The expenses under both systems have increased, and we now estimate that the automatic system will cost from £15 to £20 a line to install. With this exchange, into which the Committee is inquiring, the estimate of cost is about £17 a line for the equipment and the apparatus. I am perfectly satisfied, however, that under the automatic system economies will be effected. In five years' time, after payments of interest and making provision for depreciation of plant, I believe that there will be a substantial reduction and a good profit returned. To begin with, there will be a large saving in staff. There will be no telephone attendants except on the trunk-line positions. When we first inquired into the matter we were of the opinion that the number of staff would be substantially greater than has since been shown to be necessary. Therefore a much larger expenditure was allowed for in that direction. We now know that the very little greater than is required for a manual exchange, whilst under the former we are able to dispense with the services of the attendants. We have not yet had full automatic working. At Norwood and Port Adelaide the service has been semi-automatic. All the plants that are installed will be interchangeable. I have not yet seen the tenders, but I am given to understand by the engineer, who came to Australia as the representative of the British General Electric Company, that the plants are to be made interchangeable. Personally, I do not attach much weight to the possibility of a monopoly being created in the supply of these plants. We have other monopolies in the Gas Company and the Electric Light Company, but they do not charge an exorbitant rate for their supplies. The subscribers in West Adelaide, who are outside the 2-mile area, have to pay an extra 10s. for each quarter of a mile. That extra rental amounts in the aggregate to about £400 a year. When this exchange is operating those subscribers will pay the minimum rate of 5s a year. The increased number of subscribers connected with the exchange will make good any loss of revenue to the Department in that direction. Those West Adelaide

subscribers who at present are connected to other exchanges will be transferred to the West Adelaide Automatic Exchange. We anticipate that further applications will be received from within that area. At present there is a large number of applications outstanding. We cannot connect any more to the Prospect Exchange. We are now putting in extra posts to fix us over until the new Prospect Exchange is established. We installed a magnet switchboard in the motor garage to enable us to give an additional 300 subscribers service. Now we have to make a further extension to that shed to provide for about 1,600 subscribers. The same thing applies to Norwood. The contractors are some what behind in their deliveries, and until we get the switches we cannot give the extra service. It is urgently necessary for action to be taken to relieve the congestion. From the date that approval is given a period of about eighteen months must elapse before the cut-over. We estimate that we can carry on at Central for approximately two years, but not beyond that time. The contractors have about eighteen or nineteen months in which to deliver the material which will take about eight months to install. A tremendous amount of work is involved. We cannot install the whole of the plants simultaneously. Our staff is limited, but we are making provision for additional mechanics to be trained in time for the cut-over. Some of our staff have been sent across to the other States for experience in the new system.

11. *To Senator Reid.*—The actual work of installing will take eight months in the case of each exchange.

12. *To the Chairman.*—It is a very slow job, and only a few men can work at it at a time. The time taken in erecting the machinery will not be long; it is the cables and switches that will take the time. The ultimate capacity allowed for at West Adelaide is 5,000 subscribers' lines. The estimates of costs were supplied by us to hand offices in Melbourne. The figure £39,296 includes £2,796 for junction line equipment at other exchanges to obtain service to those exchanges. West Adelaide must have automatic connexion with Central and with Henley Beach. Those exchanges will repeat from West Adelaide to the other exchanges. A subscriber in West Adelaide will be able to get direct connexion with, say, Woodville, through the junction line equipment; there will be no necessity to ring up Central. In taking out our estimate of costs, we have made a separate item of the labour cost. The labour will be undertaken principally by our permanent staff. The design of the building is the work of the Works and Railways Department. We advised them of the space that we would require. They made the necessary provision for the installation of the air conditioning plant. Two sets of doors at the front of the building will prevent the entrance of dust to the exchange. At the side of the building is a door which will be used only for taking in equipment. The reinforced concrete ceiling has been provided as a precaution against fire. Provision is made for a parapet wall all round the building. I think it is necessary to have a reinforced concrete roof over the battery room, to have a cooling effect in that room. There is a great deal of loss by evaporation if the temperature is hot. At present, by the use of a mineral oil, we keep down the evaporation very materially. The battery room will be connected to the air conditioning plant. If there were a galvanized iron roof over the battery room the fumes would very quickly destroy the iron.

13. *To Mr. Cook.*—I have nothing to do with the construction of the building. Unless you could obtain hard-pressed bricks, I think that concrete would be a better material. With its use, it would be possible to make the walls much thinner if that were desired. At one time we canvassed for subscribers, but we had to give it up. In the country districts, the subscribers applied in such numbers that we were not able to obtain the supplies necessary to cope with them. The canvass

increased the number of applications marvellously, and until we were able to secure construction material and exchange equipment, we were in a hopeless mess. At the present time, we have in South Australia about 600 applications a month. We are only too pleased to fulfil orders, if possible, but we have not been able to do so. I have already shown that there are 300 subscribers waiting at Unley and Norwood, but until we can obtain the equipment, we are unable to give them service. We are losing revenue by our inability to do so. Since the war there has been a phenomenal expansion all over the world. America, Great Britain, and Europe have not been able to keep themselves supplied. It can thus be imagined how Australia, which is so far removed from the centre of the manufacturing industries, has fared. In an exchange of 100,000 lines, it is necessary to have a first selector, a second selector, a third selector, and a connector. They are very costly. The first selector selects the exchange you call; the second selector selects the thousands of that exchange; the third selector selects the hundreds of thousands of that exchange; and the connector has the double function of selecting the tens and the units of the hundreds of thousands. Each of those constitutes a big bank of switches, which automatically give you the service. There are five or six different systems. The Strowger system, with modifications, is that which is being supplied in Western Australia. We have not made comparisons of costs with the other States. The material shortage is gradually being overcome. We were very much behind with our connexions at this time last year, but we are catching up very rapidly, especially in the country. Our average mileage of line for each subscriber is from 4½ to 5 miles, due to the fact that we have very long distances to traverse. It is not a singular experience to receive an application from a subscriber who is 14 or 20 miles out. Farrell's Flat was almost a hamlet when I came here in 1913, but owing to the liberal policy of the Government, and to the canvass that was made, twenty-three applications were received, involving the erection of 1,000 poles. We have standardized the steel beam construction because of the difficulty of securing wooden poles, and of those we have used thousands.

