

1927.



THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA. *Brought up by Senator Reid*

Pursuant to Statute

By Command

In return to Order

PARLIAMENTARY STANDING COMMITTEE *of the Senate*  
ON PUBLIC WORKS. *16<sup>th</sup> Nov. 1927*

## REPORT

TOGETHER WITH

### MINUTES OF EVIDENCE

RELATING TO THE PROPOSED ESTABLISHMENT OF AN

## AUTOMATIC TELEPHONE EXCHANGE

AT

BOX HILL, VICTORIA.

*In Authority:*

H. J. GREEN, GOVERNMENT PRINTER, CANBERRA.

# MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

(Fifth Committee.)

GEORGE HUGH MACKAY, Esq., M.P., Chairman.

Senate.

Senator John Barnes.  
Senator Patrick Joseph Lynch.\*  
Senator Herbert James Mockford Payne.†  
Senator Matthew Reid.

House of Representatives.

Malcolm Duncan Cameron, Esq., M.P.‡  
Robert Cook, Esq., M.P.  
The Honorable Henry Gregory, M.P.†  
Andrew William Lacey, Esq., M.P.  
David Charles McGrath, Esq., M.P.  
Alfred Charles Senbrook, Esq., M.P.

\* Resigned 30th June, 1928. † Appointed 1st July, 1928. ‡ Resigned 2nd March, 1927. § Appointed 24th March, 1927.

## INDEX.

	Page
Report .. .. .	3
Minutes of Evidence .. .. .	5

## EXTRACT FROM THE MINUTES OF THE EXECUTIVE COUNCIL—No. 77, DATED 24th JUNE, 1927.

Postmaster-General's Department,  
24th June, 1927.

Departmental No. 77.

MINUTE PAPER FOR THE EXECUTIVE COUNCIL.

Executive Council

Subject:

No. 34.

### PROPOSAL FOR THE ESTABLISHMENT OF AN AUTOMATIC TELEPHONE EXCHANGE AT BOX HILL, VICTORIA.

Approved in Council.

I recommend for the approval of His Excellency the Governor-General in Council that in accordance with the *Commonwealth Public Works Committee Act 1913-1921* the (Sgd.) J. G. LATHAM, undermentioned work be referred to the Parliamentary Standing Committee on Public for Governor-General. Works for investigation and report thereon to the House of Representatives, viz.:—

Box Hill, Victoria; establishment of an automatic telephone exchange.

6th July, 1927.

Filed in the Records of the Council

(Sgd.) J. H. STANLING,  
Secretary to the Executive Council.  
7th July, 1927.

(Signed) W. G. GIBSON,  
Postmaster-General.

## LIST OF WITNESSES.

	Page
Crawford, John Murray, Chief Engineer, Postmaster-General's Department .. .. .	5
Fanning, Lawrence Bede, Chief Inspector of Telephones, Postmaster-General's Department .. .. .	7
Fleming, James, Chief Mechanical Engineer, Department of Works and Railways .. .. .	11
Murdoch, John Smith, Director-General of Works, and Chief Architect, Department of Works and Railways .. .. .	9
Partington, Reginald Nyren, State Engineer, Postmaster-General's Department, Victoria .. .. .	7

## BOX HILL 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 Box Hill, Victoria, has the honour to report as follows:—

### INTRODUCTION.

1. On the 7th December, 1921, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report, a proposal to install an automatic telephone exchange at Box Hill, Victoria, as from the 1st January, 1924, at an estimated cost of £44,841.

2. There were on the 31st December, 1921, 567 telephone subscribers connected to the Box Hill Exchange.

The Committee, after taking evidence in the matter came to the conclusion that there was no necessity at that time to incur the expenditure of £44,841 proposed, and were satisfied that by the expenditure of a sum of £2,720 on the existing building and equipment, a satisfactory service could be rendered to the small number of subscribers connected, until 1st January, 1929.

A report to this effect was made to Parliament on the 3rd October, 1922.

### PRESENT PROPOSAL.

3. The present proposal aims at the erection of a building at the rear of the existing telephone exchange site at the corner of Whitehorse-road and Station-street, Box Hill, and the installation therein, as from the 31st December, 1928, of an automatic telephone switching system having an initial equipment for 1,700 subscribers' lines, and an ultimate capacity of approximately 5,200 subscribers' lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named and thus enable requirements in the proposed automatic exchange area to be met for twenty years after the suggested date of opening.

### REASONS FOR THE PROPOSAL.

4. It is represented that the existing manual magneto telephone exchange will reach the limit of its capacity by about 1928, and, owing to building limitations, cannot be extended in the present structure. It is stated that the district is a progressive one, and to give to present and prospective subscribers the efficient service to which they are entitled, it will be necessary to install modern plant in a new building.

### ESTIMATED COST.

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

	£
Site (already acquired) .. .. .	241
Building .. .. .	6,000
Air-conditioning plant, &c. .. .. .	3,750
Exchange equipment, including that necessary at other exchanges .. .. .	30,075
Sub-station equipment .. .. .	6,291
Line plant (diversion) .. .. .	180
Sundries .. .. .	448
	<hr/>
	£46,985

## COMMITTEE'S INVESTIGATIONS.

6. The Committee visited Box Hill and inspected the existing manual exchange and the site suggested for the new automatic installation, and traversed portion of the district 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.

7. The proposed site is situated at the corner of Whitehorse-road and Station-street, and forms portion of the postal property having a frontage of 60 feet to Whitehorse-road by a depth of 160 feet along Station-street. The intention is to erect the new exchange building at the rear of the post office. It will face Station-street, and extend to the limit of the site north-wards where it will abut on a right-of-way opening into Station-street. The area is reported to be a good building site although there is a fall of about 8 feet toward the north end of the block. To make the best use of this condition, it is proposed to keep certain of the rooms below the floor level of the switch-room.

