1897.

VICTORIA.

# THE PARLIAMENTARY STANDING COMMITTEE ON RAILWAYS.

# FIFTH GENERAL REPORT.

PRESENTED TO PARLIAMENT PURSUANT TO THE PROVISIONS OF THE "RAILWAYS STANDING COMMITTEE ACT 1890" (54 VICT., No. 1177). SECTION 18.

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# FIFTH GENERAL REPORT.

*To His Excellency the* RIGHT HONORABLE THOMAS, BARON BRASSEY, *Knight Commander of the Most Honorable Order of the Bath; Governor and Commander-in-Chief in and over the Colony of Victoria and its Dependencies, &c., &c., &c.*

MAY IT PLEASE YOUR EXCELLENCY :

In accordance with the requirements of section 18 of the *Railways Standing Committee Act* 1890, the Parliamentary Standing Committee on Railways has the honour to submit the following Report of its proceedings since the 16th June, 1896, the date of the Fourth General Report :—

## I.—WORK OF COMMITTEE FOR PAST YEAR.

Questions considered during the year.

1. When the Committee presented its last General Report it had two questions under consideration, viz., the construction of a railway from Rupanyup to Marnoo, and the selection of localities for the permanent survey of narrow-gauge lines. During last Session the Legislative Assembly referred to the Committee the question of providing direct railway communication between the Northern Suburbs and Melbourne, and during the recess the Honorable the Minister for Railways requested the Committee to report upon the best route for the permanent survey of a narrow-gauge line between Colac and the Beech Forest, and upon certain proposed expenditure on the existing railway system provided for in the Schedule to the Railway Loan Application Act No. 1470, passed last Session.

Meetings held, witnesses examined, miles travelled.

2. During the past year the Committee has held 115 meetings. It has examined 138 witnesses, and has travelled 2,080 miles by rail, 615 miles by road, and 994 miles by steamer in connexion with the questions which have been under consideration.

Visit to Tasmania.

Early in May last the Committee visited the West Coast of Tasmania and inspected the 2-ft. gauge tramway which is in course of construction from the terminus of the Strahan-Zeehan railway to North-East Dundas, a distance of $17\frac{1}{2}$ miles. The 3ft. 6in. gauge railway from Teepookana to Queenstown (Mount Lyell), $4\frac{1}{2}$ miles of which is worked on the "Abt" system, was also visited. While in Tasmania the Committee was afforded the opportunity of inspecting some of the lines in that colony which have been constructed on the 3ft. 6in. gauge, with curves of 5 chains radius and 1 in 40 grades, through very difficult country.

Reports presented during the year.

3. With the exception of two items in the Schedule to the Railway Loan Application Act, the Committee has dealt with all the questions remitted to it, and has presented eleven Reports during the past year, viz. :—

Fourth General Report.
Report on the Rupanyup to Marnoo railway.
Report on the question of selecting localities for the permanent survey of narrow-gauge lines.
Supplementary Report on the same question, fixing the starting point for the Beech Forest narrow-gauge survey at Colac.
Report on the question of direct railway communication with the Northern Suburbs.
Report on the alternative routes for the Beech Forest survey.
First Progress Report on expenditure proposed under Railway Loan Application Act No. 1470 (Works at Benalla Station).
Second Progress Report (Regrading works on North-Eastern line).
Third Progress Report (Regrading works on Geelong and Camperdown line).
Fourth Progress Report (Improved Car Lighting).
Report on alternative routes for narrow-gauge permanent survey from Fern Tree Gully to Gembrook.

Rupanyup to Marnoo railway.

4. The Rupanyup to Marnoo railway was remitted to the Committee on the 13th February, 1896, shortly before the close of the 1895–6 Session, and was reported upon shortly after Parliament met last Session. The line remitted to the Committee was 20 miles in length, and was estimated by the Engineer-in-Chief to cost £55,331. The Committee rejected this line, which, it was shown, would probably not pay working expenses; but recommended an extension of the Lubeck-Rupanyup line to Banyena, a distance of 11·16 miles, at an estimated cost of £19,000. The Committee's recommendation was endorsed by the Legislative Assembly, but the Bill to authorize the construction of the line was rejected by the Legislative Council.