14. *To Senator Barnes.*—Those 23 subscribers are charged the mileage rate. The estimated cost of £60,415 is inclusive of everything. The building cannot be held responsible for the time that will elapse until the cut-over. At Prospect, Woodville, Brighton, Henley, and Glenelg, we have the buildings, but not the plant. There has been considerable delay in getting the tenders. When they were received, they had to be referred back to the tenderers because certain information was not supplied. Tenders for these plants are invited as soon as parliamentary approval is given. It takes a firm nearly six months to get an estimate. Our plans and requirements have to be sent home, and the firm's engineers have to go into them very closely to enable them to give an estimate of the cost. The manufacture of these plants is protected by patents. I should hardly think it would pay to establish the industry in Australia. The firms who are at present manufacturing the plants are supplying not only Australia, but other parts of the world, and they can do it much more cheaply than we could do it here with our labour costs. It would require an enormous outlay to establish a plant in Australia. I have not consulted any of my colleagues regarding that aspect of the matter. If anything were done, I should think it would have to be by arrangement with one of these firms which are at present manufacturing the plants.

15. *To Mr. Blakeley.*—The first cost of the beams that we are now using is, of course, very much higher than in the case of wood. Under the provisions of the licenemen's award every wooden pole has to be examined at least once a year to see that it is safe. That represents an enormous outlay. Troubles are also caused by white ants. Most of the lines in Adelaide are under

the ground. In West Adelaide, some of the lines will be above and others underground.

16. *To Mr. Cook.*—Whether the annual inspection of the poles is warranted or not, under the provisions of the award, it has to be done. With the iron poles that is not necessary. They have a life of from 40 to 60 years at least, and there are no white ant or dry rot troubles. Jarrah, blue gum, and red gum are very susceptible to dry rot.

17. *To Mr. Blakeley.*—We have used tens of thousands of second-hand rails. We have secured all the rails which the South Australian Railways Department could give us; they use them very largely. I suppose they are used more in this than in any other State in the Commonwealth. The Commonwealth Government is taking up a lot of line up towards Oodnadatta; we are using up those as fast as they can give them to us.

18. *To Senator Reid.*—West Adelaide is a big township. It is an average working man's residential area, and there are some big businesses all along the Torrens. There is quite a number of manufacturers down there. In the vicinity of the exchange it is all residential, comprising both professional and industrial classes. In some of the suburbs of Melbourne, you would not get the fine class of residences that you get at Unley and Norwood. Out towards Kewick, which will take in West Adelaide, there is a huge public waterworks in addition to Jones's jam factory, Harris Scarf's, and quite a lot of other works. I think our statistics show that about one in every four of the population has a telephone. For a small exchange, the automatic system is the more expensive, but where you have a system of automatic exchanges with satellite exchanges that take the place of the manual, the automatic is the cheaper. If we had a system of large exchanges, such as Central, Unley, and Norwood, on the manual, it would not be economical to establish the automatic at, say, Brighton. With the manual system, our troubles increase as the exchange becomes enlarged, because you cannot add to a manual exchange as economically as you can to an automatic. Take our central exchange. It now has about 9,000 lines. Each of those 9,000 lines has to be multiplied right along the board so that a girl can connect you with any number from 1 to 9,000. That is not necessary with the automatic. The recovery cost of £2,000 refers only to labour. It would be of no use to allow the cable to lie idle in the ducts. That has all to be taken out, unjointed, tested, sealed up, and used in other places. It is necessary to expend that amount in order to recover the cable.

19. *To the Chairman.*—I do not know whether the revenue derivable from the West Adelaide district will be greater than that at Unley or Norwood, which are very influential districts. I should say that the revenue per subscriber will be practically the same. The estimates of revenue have been obtained by us from the accountant. They are based on actual returns. In five years' time we will have added £8,000 to the capital cost, inside the building. Item No. 2—capital cost new and in situ—includes additions outside the exchange equipment.

(Taken at Adelaide.)

WEDNESDAY, 29th APRIL, 1925.

Present:

Mr. GREGORY, Chairman;

Senator Barnes | Mr. Blakeley  
Senator Reid | Mr. Cook.

Llewellyn Henry Griffiths, Telephone Manager, Adelaide, sworn and examined.

20. *To the Chairman.*—I am aware of the reference to the Committee of a proposal to establish an automatic telephone exchange at Wainhouse-street, Torrens-

ville, to serve the district of West Adelaide. The financial aspect of the proposal has been fully dealt with by the State engineer, and need not, it is considered, be repeated by me. The installation of an automatic exchange at Torrensville would, at the present time, have the effect of relieving existing exchanges, approximately, as follows:—Central, 1,128 lines; Glenelg, 34 lines; Unley, 12 lines; Henley Beach, 30 lines; waiting applicants, 26; a total of 1,230, which number is daily increasing. In many cases the subscribers in the district concerned are situated beyond the 2 miles radius of existing exchanges, and consequently are called upon to pay rental at the rate of 10s. for each quarter of a mile beyond the 2-miles radius of the exchanges to which they are at present connected. The installation of an auto exchange at Torrensville will largely avoid this feature; moreover, the automatic system lends itself to the introduction of satellite automatic exchanges working into main exchanges, and by this means it will from time to time be possible to install satellite exchanges at suitable centres throughout the network, thus obviating in a very large measure the necessity for subscribers whose premises are now situated beyond the 2-miles radius of existing exchanges being called upon to pay the increased mileage rental. The proposed exchange forms a most important link in the general scheme of automatics throughout the metropolitan network of Adelaide, the estimated composition of the network at date of the West Adelaide cut-over being as follows:—

Automatic Exchanges—

Prospect.  
Glenelg.  
Woodville.  
Brighton.  
Henley.  
Unley.  
Norwood.

Manual and Semi-auto Exchanges.

Central.  
Port Adelaide.  
Norton's Summit.  
Summertown.  
Stirling West.  
Blackwood.