## BUILDING.

8. The building suggested has been planned to suit the site, and conforms with the requirements of the Postmaster-General's Department. The design is for a fire-resisting structure which will comprise, on the ground floor, a switch room 77 ft. 6 in. by 36 ft.; a luncheon-room 17 ft. by 15 ft.; a store-room 10 feet by 7 feet and the necessary lavatory accommodation. Below portion of the building will be the basement floor, which will contain the cable-well for bringing in the cables from Station-street; a power-room 18 ft. 2 in. by 22 ft. 5 in.; a battery-room 25 ft. 5 in. by 18 ft. 4 in.; a line inspector's room 11 feet by 22 ft. 5 in.; an air-conditioning room 26 ft. 9 in. by 14 ft. 9 in., and a space for fuel and boilers. In addition there will be two small rooms 9 ft. 6 in. by 6 ft. 5 in., and 4 ft. 6 in. by 10 ft. 6 in. The height of the switch-room will be 14 feet, and of the rooms on the basement floor 10 feet. The construction will be of brick, with concrete floors. The ceiling of the switch-room will be of concrete, covered by an iron roof set behind parapets.

10. It is proposed that the exchange building shall be on the alignment of Station-street on the one side, and shall be kept back from the boundary of the adjoining property about 21 feet for portion of the distance and 6 feet for the remainder of the distance. When the exchange is built there will be a space between it and the existing post office of about 14 feet.

11. After carefully examining the plans and hearing the evidence of the Director-General of Works and Chief Architect, the Committee is satisfied that the structure has been designed with due regard for economy, and will be quite suitable for the purpose for which it is intended.

12. In the course of its investigations the Committee learned that the lavatory accommodation at present provided for the postal staff will be removed and the space occupied by portion of the new building. It is therefore recommended that adequate accommodation in this direction be provided to meet the requirements of both the post office and telephone exchange staff.

## FINANCIAL ASPECT.

13. 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., 31st December, 1928, are estimated at £12,775, and five years later at £17,312. The estimated revenue at 31st December, 1928, is set down at £13,953, and five years later at £20,930. The assets thrown spare if the automatic system is installed on 31st December, 1928, are estimated to have a recoverable value of £5,421.

## COMMITTEE'S RECOMMENDATION.

14. After due consideration the Committee unanimously agreed to recommend that the proposal for the installation of an automatic telephone exchange at Box Hill, Victoria, as submitted, be proceeded with.

*C. H. Mackay*  
G. H. MACKAY,  
Chairman.

Office of the Parliamentary Standing Committee on Public Works,  
Parliament House,  
Canberra, 12th October, 1927.

# MINUTES OF EVIDENCE.

(Taken at Melbourne.)

SATURDAY, 17th SEPTEMBER, 1927.

Present:

Mr. MACKAY, Chairman;

Senator Barnes

Mr. Cook

Senator Reid

Mr. McGrath.

Mr. M. D. Cameron

John Murray Crawford, Chief Engineer, P.M.G.'s Department, sworn and examined.

1. To the Chairman.—I am responsible for the proposal for the erection of an automatic telephone exchange at Box Hill. I regard it as a matter of urgency. I have prepared the following statement relating to it:—

PROPOSAL FOR ESTABLISHING AN AUTOMATIC TELEPHONE EXCHANGE AT BOX HILL, VICTORIA.

The proposal is to erect a building at the rear of the existing telephone exchange site at the corner of Whitehorse-road and Station-street, Box Hill, and install therein an automatic telephone switching system having an initial equipment for 1,700 subscribers' lines, and an ultimate capacity of approximately 5,200 subscribers' lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named and thus enable requirements in the proposed automatic exchange area to be met for twenty years after the proposed date of opening.

## REASONS FOR THE PROPOSAL.

The existing manual magneto telephone exchange will reach the limit of its capacity by about 1928, and owing to building limitations cannot be extended in the existing building. It is proposed, therefore, to install modern plant in a new building in order to give efficient service to the existing and prospective subscribers in the area.

## ESTIMATED COST.

The estimated immediate cost of the work is:—

	£
Site (already acquired) .. .. .	241
Building .. .. .	6,000
Air-conditioning Plant, &c. .. .. .	3,750
Exchange Equipment, including that necessary at other exchanges .. .. .	39,075
Sub-station Equipment .. .. .	6,201
Line Plant (Diversion) .. .. .	180
Sundries .. .. .	448
	<b>£40,985</b>

## ACTUAL AND ESTIMATED REVENUE.

The actual revenue for the year ended 31st December, 1926, and the annual revenue it is estimated will be obtained on the date of opening and five years thereafter is shown hereunder:—

Average number of Subscribers Lines connected during the year ended 31st Decem-ber, 1926.	Actual Total Revenue received for year ended 31st Decem-ber, 1926.	Estimated number of Subscribers Lines, 31st Decem-ber, 1928 (date of opening).	Estimated Annual Revenue, 31st Decem-ber, 1928.	Estimated number of Subscribers Lines, 31st Decem-ber, 1933 (five-year date).	Estimated Annual Revenue, 31st Decem-ber, 1933.
1,068	£10,644	1,490	£13,953	2,160	£20,930

## SITE.

The proposed site is situated at the corner of Whitehorse-road and Station-street, and has a frontage of 60 feet to Whitehorse-road, and a depth of 160 feet along Station-street. It is proposed to erect the automatic telephone exchange building at the rear of the postal building which is located at the Whitehorse-road frontage and leases the existing manual telephone exchange.

## BUILDING.

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 1,700 subscribers' lines, but the building will be designed to accommodate equipment having a capacity of approximately 5,200 subscribers' lines.