Selection of localities for narrow-gauge surveys

5. The question of selecting localities for the permanent survey of narrow-gauge lines was referred to the Committee on the 13th February, 1896, four months after its Report on the narrow-gauge principle had been presented to the Legislative Assembly. As soon as the question was remitted to it, the Committee received numerous applications from different parts of the colony for a visit of inspection. In order to limit the number of inspections as much as possible, the Committee, on the 20th February, 1896, passed the following resolution :—

"That districts desiring an inspection be called on for a statement of their claims to a narrow-gauge railway, including statistics of population, cultivation, and other sources of traffic, in order that the Committee may form an opinion of the resources of each district before deciding to visit it."

With the aid of the information thus obtained, and the data contained in the Reports of the first Railways Standing Committee, as well as the knowledge of the colony gained during recent years by members of the present Committee, a number of districts, most of which are situated in the hilly and mountainous portions of the colony, were selected for inspection. Fourteen localities were visited, viz. :—

Bass River District.
Beech Forest District.
Carrajung District.
Gembrook District.
Gunbower and Cohuna District.
King River District.
McDonald's Track District.
Mitta Mitta River District.
Moondarra and Walhalla District.
Orbost and Snowy River District.
Poowong East District.
Tolmie District.
Upper Murray District.
Wandin and Warburton District.

Evidence was taken at various places in each of these districts, and the Committee endeavoured, as far as time would allow, to see as much of each locality as possible, in order that members of the Committee might obtain a correct idea of the natural features of the country, and form their own opinions as to the quality of the soil, the character of the settlement, and the prospects of development. Reports of the railway surveyors who had surveyed broad-gauge lines in some of the districts were also obtained from the Railway Department, as well as other information contained in departmental papers.

After carefully considering the merits of the different localities visited, the Committee was of opinion that the most suitable districts for the trial lines and those presenting the strongest claims to a narrow-gauge railway were—

Wandin and Warburton District.
King River District.
Gembrook District.
Beech Forest District.

In most of the localities visited it was found that there were at least two or three rival routes. The consideration of these made the work of the Committee in some instances very difficult, and necessarily occupied a good deal of time.

There were several rival routes in each of the four districts selected, and, after inquiring as fully as possible into the merits of each, the Committee recommended that the Wandin and Warburton District should be served by a line running from

Lilydale to Yarra Junction ; the King River District by a line running from Wangaratta to Whitfield ; the Gembrook District by a line from Fern Tree Gully to Gembrook ; and the Beech Forest District by a line from Colac to Ditchley Park.

In order that the opinion of the Committee regarding each of the fourteen localities visited and the statistics and data collected might be placed on record for future reference, the Committee in its Report furnished a full description of each district, including the physical features of the country, the settlement, and the products grown. It is hoped that this information will be found useful hereafter in considering the claims to railway facilities of those localities which are not included in the four districts selected for the trial lines.

The Committee furnished its Report on this question to the Legislative Assembly on the 18th August, 1896, having examined 367 witnesses during the inquiry, and travelled 1,138 miles by road in the inspection of the different routes, and 2,268 miles by rail to and from the various districts.

Northern Suburbs lines.

6. The question of providing direct communication between the Northern Suburbs and Melbourne by railway was referred to the Committee on the 18th August, 1896. Beyond inspecting the districts interested, the Committee was not, however, able to proceed with the inquiry until the 29th September, pending the preparation by the Railway Department of necessary estimates of cost and prospective traffic. The Report on the question was presented to the Legislative Assembly on the 23rd December.

Several costly lines of railway running round and into the outskirts of Fitzroy and Collingwood and through the suburbs and country districts beyond those cities were completed about the year 1889. These lines have cost £845,661, and entail an annual loss on the Department of £46,670. No sooner were these circuitous routes opened for traffic than an agitation was started for direct railways through Collingwood and Fitzroy to join the metropolitan railway system at the Flinders-street terminus. The Railway Department proposed a scheme for effecting this object in 1890. This scheme was estimated to cost £911,151, of which sum £291,289 was to be paid for land and £619,862 for works. The proposals were remitted to the first Railways Standing Committee for inquiry, and that body rejected the departmental scheme but recommended the construction of two direct railways through Collingwood and Fitzroy on other routes, at a cost estimated at £581,203, of which sum £250,157 was for land and £331,046 for works, &c.; the districts interested in the construction of the lines to guarantee the interest on the cost of land taken for railway purposes until such time as the railways paid working expenses and interest on the cost of construction.