The proposal provides for the installation of an initial equipment of 2,200 subscribers' lines, and an ultimate capacity of approximately 5,000 subscribers' lines. The West Adelaide district is a large and growing industrial and residential district, and the anticipated growth will, it is considered, be more than realized. The accompanying traffic, &c., statements were prepared by the Telephone Branch for the purpose of enabling the engineers to decide the class and quantity of equipment necessary in connexion with the West Adelaide proposal. The position regarding waiting applicants in the Adelaide metropolitan area is as follows:—

Central .. .. 100  
Prospect .. .. 100  
Norwood .. .. 120  
Unley .. .. 120

The position with regard to Unley is that the extension to the switchboard is now well in hand, and it is anticipated that all waiting applicants will be given service by the end of May. Extensions to the Norwood switchboard are also nearing completion, and it is anticipated that all waiting applicants in this district will

be given service by about the end of June. With regard to Central-30 of the waiting applicants are waiting for extension of underground cables. This work is in hand, and the position should be relieved within three months; the remaining applicants will be given service within three weeks. With regard to Prospect—we are waiting for additional switchboards; it is anticipated that these will shortly come to hand.

*Applicants in the West Adelaide Area.*—It is estimated that the present cable lay-out will approximately provide sufficient accommodation to connect all probable applicants in the West Adelaide area to Central up to the date by which it is anticipated that a local exchange can be established.

*Subscribers' Lines Connected to Exchanges in Metropolitan Area, Adelaide, as at 31st March, 1925.*

Central .. ..	8,440
Blackwood .. ..	150
Brighton .. ..	334
East .. ..	103
Norwood .. ..	1,775
Glenelg .. ..	322
Henley .. ..	461
Hyde .. ..	213
Unley .. ..	2,046
Port .. ..	980
Prospect .. ..	626
Semaphore .. ..	208
Stirling .. ..	313
Summertown .. ..	15
Woodville .. ..	349

16,930

It is estimated that, approximately, 32,800 subscribers will be connected to exchanges in the Adelaide network by 1931. The average revenue returned per metropolitan subscriber's line during 1923-24 financial year was £15.66. Paid local calls handled in South Australian telephone exchanges during the year ended 31st March, 1924, totalled—

Metropolitan exchanges ..	22,407,000
Country exchanges ..	2,880,000
Total ..	25,287,000

Corresponding figures for year ended 31st March, 1925, were—

Metropolitan exchanges ..	22,786,330
Country exchanges ..	3,222,048
Total ..	26,008,378

Percentage increase—

Metropolitan exchanges ..	1.7 per cent.
Country exchanges ..	11.9 per cent.
Whole State ..	2.8 per cent.

Including ineffective calls, it is estimated that approximately 29,550,000 local calls are handled annually in this State.

APPENDIX B.

WEST ADELAIDE EXCHANGE.

Exchange lines estimated to be connected—

At 1st January, 1928 .. ..	2,000
At 1st January, 1931 .. ..	2,700
At 1st January, 1940 .. ..	5,900

	Individual (Street) Lines.	P.B.X. Lines.	Number of P.B.X. Exchange Lines associated with any one service.		Party Lines (Two-party).	Public Telephone Lines.	Total Lines.
			Maximum.	Minimum.			
1.1.28 ..	1,881	69	6	1	20	30	2,000
1.1.31 ..	2,636	94	6	1	30	40	2,700
1.1.40 ..	5,547	183	10	1	80	90	5,900

	Number of P.B.X. Services having—		Total Lines.
	(a) Not more than Ten Exchange Lines connected.	(b) More than Ten Exchange Lines connected.	
1.1.28 ..	37	NH	
1.1.31 ..	48	NH	
1.1.40 ..	83	NH	

APPENDIX C.

CALLING RATES—WEST ADELAIDE EXCHANGE.

Summary of Traffic—

Effective, D.N.A. and wrong number calls ..	91.9 per cent.
Busy and ineffective, from other causes ..	8.1 per cent.

	Average Originating Traffic.		
	As at 1.1.28.	As at 1.1.31.	As at 1.1.40.
<b>Straight line—</b>			
Daily .. ..	3.42	4.23	5.6
Busy hour .. ..	.49	.94	.8
Ratio daily to busy hour ..	7:1	7:1	7:1
<b>P.B.X. line—</b>			
Daily .. ..	14.2	13.6	13.2
Busy hour .. ..	2.25	2.19	2.1
Ratio daily to busy hour ..	6:3:1	6:3:1	6:3:1
<b>Party line—</b>			
Daily .. ..	5.2	5.8	6.6
Busy hour .. ..	.7	.78	.89
Ratio daily to busy hour ..	7:4:1	7:4:1	7:4:1
<b>Public Telephones—</b>			
Daily .. ..	23.2	25.6	28.6
Busy hour .. ..	2.07	3.28	3.7
Ratio daily to busy hour ..	7:8:1	7:8:1	7:8:1

**TERMINATING TRAFFIC.**—The busy hour terminating traffic, per P.B.X. line, is 1.9. The balance of the terminating traffic may be considered as being proportionately divided among straight and party lines. Terminating traffic to public telephones is negligible.

APPENDIX D.

PARTICULARS OF HOLDING TIMES (IN SECONDS) OF TRAFFIC TO BE HANDLED AT WEST ADELAIDE EXCHANGE.

Item.	Local Calls.	Outgoing Calls.					Incoming Calls.			
		To other Exchanges.	To Manual Exchanges.	To Trunk Recording Desk.	To Information Desk.	To Complaint Desk.	To Testing Desk.	From other Exchanges.	From Manual Exchanges.	From Trunk Switch-board.
<b>Effective, D.N.A. and Wrong Number Calls.</b>										
(i) Removal of receiver or occupation of junction to completion of dialling ..	10	10	4	7	.7	7	7	10	10	10
(ii) Completion of dialling to replacement of receiver or release of junction after completion of call or call abandoned ..	163'8	187'4	208'5	71'3	95'6	99'2	97'0	186'	195'8	242'7
(iii) Replacement of receiver or release of junction to release of all apparatus ..	2	2	2	2	2	2	2	2	2	2
Holding times .. ..	176'8	199'4	214'5	80'3	104'0	108'2	106'0	198	207'8	254'7
<b>Busy Calls and Calls Ineffective from other Causes.</b>										
(i) Removal of receiver or occupation of junction to completion of dialling ..	10	10	4	..	..	..	..	10	10	10
(ii) Completion of dialling to replacement of receiver or release of junction after abandonment of call ..	16'7	25'2	43'4	..	..	..	..	25'8	32'4	33'0
(iii) Replacement of receiver or release of junction to release of all apparatus ..	2	2	2	..	..	..	..	2	2	2
Holding times .. ..	28'7	37'2	49'4	..	..	..	..	37'8	44'4	45'0
Average holding times for all classes of calls, based on proportionate number of each class of call ..										
	163'9	186'3	201'12	80'3	104'6	108'2	106'9	185	194'5	234

APPENDIX E.—SHEET No. 1.