## FINANCIAL ASPECT.

Item.	As at 31.12.28.	As at 31.12.33.
1. Capital Cost—New .. .. .	£ 40,985	£ 87,836
2. Capital Cost—New and in situ .. .. .	90,357	137,188
3. Annual Working Expenses of proposed Automatic Exchange .. .. .	4,352	5,955
4. Total Annual Charges for proposed Automatic Exchange .. .. .	12,775	17,312
5. Annual Revenue— Actual for the year ended 31.12.26, £10,644 Estimated as at 31.12.28 .. .. .	13,953	20,930
6. Assets recoverable or thrown spare if an automatic exchange is established on new site on 31.12.28— (i) Book value .. .. .	12,526	
(ii) Recoverable value .. .. .	5,421	
(iii) Cost of recovery .. .. .	328	

Regarding item 6 of the foregoing statement, the difference between sub-item (i) and (ii), namely, £7,105, 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 assets which is irrecoverable, and includes depreciation due to wear and tear and labour in installation.

I also submit the following certificate from the accountants as to the revenue figures I have quoted:—

## POSTMASTER-GENERAL'S DEPARTMENT—VICTORIA.

### Revenue—Proposed Automatic Telephone Exchange—Box Hill.

(a) Actual total revenue received from the subscribers in the existing Box Hill Telephone Exchange area for the twelve months ended 31st December, 1926:—

	£	s.	d.
Rents .. .. .	6,100	10	7
Calls .. .. .	3,953	8	5
Miscellaneous Charges .. .. .	119	0	0
Trunk Line Calls .. .. .	470	15	0
Totals .. .. .	<b>£10,643</b>	<b>14</b>	<b>0</b>

Average number of lines connected during the above-mentioned months, 1,068.

Average revenue per line, 9s. 10s. 4d.

(b) Estimated annual revenue for the proposed Box Hill Automatic Telephone Exchange area as at the proposed date of cut-over, i.e., 31st December, 1928, and five years later.

	No. of Lines.	Rents.	Calls.	Miscellaneous Charges.	Trunk Line Calls.	Total.
As at date of Cut-over .. .. .	1,400	8,009	5,187	157	630	13,953
Five years later .. .. .	2,100	12,014	7,735	238	945	20,930

I hereby certify that the above figures have been computed from the books and records of this office, and the figures with respect to the revenue are to the best of my knowledge and belief correct.

W. JEFFRY,  
Acting Accountant.

Postmaster-General's Department,  
Melbourne, 19th March, 1927.

The cost of the site has been apportioned. The figure I have quoted is not the total cost. The estimate of the cost of the air-conditioning plant was supplied by the Works and Railways Department. I cannot explain the reason for the extra cost as compared with the cost of other exchanges. The reason for the difference in the cost of equipment at Cottesloe and Box Hill is that the calling rate is higher at Cottesloe. Our T.U. (Transition Units) figures at Box Hill is .017, and at Cottesloe .024. "T.U." represents the product of the number of calls and the time the line is held. If a subscriber holds a line longer at Cottesloe than at Box Hill, the T.U. is greater. There is not much difference between the figure for one suburban exchange and that for another. The automatic exchanges in the metropolitan area of Melbourne are—Asot, Carlton, Collingwood, Malvern, Brighton, and Sandringham. Very shortly there will be added Elsternwick, Northcote, South Melbourne, and Canterbury. The last two will be opened within the next month, but the other two will take the best part of twelve months to complete. We have other exchanges in contemplation. The exchanges still remaining under the manual system after the next group is set out will be Central, Brunswick, Cheltenham, Footscray, Hawthorn, Heidelberg, Ivanhoe, Sunshine, Williamstown, and Windsor. Melbourne is not quite so far advanced in the matter of automatic exchanges as Sydney. Within the next two months we shall be cutting over the large exchange of City South in Sydney, and that will wipe out City. The balance of the City subscribers, many of whom have already been connected with City North, will be connected to City South. The policy of the Department is to give all the States automatic exchanges equally. The manual exchange at Box Hill was built about 27 years ago. The number of subscribers is now 1,200; we could add another 200, and that limit will probably be reached in about two years, or rather less. The conditions at that time, however, will be very bad. There is no possibility of extending the present building. The new site is quite suitable for the purpose. It is at the telephone centre, and will provide all the room that is likely to be required for twenty years. Box Hill is a growing centre. The Box Hill telephone area is not being amended. The introduction of an automatic exchange generally makes a little difference to revenue, but in our estimates we like to be on the conservative side, and assume that it will not. With the automatic exchange the calling rate goes up a little. The ground rental to subscribers will not be altered. I have been in close touch with the Works and Railways Departments in the preparation of the information for the Committee. I am satisfied with the plans. There will be no difficulty in storing Post Office stationery and other things in the building now occupied by the present exchange. There will be no difficulty in placing our line store in the room marked on the plan "Line Inspector." There is also a small store on the other side which can be used if necessary. The portion below floor level is due to the fall of the land. The arrangement proposed will be quite satisfactory. I do not think it will be necessary at any time in the future to add a storey to the building.

2. To Mr. McGrath.—The sanitary arrangements proposed will be much better than those in the existing exchange. It will not be long before a sewerage service is available, and we are proposing to fit equipment for that purpose. At the outset we shall adopt the Kraus system if the sewerage connexion is not possible. I am satisfied that automatic exchanges have many advantages over manual exchanges.

3. To Mr. M. D. Cameron.—The present building, when the telephone equipment has been removed, will probably be sufficient for Post Office purposes for at

least twenty years. The proposed site is used partly at present as a depot for linemen, but there will be no difficulty in accommodating them elsewhere.