The scheme submitted to this Committee by the Railway Department was practically the same as that recommended by the first Committee in 1891, but the estimated cost of carrying it out was greatly reduced. The estimate furnished for the two lines amounted to £432,004, of which £170,391 was for land and £261,613 for works.

The Committee investigated several schemes in addition to that submitted by the Department, and made special efforts to ascertain if it were not practicable to serve the Northern Suburbs in a satisfactory manner by means of one line. The construction of one line only, with outer connecting loop lines, was opposed by the Railways Commissioner (Mr. Mathieson) and other expert officers of the Department, and they strongly recommended the construction of both the Collingwood and Fitzroy direct lines, preference being given to the Collingwood line in choosing which should be built first.

The Committee came to the conclusion that both the Fitzroy and Collingwood direct railways should be constructed, but that the Collingwood line should be built first ; the construction of the railways to be subject to the provisions of Part II. of the *Railway Lands Acquisition Act* 1893. The departmental reasons for the completion of the north suburban system by the construction of these lines, which had great weight with the Committee, and the reasons urged for and against them by witnesses outside the Department, are fully set out in the Committee's Report to the Legislative Assembly.

Alternative routes for Beech Forest survey.

7. On the 26th March last the Committee was requested by the Honorable the Minister for Railways to express an opinion for his guidance as to the best of two alternative routes for the permanent survey of the projected narrow-gauge line to the Beech Forest.

The Engineer-in-Chief had selected and was proceeding with the permanent survey of a line known as the "Lardner's Track" route, between the Gellibrand River (16 miles out from Colac) and a point known as Webb's selection in the forest. This route traversed country on which there was hardly any settlement. The surveyors had discovered a direct route which ran in proximity to the main forest road, and was accessible to nearly all the settlers beyond the Gellibrand. It was, moreover, 5 miles shorter, and much less costly to construct than the Lardner's Track route. After investigating the matter on the spot, the Committee was unanimous in deciding that the direct route should be adopted, and it reported to the Minister accordingly on the 8th April, 1897.

The Minister subsequently forwarded to the Committee a memorandum by the Engineer-in-Chief, which is attached hereto (*vide* Appendix A). There is nothing whatever in the further reasons urged by the Engineer-in-Chief in support of his views to cause the Committee to modify its opinion as to the relative merits of the two routes.

Expenditure under Railway Loan Application Act No. 1470.

8. On the 4th February last the Committee was requested by the Minister for Railways to inquire into and report upon the following works, included in the Schedule to the Railway Loan Application Act No. 1470, viz.:—

| | |
|---|---|
| Benalla—Engine shed and elevated fuel stage, lines of way, &c. | £13,500 |
| Melbourne (Spencer-street)—Concentration of goods business, increased accommodation for dairy produce, coal gears, and other improvements ... ... ... ... | 10,065 |
| North-Eastern Line — To complete regrading, including lengthening station yards ... ... ... ... | 19,000 |
| Geelong to Camperdown—Regrading line ... ... ... | 14,000 |
| Towards installation of improved car lighting (buildings, plant, &c.) ... ... ... ... ... ... | 10,000 |
| Towards installation of improved car lighting (lights in carriages) | 10,000 |
| Towards equipment of vehicles with Westinghouse brake ... | 15,000 |

As Parliament had been informed that the Committee would be consulted about these works before any money was spent on them, it was decided to comply with the Minister's request, although the reference was outside the Railways Standing Committee Acts. The Committee first proceeded with the inquiry into those works which, if carried out, would afford most employment during the winter months. The works at Benalla station were first dealt with, and on the 25th March, the following resolution was forwarded to the Minister, viz.:—

"That the Committee approve of the proposed expenditure at Benalla as, in their opinion, the works are necessary for the safe, economical, and convenient working of the important traffic of the North-Eastern railway and several of its branches. The Committee consider that the designs which have been adopted for the engine shed and the fuel stage are suitable and complete."