BUSY HOUR DISTRIBUTION OF TRAFFIC BETWEEN THE WEST ADELAIDE EXCHANGE AND THE OTHER EXCHANGES OF THE NETWORK AS AT 1st JANUARY, 1928.

Exchange From—	Average Originating Traffic.																Lines Connected.				
	West Adelaide.	Henley Beach.	Central Adelaide.	Woodville.	Trunk Recording.	Norwood.	Stirling.	Summertown.	Northern Summit.	Prospect.	Unley.	Blackwood.	Glenelg.	Brighton.	Port Adelaide.	Semaphore.					
West Adelaide ..	298	38	614	24	18	70	12	1	24	70	6	18	6	69	24	1,180	8,210	59	4'1	6'06:1	2,000
Henley Beach ..	22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	450	3,210	64	4'8	7'13:1	698
Adelaide Central ..	338	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10,770	73,320	1'4	9'52	0'81:1	7,700
Woodville ..	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	410	2,815	63	4'33	0'86:1	650
Trunk Switch-board ..	40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,080	7,770	0'42	3	7'2:1	..
Norwood ..	80	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,680	18,830	65	4'57	7'03:1	4,120
Stirling ..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	205	1,435	62	3'66	7:1	392
Nornton ..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	65	54	3'9	6'5:1	18
Summertown ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	65	52	3'7	7'3:1	18
Prospect ..	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,050	7,350	0	4'2	7'13:1	1,750
Unley ..	84	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,810	20,475	62	4'55	7'29:1	4,500
Blackwood ..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	90	650	38	2'7	7'2:1	240
Glenelg ..	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	850	5,750	68	4'6	6'76:1	1,250
Brighton ..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	270	1,800	54	3'6	6'8:1	600
Port Adelaide ..	60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,970	12,615	1'6	10'5	6'56:1	1,230
Semaphore ..	18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	610	4,350	77	5'4	7'04:1	500

The figures above are average figures, and include effective and ineffective calls of all classes.

APPENDIX E.—SHEET No. 2.

BUSY HOUR DISTRIBUTION OF TRAFFIC BETWEEN THE WEST ADELAIDE EXCHANGE AND THE OTHER EXCHANGES OF THE NETWORK AS AT 1st JANUARY, 1931.

Exchange From—	West Adelaide.		Henley Beach.		Adelaide Central.		Woodville.		Trunk Switchboard.		Norwood.		Summertown.		Norton's Summit.		Prospect.		Unley.		Blackwood.		Brighton.		Port Adelaide.		Semaphore.		Totals for West Adelaide.		Totals for Central Group.		Totals for Unley Group.		Totals for Blackwood Group.		Totals for Brighton Group.		Totals for Port Adelaide Group.		Totals for Semaphore Group.		Totals for All Exchanges.	
	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.		
West Adelaide	378	57	806	45	30	135	22	2	2	38	130	0	54	14	03	40	1,890	13,220	7	479	7	1	2,700	890	1,810	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240

The figures above are average figures, and include effective and ineffective calls of all classes.

APPENDIX E.—SHEET No. 3.

BUSY HOUR DISTRIBUTION OF TRAFFIC BETWEEN THE WEST ADELAIDE EXCHANGE AND THE OTHER EXCHANGES OF THE NETWORK AS AT 1st JANUARY, 1946.

Exchange From—	West Adelaide.		Henley Beach.		Adelaide Central.		Woodville.		Trunk Switchboard.		Norwood.		Summertown.		Norton's Summit.		Prospect.		Unley.		Blackwood.		Brighton.		Port Adelaide.		Semaphore.		Totals for West Adelaide.		Totals for Central Group.		Totals for Unley Group.		Totals for Blackwood Group.		Totals for Brighton Group.		Totals for Port Adelaide Group.		Totals for Semaphore Group.		Totals for All Exchanges.		
	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	
West Adelaide	788	105	1,784	108	82	410	67	5	5	200	442	20	150	65	078	200	5,224	36,600	88	672	7	1	5,600	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580

The figures above are average figures, and include effective and ineffective calls of all classes.

APPENDIX E.—SHEET No. 4.

SPECIAL SERVICE TRAFFIC—WEST ADELAIDE EXCHANGE.

1st JANUARY, 1928.

Exchange.	Trunk reporting.				Information.				Complaint.				Testing.			
	Calls.		Ratio Day to Busy Hour.		Calls.		Ratio Day to Busy Hour.		Calls.		Ratio Day to Busy Hour.		Calls.		Ratio Day to Busy Hour.	
	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.
West Adelaide	18	130	7:2	1	30	205	6:8	1	15	102	6:8	1	14	101	7:2	1
1st JANUARY, 1931.																
West Adelaide	30	298	5:03	1	47	330	7:1	1	25	195	6:0	1	22	158	7:16	1
1st JANUARY, 1946.																
West Adelaide	82	576	7:1	1	130	915	7:1	1	65	458	7:1	1	60	430	7:17	1

ESTIMATED AVERAGE BUSY HOUR TRAFFIC (IN TRAFFIC UNITS) FOR THE PROPOSED WEST ADELAIDE AUTOMATIC EXCHANGE TWO YEARS AFTER DATE OF CUT-OVER.