4. To Senator Reid.—For the purpose of transferring exchanges to the automatic system, we consider first those which need reconstruction or extension. At Box Hill we must either extend or reconstruct the present exchange, and therefore Box Hill is next in order for treatment. Mr. Murdoch will be able to explain differences in the cost of the buildings proposed at Box Hill and Cottesloe. I assume that the difference in size is the main cause of the difference in cost. The difference of £4,000 in the cost of equipment is due mainly to the difference in the calling rate at the two exchanges. The development of the area has radiated from the point where it is proposed to place the new exchange. One disadvantage is that the power plant and battery room will not be on the same level as the switching equipment, but that matter is not serious. We do not need any more accommodation below floor level than is provided by the partial excavation proposed. The same statement applies to accommodation on the postal side.

5. To Mr. Cook.—We are constructing all our new plant, including new exchanges, out of loan funds. That has been the policy of the Government for four or five years past. The policy previously, except for the years 1911-12, was to provide our requirements out of revenue. The more even the flow of development the more economical are our operations. It is sometimes inconvenient for us not to know the amount of money that will be available until shortly before it is available. There has been no change in the method of preparing our estimates except in the accounting of the money. We have always submitted our estimates to the Treasurer in precisely the same way. The Department is self-supporting. If Parliament decided that the Department must stand on its own, we should feel very happy, if we had all our revenue to operate with. The method of financing works is a matter for Parliament. We regard the telephone as one of the Government's best assets, and the sort of expenditure which gives most fruit. If Parliament decides that it is preferable to spend money in other directions, it is not for us to grumble. Both Cottesloe and Box Hill exchanges are necessary, and we cannot differentiate between them. We cannot differentiate between metropolitan and country areas. If the people of Melbourne say they want a service, we must provide it. If the funds are inadequate to provide everyone with a service, we clearly must do our best without differentiation. The fact that the country telephones do not pay and the metropolitan telephones do, would not influence us. We have to consider service as service, and to meet all requests for service from wherever they may come. I do not know that we have turned down any country exchange in favour of a metropolitan exchange. We have overcome the arrears, which were very heavy in the country a few years ago, and we are giving the country people the service they ask for. If we were to send out canvassers, I have no doubt that we would increase our country clientele. All we can do is to spend the money we have to the best advantage. I have not the slightest hesitation in saying that the country people would be well advised to adopt the telephone generally. I should favour canvassing for business. It would pay nationally to extend the telephone service in the country. It would satisfy the country in a large measure, it would aid their business, it would destroy the present sense of isolation, and would give them a measure of insurance that they do not now possess. If we had a large number of outstanding applications in the country, the Government would have to give us more money to meet them, or we would have to scheme

to meet them in some other way. The Box Hill exchange could, with advantage, have been built a year or two ago. By continuing the manual service, we have postponed a certain amount of capital expenditure. We are doing our best to give an efficient service to the country districts, as well as to the city. I have deputed an engineer especially to consider the question of rural automatic exchanges, and I have no doubt that the country will be greatly helped thereby. Because of the cost of staffing country exchanges, we are frequently able to provide a service only between the hours of 9 a.m. and 6 p.m. If such exchanges were automatic, subscribers would have a continuous service. If a farmer returns from his paddocks after 6 p.m., his telephone is useless to him, because the exchange is closed. If his local exchange was automatic, he could be switched on to the nearest exchange with a continuous service, and his telephone would thus be of use to him any hour of the day or night. That is our policy, but we have to move slowly, as the expenditure involved is very large. We are increasing the number of telephones in the country at a greater rate than ever before. At one time the proportion of city telephones to country telephones was roughly 60 to 40; now it is practically 50-50. The growth in the country is greater than the growth in the cities. Country people realize the benefit of the telephone, and are installing it in increasing numbers.

6. To Mr. M. D. Cameron.—We can establish a country exchange, and are doing it dully, with only two subscribers. A subscriber who is a long distance from the exchange to which he is connected has to pay an increased ground rental.

7. To Senator Reid.—The country districts of South Australia have developed very rapidly.

(Taken at Melbourne.)

MONDAY, 19TH SEPTEMBER, 1927.

Present:

Mr. Mackay, Chairman;	
Senator Barnes	Mr. Cook
Senator Reid	Mr. McGrath
Mr. M. D. Cameron.	

Reginald, Nyrn Partington, State Engineer, Postmaster-General's Department, Victoria, sworn and examined.

8. To the Chairman.—I have occupied my present position since 1924. I initiated, in conjunction with the Chief Electrical Engineer, the proposal for an automatic telephone exchange at Box Hill. The estimates given to the committee in 1922, as to anticipated telephone development, have been borne out. The number of subscribers connected at that time was 621, and there were 27 waiting. At the present time 1,200 are connected, and we are adding about twelve a month. The telephone business at Box Hill is of such a volume that it cannot be dealt with efficiently with the existing apparatus. It would be uneconomical to install additional apparatus of the same kind. To some extent there is a danger from fire in the present building. All the apparatus is not obsolete. We made extensions in 1925 and 1926. Subject to depreciation and the cost of installing, these boards are still serviceable. The theoretical telephone centre is less than a quarter of a mile from the proposed exchange. I am perfectly satisfied with the site. In 1922 the estimated cost per line was £20 16s. The present estimated rate is £15 6s. 4d. The difference in price is due to the reduced cost of material. The cost of labour is practically the same. The deferring of the Box Hill proposal has proved

desirable. I had something to do with the suggestion for the deferring of certain exchanges, because of the rise of prices, and, later, tenders fell to £14 per line. The service to the public at Box Hill has not suffered to any extent that the public would notice. We have had no complaints. The estimates of the recoverable value of the plant are within 10 per cent. We have very little recovered plant on hand. We could not afford to stock it for any length of time. Subscribers' apparatus can be reconstructed at very little expense. The more recent switchboards will probably need no more than re-polishing; but the older boards will need more costly repairs. We keep a close watch on our materials.