The regrading works on the Geelong and Camperdown line were next inquired into, and, on the 14th April, the Minister was informed that the following resolution had been agreed to, viz.:—

"That the Committee are strongly of opinion that the proposed expenditure of £14,000 on the regrading works between Geelong and Camperdown is not warranted by the present or prospective traffic on that line, and they recommend that the outlay be not incurred."

The Committee then dealt with the proposed expenditure on regrading works and lengthening station yards on the North-Eastern line, and, on the 14th April, forwarded the following resolution to the Minister, viz.:—

"That the Committee approve of the proposed expenditure of £15,700 to complete the work of improving the grades on the North-Eastern line, and the proposed expenditure of £3,300 for lengthening the station yards at Avenel, Longwood, Euroa, Violet Town, and Springhurst."

The Committee was unable to approve of the proposal of the Department to expend £20,000 on the partial introduction of an improved system of car lighting by means of "Pintsch" gas. After taking evidence on this and other systems of railway carriage lighting, a motion to approve of the expenditure proposed by the Department was rejected, and the following resolution was agreed to, viz.:—

"That an improved light in our railway carriages is essential, but the Committee are of opinion that, before recommending any new illuminant, fuller tests and information are necessary, both in regard to the cost and safety of the various systems; and further, that should Pintsch gas be ultimately found the cheapest and best system, the cost of plant and appliances will probably be materially reduced after the expiry of the patent rights in 1899."

The inquiry into the following items in the Railway Loan Application Act, which the Committee has been requested by the Minister to look into, has not yet been completed :—

| | |
|---|---|
| Melbourne (Spencer-street)—Concentration of goods business, increased accommodation for dairy produce, coal gears, and other improvements ... | £10,065 |
| Towards equipment of vehicles with Westinghouse brake ... ... ... ... ... | 15,000 |

The expenditure on both these items is only an instalment of an ultimate outlay which will amount to a very large sum of money—£59,500 in the case of the alterations at Spencer-street, and £45,000 in equipping vehicles with the Westinghouse brake so far as is considered necessary. This being so, the Commissioner was asked to furnish a complete plan of the projected alterations at Spencer-street station, and an estimate of the probable cost of the same when completed, and the Committee postponed dealing with the matter until the information was received. On the 8th June the Commissioner forwarded a memorandum with the desired estimate, and the Committee is now in a position to deal with the question.

In view of the fact that nearly the whole of the expenditure on the works on existing railways mentioned in this parapraph is to be charged to the loan funds, inquiry has been made as to the past practice of the Railway Department in this respect, and as to the amount now available for the construction of new railways. Statements have been obtained from the Department showing the expenditure of loan funds on new railways and on existing lines respectively during the years 1891–2 to 1896–7 inclusive; the items of expenditure on existing lines charged partly to capital and partly to revenue; and the loan moneys available for the construction of new railways. These statements are attached to this Report (*vide* Appendices F, G, and H).

## II.—Review of Work of Committee since Appointment.

9. This is the last General Report which the Committee can submit during the existence of the present Parliament, and it therefore takes this opportunity to review its proceedings since its appointment on the 31st October, 1894. Review of the work of the third Committee.

As the *Railways Standing Committee Act* 1893 provided that, instead of an unlimited number of proposals for the construction of new railways being referred to the Committee, only one line at a time could be remitted for inquiry, it was anticipated at the time of its appointment that the duties of the present Committee would be light compared with the work of the First Committee. This anticipation has, however, not been realized, as the new provision in the Amending Act of 1893 (section 11), for referring general questions to the Committee has been freely used, and a number of matters relating to existing lines, not contemplated under the Railways Standing Committee Acts, have also been remitted for consideration and report.

The present Committee has been in existence for about two years and eight months, during which time 307 meetings have been held. Total number of meetings.