Exchange From—	West Adelaide.		Trunk Switchboard.		Norwood.		Blackwood.		Brighton.		Port Adelaide.		Semaphore.		Totals for West Adelaide.		Totals for Central Group.		Totals for Unley Group.		Totals for Blackwood Group.		Totals for Brighton Group.		Totals for Port Adelaide Group.		Totals for Semaphore Group.		Totals for All Exchanges.		
	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	Busy Hour.	Day.	
West Adelaide	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12	11	12

\* A.—Automatic. M.—Magento Manual. S.A.—Semi-automatic.  
 † Traffic units—Calls made during specified period multiplied by average holding time (in hours) per call.



APPENDIX F—Sheet No. 2.  
ESTIMATED AVERAGE BUSY HOUR TRAFFIC (IN TRAFFIC UNITS) FOR THE PROPOSED WEST ADELAIDE AUTOMATIC EXCHANGE FIVE YEARS AFTER DATE OF CUT-OVER.

Exchange From—	West Adelaide	Itinerary	Complaints	Testing	Traffic to West Adelaide Group	Adelaide Central	Woodville	Trunk Switchboard	Trunk Switchboard	Information	Traffic to Central Group	Prospect	Unley	Blackwood	Traffic to Unley Group	Onions	Highgate	Traffic to Onions Group	Port Adelaide	Semaphore	Traffic to Port Adelaide Group			
West Adelaide	10,07	2,95	75	65	10,42	42,38	2,33	67	1,37	48,76	7	1,23	11	8,46	1,97	7	15	7,15	2,9	72	3,68	2,7	5,96	
Henley	1,8	4,42	18	17	9,97	15,67	1,33	21	2	17,31	1,71	1,71	4	2,23	64	1,71	23	1,94	1,44	64	2,08	1,01	5	1,80
Totals for West Adelaide Group	10,67	7,37	93	82	20,39	57,95	3,66	88	1,57	64,06	8,71	1,63	17	10,65	2,61	8,71	73	9,44	4,24	1,36	5,6	4,27	3,5	7,77
Adelaide Central	32,94	10	..	..	42,94	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Woodville	1,44	1,26	..	..	2,7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Central Group	34,38	11,26	..	..	45,64	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Trunk Switchboard	4,42	1,28	..	..	5,7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norwood	6,94	1,84	..	..	8,78	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Shirling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norton's Summit	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Norwood Group	7,58	2,16	..	..	9,69	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Prospect	3,08	79	..	..	3,87	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Unley	7,2	1,84	..	..	9,04	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blackwood	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Unley Group	7,03	1,95	..	..	9,58	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Glenside	1,9	705	..	..	2,85	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Brighton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Glenside Group	2,02	1,32	..	..	3,94	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Port Adelaide	4,47	2,21	..	..	6,68	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Semaphore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Port Adelaide	4,47	2,21	..	..	6,68	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Group	6,78	3,21	..	..	9,69	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

A.—Automatic. M.—Magneto Manual. S.A.—Semi-automatic.

\* Traffic Units—Calls made during specified period multiplied by average holding time (in hours) per call.

APPENDIX F—Sheet No. 3.  
ESTIMATED AVERAGE BUSY HOUR TRAFFIC (IN TRAFFIC UNITS) FOR THE PROPOSED WEST ADELAIDE AUTOMATIC EXCHANGE TWENTY YEARS AFTER DATE OF CUT-OVER.

Exchange From—	West Adelaide	Itinerary	Complaints	Testing	Traffic to West Adelaide Group	Adelaide Central	Woodville	Trunk Switchboard	Trunk Switchboard	Information	Traffic to Central Group	Prospect	Unley	Blackwood	Traffic to Unley Group	Onions	Highgate	Traffic to Onions Group	Port Adelaide	Semaphore	Traffic to Port Adelaide Group			
West Adelaide	30,05	10,06	1,95	1,78	43,87	85,69	5,03	1,83	3,78	50,70	20,97	2,95	26	24,44	13,45	22,87	3,35	24,22	8,07	3,35	11,43	20,91	13,45	43,26
Henley	6,17	7,88	39	38	14,75	28,64	3,47	45	48	33,01	3,47	1,12	16	4,91	3,47	3,47	3,47	3,47	3,47	3,47	3,47	3,47	3,47	7,04
Totals for West Adelaide Group	30,22	17,94	2,31	2,13	69,6	114,23	9,06	2,25	4,25	83,71	24,44	4,07	42	29,35	16,92	26,34	6,82	27,69	11,54	6,82	14,90	24,38	16,92	50,4
Adelaide Central	89,83	27,67	..	..	117,5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Woodville	8,07	5	..	..	13,07	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Central Group	97,9	32,67	..	..	130,57	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Trunk Switchboard	11,83	2,57	..	..	14,4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norwood	17,00	5,68	..	..	22,58	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Shirling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norton's Summit	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Norwood Group	18,29	5,68	..	..	24,28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Prospect	14,56	3,47	..	..	18,12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Unley	20,35	5,78	..	..	26,14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blackwood	77	32	..	..	1,09	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Unley Group	21,12	6,11	..	..	27,23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Glenside	7,71	2,37	..	..	10,08	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Brighton	2,47	2,1	..	..	4,57	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Glenside Group	10,18	4,47	..	..	14,65	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Port Adelaide	13,68	4,9	..	..	18,76	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Semaphore	11,83	2,68	..	..	14,46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals for Port Adelaide	25,7	7,53	..	..	33,22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

\* Traffic Units—Calls made during specified period multiplied by average holding time (in hours) per call.  
All exchange will be automatic at full date.