9. To Mr. M. D. Cameron.—We have canvassed Box Hill a little for subscribers. We have not obtained much business as the result of canvassing. There are some areas we dare not canvass. Malvern, for instance, is abnormal in its growth. We are connecting 100 lines a month, and it takes us all our time to put the apparatus in. We are canvassing in Victoria in selected places. We have had abnormal development in the last three years, but there has been a noticeable falling off in recent months. We have now probably reached the peak. We have done very well in the country without canvassing, but we are doing some canvassing now. The apparatus will take twelve months to install after we receive the material. We are a little tight now, and, if a fillip is given to development, we shall be in serious difficulties pending the delivery of further material. My branch is initially responsible for obtaining sites for telephone purposes. We have surveying officers who are specially trained in estimating telephone increases. If the engineer of a locality thinks the danger line is being approached he reports the matter and the officers go out and take a survey. We do not acquire sites until we can foresee development in the area.

(Taken at Melbourne.)

TUESDAY, 20TH SEPTEMBER, 1927.

Present:

Mr. Mackay, Chairman;	
Senator Barnes	Mr. Cook
Senator Reid	Mr. McGrath
Mr. M. D. Cameron	Mr. Seabrook

Lawrence Bede Fanning, Chief Inspector of Telephones, Central Administration, P.M.G.'s Department, sworn and examined.

10. To the Chairman.—I have prepared a statement for presentation to the committee:

The proposal before the Public Works Committee for consideration is to replace the existing manually operated exchange at Box Hill with a modern automatic switching plant. The existing exchange is of the non-multiple magnetic type and the equipment cannot be extended owing to building limitations to accommodate more than 1,400 subscribers' lines. It is estimated that the full capacity of the existing exchange will be reached by December, 1928. It is therefore, to meet new development after that date, it is necessary to open a new exchange.

It is the general policy of the department in Melbourne and other capital cities to replace manual exchanges that have reached the end of their useful life or the limits of their capacity with switching plant of the automatic type. The new exchange at Box Hill will be located at the rear of the post-office in which the existing exchange is installed. The equipment to be provided will have an initial capacity of 1,700 lines and will be capable of extension to the ultimate capacity of 5,200 lines, which it is anticipated will be reached in 20

years after the date of the opening of the new exchange. The financial aspect of the new exchange at the date of opening and five years thereafter is as follows—

Item	31/12/28	31/12/33
Capital cost, new and in situ	96,337	137,188
Total annual charges for proposed automatic exchange	12,775	17,312
Annual revenue	13,063	20,930

I have carefully considered the proposal, and I am quite satisfied that the proposed new automatic exchange is essential.

The life of a manual exchange depends on circumstances. As long as an exchange is capable of rendering useful service we can, under our present system, maintain the plant in operation. Twelve and a half years is the approximate life of a switchboard such as those at Box Hill. The more recent boards in that exchange still have a useful life before them. When in 1922 I said that the exchange would meet requirements until 1929 I had building limitations in mind. In my evidence at that time I expressed no doubt regarding the wisdom of the department in adopting the automatic system for metropolitan exchanges in the capital cities but I pointed out that if a manual exchange was capable of rendering efficient service it would be uneconomical to replace it with modern automatic plant. The comparison showing £2,090 in favour of the manual exchange was based on the existing plant at Box Hill. In my second comparison relating to 1929 I made allowance for additional plant to be added as far as I could estimate it at that time. I said that until the whole of the plant was automatic no particular advantage was to be gained by conversion. I said that it would be advisable to convert the larger exchanges first, and that there was no special reason at that time for converting Box Hill. Since that evidence was given, two large exchanges in Melbourne have been converted to automatic working, and two more will be converted in the coming year. The position is different now from five years ago. The automatic system is preferable to the manual system. It is a better financial proposition for the department. In large networks like Sydney and Melbourne particularly, the automatic system must prove more economical. My present opinions coincide exactly with my previous evidence. I made out a strong case for continuing the existing plant because it was capable of meeting requirements until 1929. My evidence was not that manual exchanges were better than automatic, but that at Box Hill we could carry on efficiently with the manual exchange until 1929. The position now is that we cannot extend the building and carry on with the existing plant. It is inadvisable to continue any longer, and, in any case, we must install a more modern manual plant. The type of board at Box Hill is suitable for exchanges with up to 500 lines. It is the non-multiple type of board. A telephonist is not able to complete local connexions except between subscribers on the same switchboard, but with multiple boards, such as we have at Hawthorn, Windsor, and Central, a telephonist can complete all local connexions. The number of subscribers at Box Hill on 31st August was 1,200. The total average number of calls originated during a day is 3,250, and the total number of calls during the busiest hour of the day is 412. The estimated number of subscribers at the end of 1928 will be 1,400. It is estimated that the number will increase within two years to 1,700. The annual rate of increase is now about 15 per cent. The limit of the number we can enter for with existing apparatus is 1,464. Box Hill is a very progressive area, and the time has arrived for a more up-to-date system. I have examined the figures prepared for the committee, which are worked out on a well-defined system, and I am in agreement with them.