Witnesses to the number of 680 have been examined in connexion with the inquiry into the questions which have been under consideration, while 10,262 miles have been travelled by rail, 3,000 miles by road, and 1,120 miles by steamer. A large amount of information has been laid before the Committee in writing, and carefully considered. Witnesses examined. Distance travelled.

In addition to the actual time the Committee has been engaged in its work, members have had to spend a large amount of time in travelling to and from the numerous meetings.

In dealing with the various matters which have been submitted to it, the Committee has endeavoured to lay the fullest information before Parliament. Since its appointment it has compiled and presented nineteen Reports. These may be divided into four classes—1st. Reports on proposed new railways remitted to the Committee by the Legislative Assembly on the motion of the Honorable the Minister for Railways; 2nd. Reports on general questions remitted to the Committee under section 11 of Act No. 1350; 3rd. Reports on questions referred direct to the Committee by the Honorable the Minister; and 4th. General Reports under section 18 of the *Railways Standing Committee Act* 1890. Reports of the Committee.

Reports on new railways.

The Reports on proposed new railways are four in number, and are as follows:—

Report on the Jumbunna to Outtrim railway.
Report on the Glenrowan to Edi railway.
Report on the Shelbourne to Cousen's Corner railway.
Report on the Rupanyup to Marnoo railway.

Reports on general questions.

The Reports on general questions which have been remitted to the Committee by the Legislative Assembly are five in number, and are as follows:—

Report on the question of further extension of railways in the Mallee districts.
Report on the question of narrow-gauge railways.
Report on the question of the selection of localities for the permanent survey of narrow-gauge lines.
Supplementary Report on the same question, fixing the starting point for the Beech Forest narrow-gauge survey at Colac.
Report on the question of direct railway communication with the Northern Suburbs.

Reports on questions referred direct by the Minister.

The Reports on questions referred direct to the Committee by the Minister are seven in number, and are as follows:—

Report on the plan of the new Flinders-street station.
Report on alternative routes for the Beech Forest survey.
First Progress Report on expenditure proposed under Railway Loan Application Act (Works at Benalla Station).
Second Progress Report (Regrading works on North-Eastern line).
Third Progress Report (Regrading works on Geelong and Camperdown line).
Fourth Progress Report (Improved Car Lighting).
Report on alternative routes for narrow-gauge permanent survey from Fern Tree Gully to Gembrook.

General Reports.

Three General Reports, under section 18 of Act No. 1177, have been presented by the Committee, viz.:—

Third General Report.
Fourth General Report.
Fifth General Report.

Effect of decisions regarding proposed railway expenditure.

10. The following statement shows the effect of the Committee's decisions with regard to definite proposals for expenditure of public moneys referred to the Committee for inquiry and report during the present Parliament:—

| Proposed Work. | Expenditure submitted. | Expenditure recommended. | Expenditure not approved. |
|---|---|---|---|
| | £ | £ | £ |
| Jumbunna to Outtrim Railway ... ... ... | 16,500 | 19,000 | ... |
| Glenrowan to Edi Railway ... ... ... | 62,292 | ... | 62,292 |
| Shelbourne to Cousen's Corner Railway ... ... | 15,432 | ... | 15,432 |
| Rupanyup to Marnoo Railway ... ... ... | 55,331 | 19,000 | 36,331 |
| New Engine Shed and other Works at Benalla Station | 13,500 | 13,500 | ... |
| Regrading Works, Geelong and Camperdown Line ... | 14,000 | ... | 14,000 |
| Regrading Works, &c., North-Eastern Line ... | 19,000 | 19,000 | ... |
| Plan for new Railway Station at Flinders-street ... | 88,444 | ... | 88,444 |
| Towards installation of improved Car Lighting ... | 20,000 | ... | 20,000 |
| | 304,499 | 70,500 | 236,499 |

Jumbunna to Outtrim line.