In so far as the traffic is concerned, I am in full control of the telephonic services. We merely draw attention of the engineers to the necessity for new equipment or new exchanges, and state the approximate situation. A development study is then made, and a telephone centre decided upon. We do not necessarily make the recommendation as to the type of exchange or the system to be employed. If manual equipment is decided upon, we are consulted as to the class of manual equipment necessary to carry the traffic. There is, and there must be, the fullest collaboration between the two branches. If there were a difference of opinion as to whether the manual or the automatic should be installed, Central Office would decide the matter. It is my opinion that the new automatic exchanges have been placed at the most suitable points, having in view the best interests of the subscribers generally, particularly in view of the fact that the satellite principle can be introduced at any time. It may in some cases be cheaper to reduce the cost to subscribers beyond the 2-mile limit rather than to have satellite exchanges, that would depend upon the density of the area and the anticipated telephone development. After a study of the economies of the case, we could if necessary recommend that those subscribers be supplied at the same rate as they would be if they were living within the 2-mile radius, rather than to incur the greater cost of establishing satellite exchanges. Such a recommendation has been made in certain cases. One that I can cite is Mollbury, where there is no exchange established. We decided upon a telephone centre there, but there is no immediate prospect of establishing a satellite exchange, because Prospect is not at present equipped as full automatic exchange. It has been decided for the time being to treat the applicants for service as though they were connected to the theoretical telephone centre, but connect them to the Prospect Exchange. The delay that has taken place in connexion with the automatic exchanges has been caused by the difficulties that we have experienced in obtaining the necessary equipment. This matter, however, does not concern this province. The authority for the erection of the buildings comes from Central Office. It was anticipated at the time that the buildings were started, however, that we would be able to get the equipment within a reasonable time. Tenders have been accepted for certain exchanges, and I should say that immediately approval is given to incur the expenditure on the West Adelaide scheme tenders will be immediately invited. The probability is that it will now be most easy to get suitable tenders and prompter delivery than has been the case in the past. As a general rule, I think that the plant should be ready four or six months after the erection of the building, but it is not always possible to arrange the matter in that way. If the conditions of tenders could be definitely standardized, it would be possible to have the matter arranged on a more exact basis, but they vary according to the requirements in each case. The building at Prospect has been completed about five or six months. Tenders for the supply of the plant have been accepted, and it is supposed to arrive here by January or February next, and it should be in operation early in 1927. At present, only the garage and some of the lunch-rooms at Prospect are being utilized. There is a small manual exchange situated within the garage, with about 635 subscribers connected, and there are about 120 applicants waiting. I think that the average revenue of £15.66 per subscriber is larger than it is in other States. As a rule, our figures are compiled from the Accountant's records and the Postmaster-General's annual report. Generally speaking, public opinion regarding the manual system at Central is very favourable, and the service is looked upon as being very satisfactory. I have not had experience with the automatic system. I have seen the automatic working in Melbourne and Sydney, but I do not know whether it has given entire satisfaction. The question of which system would be to the greatest advantage to

the public and the most economical would depend largely upon the size of the network. Where it is anticipated that there will be 80,000 subscribers in a network in five or six years' time, I should certainly recommend the automatic system. Where you have a large number of exchanges, the cost of sending calls backwards and forwards over junction lines becomes rather prohibitive. If the Adelaide district were as large as Sydney, the automatic system would be preferable. Under it, the cost would be approximately from 5 per cent. to 10 per cent. cheaper than under the manual system. There appears to be a very great difference in the capital cost of the manual and the automatic. I do not know what is the present day cost, because I have not recently seen a quotation for manual equipment in a large way. Various classes of manual equipment can be purchased. It is claimed for the most modern that a girl can handle 400 traffic units an hour compared with 225 on the present standard No. 1 C.B. switchboards. I have not seen that class of switchboard, and I am doubtful whether such loads could be handled hour after hour throughout the day. In the United States of America to-day I think the industry is towards the automatic system. In New York and San Francisco, the manual system is very largely retained, but whenever they are compelled to pull out an exchange and scrap it, they replace it with the automatic system.

21. To Senator Barnes.—I am unable to say how much of the estimated cost of £20,415 will be absorbed in labour. That is purely an engineering matter, the details of which are worked out in Central Office.

22. To Senator Reid.—When the Traffic Branch reports the necessity for a new exchange, the Engineering Department takes the matter up, decides upon the type of building, and makes out the financial statement. That is submitted to Central Office, where it is finalized. That office also decides the date the building should be available.

23. To Mr. Cook.—There is a shortage of telephone materials throughout the world. The position is apparently just as acute in America and England as it is in Australia. There are no local firms with equipment suitable for the manufacture of these plants. I understand that a prominent English electrical firm some time ago purchased a site in Sydney with the intention of building a large factory for the manufacture of telephone switchboards, cables, and other things, but they do not appear to have done anything further. There is no immediate likelihood of getting over the shortage by local manufacture.

24. To the Chairman.—The estimates are prepared by the accountant. He would probably abstract from his card system the number of subscribers residing in the West Adelaide district. He would compute the revenue from those subscribers, and apply that figure to the anticipated development. We should not necessarily be consulted about the figures before they are submitted to head office. On the financial aspect there is collaboration between the accountant and the electrical engineer. They would consult us if considered necessary to ascertain whether the average would be likely to keep up with the anticipated future development. The engineering staff make the development study, and decide upon the economies of any proposed system. I think the present practice is quite satisfactory. There is a possibility that, in the near future, the developmental work will be handed over to the telephone manager. There has been no canvass of subscribers in this State. During the war period and since we have experienced a shortage of material, and we have not been able to meet the requirements of those who came in voluntarily. Sometimes a body of producers or country people will ask for a man to be sent to their district to explain the system to them, work out the rentals on the spot, and decide whether a telephone exchange can be installed at any given centre. When we are in the

position that we can meet all demands, it will be a good thing to have a canvass of the State made with the object of increasing the number of subscribers. A general feature of telephone systems throughout the world, particularly with the manual system, is that the average cost increases as the service becomes bigger. That is due in a large measure to the increase in the size of the multiple. The same principle applies to a certain extent with the automatic system. It would be a difficult matter to make the definite statement that with 30,000 subscribers we should be losing so much, with 40,000 so much more, and with 50,000 so much more; it depends largely upon the manner in which you arrange the network, the cost of the junction lines, and the class of equipment installed. The question of whether charges will have to be increased depends upon whether the plant and maintenance cost is to be any greater than it is now, or will come down. I should say that we have reached the highest prices for automatic equipment. At present the junction factor is one that largely governs the matter.