I am satisfied that from the financial aspect the automatic system is necessary at Box Hill. There is, however, another important point. The tendency all over the world is to convert large net-works to automatic, and plans have been completed for the conversion of large cities like London and New York. The tendency is to develop machine, rather than manual, systems of switching. Departmental policy must to a certain extent be affected by developments in other parts of the world. On a switchboard such as that installed at Box Hill the number of local calls that can be answered per hour is 160; on a board such as those in use at Melbourne Central Exchange, 225 calls can be answered in an hour. There are many boards in use like those at Box Hill. Similar equipment to that at Box Hill is in use at Brunswick, Northcote, Oakleigh, Footscray, Frankton, Heidelberg, and one or two smaller places. When that equipment was installed it was quite suitable for the localities, most of which have developed very rapidly since. It has been possible in times of emergency to make such equipment in our own workshops. It is quite a general practice in other countries to use non-multiple equipment. The number of written complaints from Box Hill subscribers for the last six months was two per 1,000. The average speed of answer is a little over 7 seconds, and the average speed of disconnection 5 seconds. Eighty-five per cent. of the calls are answered in less than 10 seconds. These results are obtained by officers who visit the district and test subscribers' telephones under the same conditions as if the subscribers were using them. The total staff is thirteen telephonists and one monitor. The largest number employed at one time is eight or nine. The accommodation provided for the staff is very poor. Apart from the exchange equipment, we must provide better accommodation for the staff.

11. To Senator Barnes.—The tests made by officers are unknown to the exchange staff. In some instances subscribers have obligingly notified the staff that an inspector is making tests in the district. Tests are made under the direction of the traffic officer in charge of the service section at the General Post Office, at all hours of the night and day, and also on Sundays, Saturday afternoons, and holidays.

12. To Mr. McGrath.—It is difficult to make men available for tests in the country. The only reason for looking 20 years ahead is in respect of the building. We are providing plant only for two years ahead, and that we can reasonably forecast. It is possible that a new building or an additional floor will be needed in 20 years.

13. To the Chairman.—It may happen that in less than 20 years some of the traffic will be diverted to other exchanges. That will be determined by the cost of the outside plant. It is sometimes more economical to build a new exchange than to extend an existing one. It is desirable to keep the average length of line as short as possible. The average total cost of installing a service in Melbourne is close on £80. The inside plant costs £17 and the balance is for external plant.

14. To Mr. McGrath.—The site at Box Hill is near to what we call the telephone centre. Estimates of revenue have worked out fairly accurately. Five years ago I estimated that there would be 1,400 lines at the end of 1928. The position to-day shows that the forecast was nearly correct. The automatic system is more costly than the manual system to install, but cheaper in the long run. The policy of the Ministry in providing better telephone facilities in the country has increased our expenditure and involved the Department in a serious loss. That policy is largely responsible for the present loss in the Telephone Department. We are showing a profit in all the capital cities

on every subscriber's line of approximately 25s. Practically every exchange outside the capital cities is a losing proposition. We are spending more money per subscriber's line in the country than in the metropolis. The Ballarat telephone system is a losing proposition. I have examined the position at Ballarat, Bendigo, Geelong, Toowoomba, Ipswich, Rockhampton, Townsville, Kalgoorlie, Bunbury, and Mount Gambier, all of which are losing propositions. The explanation is that the rentals are lower in the country, and we do not receive so much revenue per subscriber. Subscribers in a large city like Melbourne have access to 85,000 other subscribers, but in Ballarat each subscriber has access at the minimum rate to only 1,500 subscribers.

15. To Mr. M. D. Cameron.—A survey of the district is really a house to house count. We also take into consideration the past rate of development. Five years ago Box Hill had only 400 or 500 subscribers. We have a definite basis on which we calculate the number of telephones. We consider the class of house, the size of house, and the cost of it. In industrial areas we have to take into consideration the possibility of the establishment of factories. The greatest development takes place in residential areas. A completely automatic system would give better service than a manual system, but with a mixed system I am not aware that there is much difference in the quality of the service. I should say that in Sydney the automatic system unquestionably gives a better service. Boards removed from Box Hill exchange will be sent to country exchanges. If necessary, they will first be re-conditioned in the workshop. The internal wiring of the board is complete and is not disturbed by removal. The jacks for some of the boards may have to be re-conditioned. If the building at Box Hill was larger we could probably carry on for three or four more years.

16. To Senator Reid.—The difficulty of giving a satisfactory service in large areas is largely responsible for the introduction of the machine system of switching. I admit that the service in Sydney was bad, but to-day it is reasonably satisfactory. One of the difficulties in Sydney has been the maintenance of the City Manual Exchange, which at the end of next month will become automatic. That will tend to improve the service considerably. The cost of the outside plant for an automatic exchange is the same as for a manual exchange. The capacity of an exchange building determines the quantity of plant we can put in. It will be necessary in time to open additional exchanges in Melbourne. We have two city exchanges in Sydney. The average cost of giving service is increasing, and will continue to increase. It increases in proportion to the increase in the number of telephones. As the network grows the apparatus becomes more complicated.

17. To the Chairman.—The high cost of automatic equipment was a factor taken into consideration by the Public Works Committee of 1922.

18. To Senator Reid.—I do not know of any development that will tend to reduce the cost of inside equipment. Prices have been considerably reduced since 1922.

19. To Mr. Cook.—The department does not make any automatic equipment, which is supplied entirely by manufacturers abroad. The statement that more money is being spent per subscriber on telephones in the country than in the cities applies for each financial period in the last three years. We are developing the service very rapidly in the country districts. The policy of the Government is to extend the benefits of the telephone wherever it is practicable to do so. Our figures show that we are carrying out that policy very effectively. I do not think that we could make better use in the country of the money proposed to be spent at Box Hill. If we do not spend money at Box Hill, we

must close down and refuse service to the people concerned. I do not know of any applications for service in any part of Australia that are not being provided. There may have been applications for the extension of trunk lines which we have decided in the public interest not to grant. The expenditure involved might have been out of all proportion to the revenue that would be received. We have not neglected rural interests. Everything possible has been done to meet the needs of the community. I should not say that telephone extensions should not be granted unless they would pay. The telephone is a vital factor in national development.

20. To Mr. McGrath.—The ground rent rate for telephones in Hobart is £4 12s. 6d., and in Ballarat £4 7s. 11. The rates are:—1 to 300 subscribers, £3; 300 to 600 subscribers, £3 5s.; 600 to 1,500 subscribers, £4 7s. 6d.; 1,500 to 4,000 subscribers, £4 12s. 6d.; above 4,000 subscribers, £5.