You have in a local exchange a certain number of subscribers able to call each other as individuals among a group, but when such calls have to be transferred from, say, West Adelaide to Glenelg, Henley, Central or Semaphore, you are using a huge amount of extra plant from which you are getting no greater return than you would from a local call. A margin of profit has for years been shown at exchanges throughout this State after payment of interest and working costs, and allowing for depreciation. I do not say that we will show a margin of loss when all the automatics are installed. The introduction of the automatics generally may not lead to increased costs; that is for the future to decide, and it is governed largely by cost of plant and skilled labour, awards of Arbitration Courts, and the number of staff that will have to be employed. The Arbitration Court will probably affect us less under the automatic system than under the manual system; we shall be able to reduce our operating costs, whilst the mechanical staff costs may be slightly increased. We are at present preparing data for the conversion of the central exchange to full automatic. When the conversion to automatic is completed the staff will be absorbed elsewhere. We are already watching that matter very carefully, and we anticipate that we shall be able to place in the country, or in the trunk exchange, the majority of the girls whose services would otherwise be dispensed with. Our trunking system is increasing enormously, and by the time we get Central to full automatic working, we shall require a large staff for trunk work only. At the present time, it would be difficult to say whether the country development is a profitable one. A lot of the work is necessarily of a pioneering nature. There is no doubt of the future of the trunking system.

(Taken at Adelaide.)

THURSDAY, 30th APRIL, 1925.

(SECTIONAL COMMITTEE.)

Present:

Mr. GREGORY, Chairman;

Senator Baines | Mr. Blakeley.

Senator Reid

Charles Herbert Uitley Todd, Commonwealth Works Director for South Australia, sworn and examined.

25. To the Chairman.—In the preparation of plans for an exchange of this character we are generally included to confer with the local Deputy Postmaster-General to ascertain the floor space that is required for the housing of the equipment. On that information we base our temporary sketch plans for the chief architect's consideration. I think that each State outlines

its building requirements; I do not know that there is any standard size for exchange plant. I do not think it possible that a building would be asked for which would be either larger or smaller than buildings erected in the other States for the housing of the same amount of equipment, because the same official in the Central Office deals with all the States. There is, therefore, the fullest collaboration in order to ensure that a building no greater in size than is required will be provided. I collaborate very closely with the Department here in the preparation of plans. The site for this exchange is an eminently suitable one in every way. The foundations in Adelaide are not good. In this case we have the usual Adelaide foundation, and the necessary provision will be made for reinforcing it, in order to ensure that, when erected, the building will be a satisfactory one. In all buildings in Adelaide the foundations are reinforced concrete. Our estimates have been made up with a certain amount of detail. It is estimated that the building will cost £7,000, which works out at about 24s. per super. foot. That does not include the outbuildings; it applies only to the exchange building itself. No comparison is made between the cost in Adelaide and in the other States. The conditions here are different from those in the other States. There are different building awards, sometimes different hours of labour, and a different output from the workmen. We obtain a fair output from our workmen here. Both in quantity and quality, the Adelaide work compares favourably with any in the eastern States. We work on South Australian conditions, and make our comparisons with other buildings of a similar nature that are erected in South Australia. When a building of this character is erected in a residential area, the endeavour is to make it as architecturally pleasing to the eye as possible. The price of bricks in the city is 5s 1s if you have the run of the kiln, and 5s 9s for assorted qualities. I think that those prices are very similar to the prices ruling in Sydney and Melbourne, but are a little dearer than in Western Australia. All our reinforcement work is built up on the building. It would not be possible for inferior work to be placed there. We are particular to see that an inspector is on hand when any reinforcement work is being done. This building comprises a switch-room, the dimensions of which are 91 feet by 40 feet. Associated with that is a battery-room, 32 x 22 feet, with lavatory and stores adjacent, also a small staff room, with conveniences for boiling water and a sink for washing up, and an air-conditioning plant-room, 23 feet x 17 ft. 0 in., with a boiler-room 5 feet wide off it. The construction is of brick, with cement dressings. The foundations are reinforced. The height of the switch-room from the bottom of the floor to the top of the ceiling is 16 ft. 6 in. In the switch-room there is a reinforced concrete ceiling for fire protection, which I believe has been introduced to meet this Committee's wish. The treatment, whilst plain, is architecturally pleasing, with sufficient dignity to at any rate not depreciate the credit of the Government that is erecting it. The floor of the switch-room is of concrete. The roof over the battery-room, staff room, and air-conditioning plant room is of reinforced concrete, and is comparatively flat. The main switch-room has a timber-framed roof, covered with local Willunga slates, it being thought likely, after consideration, that with those there would be less deterioration, and that they would make the room cool—which, which, I understand, is essential for the plant. The slates are of good quality, and although they are dearer than iron, they are obtained at a lower price than is asked for the imported slates. Their first cost is about twice as great as that of galvanized iron, and they are, perhaps, 10 per cent. dearer than tiles. I personally prefer the slates, as with them there is not so much danger of breakage as there is with tiles, and I think that they are likely to have a longer life. My instructions are to use slates in this State—due, I believe, to representations having been made by the State quarries that we

should use local material wherever possible. Iron would make a suitable roof, but slate makes a better one. The use of iron would make a difference in the cost of £200. With it we could use a lighter wood framing. I should like you to hear evidence from the chief architect as to the desirability of making a change from the flat concrete roof in those portions of the building that are not devoted to the housing of the plant.

Mr. Murdoch generally has good reasons for any of the instructions he issues. The fire risk would be greatly increased if you departed from the concrete roof. There is practically no fire risk with the present type of construction; but with an iron roof, if a fire occurred, the heat would quickly ignite the timber framing underneath. All our buildings are under the control of the Metropolitan Fire Brigade for advice as to combating fire, and each new building is inspected by the superintendent, whose advice and instructions are promptly followed. The iron ladder which runs up to the roof is a great convenience for the public. I really question the necessity for it, but it is provided at the request of the Postmaster-General's Department, whose officers want to get to their leading-in cables easily. In accordance with the wish of the Committee, a double set of doors is provided at the entrance, to exclude dust from the switch-room. The door at the side is to be utilized for taking material into the switch-room. Fire-resisting glass over the windows will not be necessary. We have made provision for small panes with steel window frames. Sewerage has been provided for. I do not think that the location of the lockers alongside the boiler will be a detriment. The boiler will be used only for purposes of heating in the cold weather.