21. To Mr. M. D. Cameron.—Country exchanges cannot pay unless the rates are increased. The telephone system as a whole makes a loss, but the profit in the cities sets off most of the loss in the country.

(Taken at Melbourne.)

WEDNESDAY, 21st SEPTEMBER, 1927.

Present:

Mr. MACARTY, Chairman;

Senator Barnes | Mr. Cook  
Senator Reid | Mr. McGrath  
Mr. M. D. Cameron | Mr. Seabrook

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

22. To the Chairman.—My Department prepared the plans for this building. The site is at the corner of Whitehorse-road and Station-street. It has a frontage of 180 feet to Station-street and 60 feet to Whitehorse-road. The intention is to erect a new telephone exchange building at the rear of the post office. It will face Station-street and extend to the limit of the site at the back, where it will front a right-of-way opening into Station-street. When the exchange has been built there will be a space left between the post office and the exchange building of about 14 feet, and the exchange buildings will be on the alignment of Station-street on the one side, and will be kept back from the boundary of the adjoining property about 21 feet for portion of the distance, and 6 feet for the remainder of the distance. The main building will be 21 feet distant from the dividing line for the whole length of the building. The building will be of brick and of the generally simple architectural character which the Department has adopted for suburban telephone exchanges. The chief difference between suburban exchanges lies in the sizes of rooms. There is a fall of about 8 feet towards the back of the site, and to make the best use of that condition it was decided to keep certain rooms below the floor level of the switch room. What may be called the necessary rooms to the exchange—the power room, the battery room, the air-conditioning room, and a room for the line inspector—will be below the switch room. On the same level as the switchroom will be a luncheon room for the staff and the usual lavatory accommodation. The basement will cover an area of about 44 feet x 54 feet. The height of the ceiling of basement from

the floor will be 10 feet. All the floors will be of concrete. The ceiling of the switch room will be of concrete, protected by a light iron roof set behind parapets. The interior dimensions of the switch room will be 77 ft. 6 in. x 36 feet, the luncheon room 17 feet x 15 feet, and the store room on the same floor 10 feet x 7 feet. The entrance to the switch room will be from Station-street, and from the yard behind. Also, from the yard, a staircase will lead down to the basement. The basement floor will contain the cable well for bringing in the cables from Station-street, and a power room 18 ft. 2½ in. x 22 ft. 5½ in.; a battery room 25 ft. 5½ in. x 18 ft. 4½ in., a room for the line inspector 11 ft. x 22 ft. 5½ in., an air-conditioning room 26 ft. 9 in. x 14 ft. 9 in., and a space for fuel and boilers. In addition there will be two small rooms 9 ft. 6 in. x 6 ft. 5 in., and a room 4 ft. 5 in. x 10 feet 6 inches. Above the unexcavated portion indicated on the plan there will not be sufficient head room to enable any use to be made of it. An alternative method of construction would be similar to that recommended at Cottesloe, with a tiled roof and protecting eaves. At Box Hill the cheaper method would probably be better, but if the committee has any predilection for a tiled roof there is no reason why it should not be introduced. The extra cost would be between £100 and £150. The iron roof will hardly be seen behind the parapet. I recommend the building as proposed. The window frames will be of steel with wired glass as a safeguard against fire, and for the exclusion of dust. The estimated cost of the building is £6,000. It is a larger building than that proposed in 1922. The sewage system will be by septic tank until the sewer connexion is available. On the western side the distance from the boundary will be 21 feet to the main exchange and 6 feet to the annex. At the back the building will go down to the right-of-way and stop 6 feet short of the adjoining boundary. The present labour accommodation in the post office will be removed. The accommodation to be provided in the exchange will not be inconvenient for use by the post office employees. It will be about the same distance away from where they work as the existing accommodation. As the exchange provides sufficient space for development for the next 20 years, there will be same space lying idle in the meantime. I cannot suggest any use to which it can be put. If the building is carried out at present and extended later we should have to erect a temporary wall and a foundation to carry it. The full accommodation may be required in less than 20 years. The initial saving would be about £700, and the extra cost of providing the accommodation later would be about £100. The size of the building could be increased beyond the size shown on the plan only by going upwards. It is not designed to carry another storey, but that could be done at a not very large expenditure. The plan provides for 5,200 subscribers' lines. That is a big exchange for the suburbs. I receive my information from the Chief Engineer of the Postal Department. There is a big disparity between the 1,700 lines to be installed at the opening of the exchange and the 5,200 lines contemplated in 20 years' time. It is obvious that for five or six years there will be a lot of space lying idle. It is very undesirable to encourage the occupation of the switch room for any other purpose. I know of no method of making the building more dust-proof than is proposed. We provide doors and windows, which can be opened only with a carriage key, which is held by the man in charge. The building will take nine or ten months to complete after the contract is let. It is the policy of the Department to call for tenders. The difference between the estimate for the air-conditioning plant, £3,750, and the estimate of £3,100 given in 1922, is accounted for by larger and improved plant. There is no tendency for the cost

of such plant to decrease, but rather for it to increase. Legislation in New South Wales will tend to increase the cost of engineering, works, and plant may be reflected here. If the air-conditioning plant is not installed there will be some, but very little, extra space lying idle. The installation of air-conditioning plants is in the experimental stage. The post office officials are considering whether it is worth while spending such large amounts of money for this purpose. In certain centres they are trying to do without air-conditioning. The site is a good building site; it will not be hard ground to handle.