26. *To Mr. Blakeley.*—We do not run the boiler in the hot weather in Adelaide. Air washing is done by an ammonia process with electrical power. In the summer time the air cannot be reduced below the temperature that is required; and it is not necessary, therefore, to reheat it. Central Exchange has an air-conditioning plant, but does not use the boiler during the summer. For only about one-third of the year is the air-conditioning plant fully used; for the remainder of the period natural conditions obtain. There is practically no fire risk in this building. If it would meet the requirements of the Postal Department, and the chief architect has no reason to advance against it, I should say that we could have a galvanized-iron roof over all portions, except the battery-room, and perhaps the boiler-room. Iron will not stand against acid; when it is used it is necessary to treat specially the floor, ceiling, and walls. If a change is made from the concrete ceiling, we propose to put in a fibrous-plaster ceiling.

27. *To Senator Reid.*—It is not necessary to have a slate roof with parapet walls up the side of the building, but it is desirable. Corrugated iron has about one-quarter the life of slate; it would last about fifteen years, compared with 60 years in the case of the slate, when it is in close proximity to the sea. In Brisbane and Sydney, some iron roofs last only seven or eight years. I do not think that the slate roof adds one particle to the removal of fire risk. Very careful consideration was given to the question whether we should introduce slate roofs in South Australia before we received instructions to do so. The matter was considered on a commercial as well as on a sentimental basis. I think it will be found that a change will be made to a canopy at front.

28. *To the Chairman.*—The canopy will appear in the front and the main side, but not on the other side, where we have the lean-to. As soon as we receive instructions to go ahead with these buildings, we have to do so. It is quite nine months since the first of the new automatic telephone exchange buildings was completed. In that time we have completed the five exchanges that have been approved. They are still unoccupied. The extensions of existing exchanges at

Unley and Norwood are proceeding, and I believe that they have their equipment ready for installing. From the time of receiving instructions, preparing specifications, and calling for tenders, the building at Prospect took about ten months to erect. That, however, is hardly a fair criterion of the time that is likely to be occupied in construction. We had a serious flood in the middle of the year, and the brickyard was washed away. We were held up for six or eight weeks waiting for bricks. We could complete this building at West Adelaide in nine months from the day we received instructions to go ahead with the work. Our experience has proved that, if you push past a certain rate of progress in Adelaide, you pay more for your work. There is only a limited number of tradesmen available for the whole of the building work in Adelaide. If building is slack, we can obtain a greater number of tenders, and construction is completed in a shorter period. If the builders are fairly busy, they will not submit a tender if the time is cut to the bone. We are really building more economically by devoting a greater time to our construction. If you were to make inquiries in the other States, I think you would find that they have found it necessary to lengthen the time allowed.

29. *To Mr. Blakeley.*—Apart from timber framing, but inclusive of fixing them in position. Willunga slates cost just under £1 a square yard. Tiles cost about 17s. or 18s. Of course, it must be understood that there is a great deal more maintenance necessary with a tile than with a slate roof.

(Taken at Melbourne.)

FRIDAY, 1st MAY, 1925.

Present:

Mr. GABOON, Chairman;

Senator Barnes  
Senator Reid  
Mr. Blakeley

Mr. Cook  
Mr. Mathews.

John Smith Murdoch, Chief Architect, Department of Works and Railways, sworn and examined.

30. *To the Chairman.*—I understand that Mr. Todd suggested that a saving of about £200 could be effected in the roofing of the West Adelaide Telephone Exchange by using small slated galvanized iron for ceilings, and an iron roof instead of the usual type of concrete, but I would like to go into the figures before I expressed an opinion as to what saving could be effected. The circumstances at West Adelaide are not on all fours with those at Lakemba. At West Adelaide, it would mean that you would have to introduce three steel beams, two crossing the battery room, and one crossing the air-conditioning room. The span of 22 feet is rather too large for a timber joist, in my opinion. It would require a joist about 16 x 2 and that is a pretty expensive piece of timber. If steel joists are used with a roof, such as Mr. Todd has suggested, I do not know that there would be so much saving. I will let the Committee have my figures a little later this afternoon. I do not think that the Prospect building was successful in every particular. In regard to the West Adelaide building, a cornice is provided on both sides of the building, but not in the front. I quite realize that it would add to the appearance if the cornice were in the front. I will look into the plan, and I think we will be able to arrange that very easily. A slate roof is being put on the building, and probably the cost will be about £200 more than a galvanized iron roof. A sort of promise was given to Mr. Dunstan; over there, that a couple of telephone exchanges would be done in slate, but whether we can continue using slate when the cost is so much more than iron is a question that we will have to go into. It has happened in a number of cases that buildings have been

ready for automatic telephone equipment before the equipment has arrived, but I think the Post Office has always acted in good faith when it has told us the date on which it expects to receive its material. Sometimes, of course, on the other hand, our buildings have not been ready by the time we have stated. That has been due usually to the necessity for making some change in the specifications or plans. I have no doubt that one reason why the equipment is not available as early as the Post Office expect it, in some cases, is that there has been such a great demand for automatic telephone equipment. It is undeniable, however, that there have been occasions when buildings have been ready quite a long time before the equipment has been available. The Prospect case is a particularly bad one from that point of view. On the other hand, the equipment will be available for the Albion (Brisbane) exchange before our building is ready. The building there was delayed three months on account of wet weather, but we are doing our best to push the work on as fast as possible.

The Post Office people are in close touch with us to obviate, as far as possible, any delays, and also to prevent, where it can be done, buildings being ready a long time before the equipment is ready.

31. *To Senator Reid.*—I think there might be improvement in respect to our Department and the Post Office working together to get the buildings ready at the right time on our part, and on their completed. The Post Office, I think, are possibly able to handle automatic equipment now better than they did earlier. They are getting to know more about it. There is complete co-operation between the Post Office officials and ourselves in respect to the building of these exchanges. I am in daily association with their engineers. We practically look on ourselves as belonging to the same Department. From the Post Office side, the engineers are very earnest about this work.

The witness withdrew.  
The Committee adjourned.