23. To Mr. McGrath.—To erect a smaller building now, including the construction of the temporary wall, and then later to pull down the wall and extend the building would cost an extra £100. A method to be considered is that in extending the exchange we would be opening the switch room to dust and disturbances. The matter is certainly worth considering. Setting off the extra cost of £100 against the saving in interest of £210 the net gain would be £110. The appearance of the parapet roof would be in harmony with the surrounding buildings, which are of a business type.

24. To Mr. M. D. Cameron.—My department will be responsible for the supervision of the contract. There will be a clerk of works in charge. We have an officer in each State who, with his staff, is responsible for the carrying out of works in those States. It is his duty to see the work is properly executed in accordance with specifications and drawings.

25. To Senator Reid.—A temporary wall would have to be left in place until the additions had been completed. It would be best to make the temporary wall of iron, but sun on the iron would make a difference to the air condition in the room. Some of the post office that we have built seem to be only partly used. The steel window frames fit closely, and probably are more dust-proof than the timber window frames. It might be an advantage to have double doors to the switchroom. The post office has an iron roof. There is provision for linemen in the building, but not for a linemen's store. To extend the basement further into the building would be very expensive.

26. To Mr. Seabrook.—The slope of the land shown on the plan is the natural slope. The drop in the foundation shown in the western elevation represents a concrete pit. The walls will have a two inch cavity. Partitions in the basement will be of brick. A number of the roofs in the neighbourhood are tiles, but most of them are iron. The post office provided me with the dimensions of the building required. The plant that we will put in will remain but may be added to. The plant to be put in at the outset is for keeping the atmosphere in the building clean, but it will not regulate the humidity. The size of the switchroom is in accordance with the post office estimate of the space required for 5,200 lines in 20 years' time. I am not in a position to criticize the size of the rooms. The engineer in charge of the equipment side of the proposal is most conscientious and competent. He does not make random guesses, but plans the equipment in detail and knows exactly the space it will require. A factor that may cause a variation is the type of plant that the contractor who gets the work will put in. One contractor may require more space than another. I expect that many new ideas about automatic telephones will be forthcoming when Mr. Brown and Mr. Beecher come back from America. Their report may have a considerable effect upon these proposals.

27. To Mr. Cook.—In the interests of economy I favour the roof as proposed. I do not see how we can save on the estimate. It is, of course, only an estimate, and actual tenders may be £3,500 or £7,000. The

estimate is likely to be between the highest and lowest tender. I have to provide in the most economical form I can the amount of room I am asked to provide. The basement is the cheapest way of obtaining accommodation. The only other way on this site would be to provide another storey, which I do not recommend at all. The design is as economical as we can make it. The question whether it is wise in a scheme like this to look 20 years ahead is a matter for the post office.

(Taken at Melbourne.)

FRIDAY, 23rd SEPTEMBER, 1927.

Present:

Mr. MACKAY, Chairman;	Mr. Cook
Senator Barnes	Mr. McGrath
Senator Payne	Mr. Seabrook
Senator Reid	
Mr. M. D. Cameron	

James Fleuning, Principal Mechanical Engineer, Department of Works and Railways, sworn and examined.

28. To the Chairman.—I have occupied my present position for about eighteen months. I am responsible for tests of air-conditioning plants in telephone exchanges. I have been associated with air-conditioning plants since we first started to install them. The type of plant installed in Australia is up-to-date and equal to anything in the world. The plant estimated for includes air washer, fan, refrigerator, and vacuum cleaning and compressed air services. The vacuum cleaning and compressed air plant is estimated at £325, and the direct radiator heating alone at £375. When the tests were first submitted in 1922 we had not had so much experience as we have now of air-conditioning plants, and could not arrive at such a close estimate. The present estimate is based on prices we have been paying recently in Melbourne. I have been responsible for at least half a dozen plants in Melbourne. The cost has been very close to the estimate—within 7 or 8 per cent. The plant has not yet been designed in detail, and when that is done a closer approximation to the correct figure can be given. I adhere to the estimate before the committee until the design in detail has been carried out. It may then be possible

to cut down the estimate by £200. The estimate of £2,750 for the air-conditioning plant at Oakleigh Exchange did not include vacuum cleaning and compressed air services, those being provided for in a separate estimate. In estimating for the air-conditioning plant of the later date we did not include vacuum cleaning and compressed air services. With those services excluded from the Box Hill estimate there is a difference between the two estimates of £375. That is accounted for by the fact that the Box Hill plant is designed to deal with 4,000 cubic feet of air per minute, whereas the Oakleigh plant is designed to deal with only 3,500 cubic feet per minute. Also, at Box Hill, the air-conditioning room is on a lower floor, and that involves a heavier charge for ducts. The whole of the plant will be made in Australia. We usually get very keen competition. There is a difference of £70 between Cottesloe and Oakleigh estimates. That is probably accounted for in the different arrangement of the building. Even in exchanges of exactly the same size the air-conditioning room may be in a different position, thus making the estimate of cost different. The cheapest arrangement is when the air-conditioning room is in the centre of the building, so that as soon as the duct enters the switchroom it can be split up in different directions. I do not think that prices are increasing very much. The estimate is based on previous figures and I cannot see that it indicates an increase in price. The extra 500 cubic feet of air per minute to be dealt with at Box Hill makes an appreciable difference. It means a larger compressor, a 10 horse-power instead of a 7½ horse-power motor, and longer ducts. For these installations tenders are always called, and there is good competition. Prices are cut as fine as for any class of engineering work.

29. To Mr. M. D. Cameron.—It is for the postal department to say whether artificial atmospheric conditions are required.

30. To Senator Reid.—We usually receive about half a dozen tenders in each State. For the duct work the tenders are nearly all from different firms. For the refrigerators there are about two firms which tender in all States, but there are usually three or four local firms in each State. There is not much difference in price in the different States. If anything, Sydney is a little higher than Melbourne and Brisbane, which are about the same.