In the case of the Jumbunna to Outtrim railway, the line referred to the Committee was 3 miles in length, with a ruling grade of 1 in 40 and 5-chain curves, the estimated cost being £16,500. This route did not serve the Jumbunna mine, which was about a mile distant from the then railway terminus at Jumbunna township. The Committee recommended the construction of a shorter line along another route, 2·38 miles in length, with a 1 in 40 grade and 8-chain curves, at a cost of £19,000—the Engineer-in-Chief's estimate. The shorter route was adopted on the grounds that it would be less costly to work by at least £100 per annum, and would serve the Jumbunna mine.

The question which was remitted to the Committee with regard to the proposed new central passenger station at Flinders-street was whether the plan adopted by the Acting Commissioners was suitable or otherwise. The Committee reported that it was unanimously of opinion that the plan submitted to it was unsuitable. The reasons for arriving at this opinion were fully set forth in the Committee's Report, which was presented to the Minister on the 27th May, 1896, and subsequently laid before Parliament. The sum which the Acting Commissioners required to carry out their plan was £88,444, and the effect of the Committee's Report has been to postpone this expenditure. New railway station at Flinders-street.

11. In addition to the question of providing direct railway communication between the Northern Suburbs and Melbourne, which has already been referred to in paragraph 6, and the question of Narrow-gauge Railways, which is dealt with hereafter, advantage was taken of the provisions of section 11 of the *Railways Standing Committee Act* 1893 (No. 1350) to refer the question of further extension of railways in the Mallee districts to the Committee for inquiry. This question was remitted to the Committee on the 17th January, 1895, and reported on to the Assembly on the 25th July, 1895. A number of extensions were asked for by the holders of mallee land in different localities. The Committee inspected the routes suggested, traversing 566 miles of mallee country in doing so, and it examined a large number of witnesses. After fully considering the evidence, the Committee reported against further extensions in the Mallee until Parliament had dealt with the land tenure and compensation questions; and, as a Bill dealing with the settlement of the Mallee country was then about to be submitted for the consideration of the Legislature, the Committee placed on record in its Report the very full information it had elicited during the inquiry, and also the statistics of settlement and production which it had collected in connexion with the different extensions asked for by the settlers. These statistics, together with the description of the country and the settlement, as well as the Committee's opinions regarding the quality of the soil in the vicinity of the various lines inspected, will, it is believed, be of use in indicating the directions in which any future extensions should proceed. Recommendations regarding general questions. Northern Suburbs lines. Narrow-gauge question. Mallee railway extension.

## III.—The Question of Narrow-gauge Railways.

12. When the Committee reported in favour of the narrow-gauge principle in October, 1895, they drew special attention to a projected 2-ft. line on the West Coast of Tasmania which was being recommended to the Government of that colony by the General Manager of the Tasmanian Railways (Mr. Fredk. Back). Hearing that this line was nearing completion, and that part of it was open for traffic, the Committee went to Tasmania in May last to see how it had been constructed, what traffic it was capable of carrying, and if anything could be learned which it might be advantageous to adopt on the trial lines which are contemplated in Victoria. The Tasmanian 2-ft. gauge line.

Travelling from Launceston to Hobart over the 3ft. 6in. gauge line between those two cities, and thence by sea to Strahan on the West Coast, the Committee journeyed from the port of Strahan to the town of Zeehan over a 3ft. 6in. gauge line 28 miles in length. The 2-ft. gauge line, which is known as the North-East Dundas tramway, is practically a continuation of the Strahan to Zeehan railway. At first sight it appears singular that a railway manager and engineers in charge of such a narrow-gauge system as the 3ft. 6in., with a lengthened and intimate experience of its cost and capabilities, should break the gauge within 28 miles of a seaport and construct a 2-ft. gauge line for 17½ miles as an extension of a 3ft. 6in. gauge line. The wisdom of the course adopted is apparent when the country beyond Zeehan is traversed. The Committee was informed that the 3ft. 6in. line from the coast to Zeehan cost £8,000 a mile to construct a few years ago, although to-day it might, perhaps, be built for £7,000 a mile. The country traversed is not nearly so rough and broken, or so heavily timbered, as that between Zeehan and North-East Dundas; and there are no intermediate stations on the 3ft. 6in. line and no fencing. The Committee is informed by the General Manager that the 2-ft. line to North-East Dundas will probably be completed for £2,000 a mile, including surveys, engines, and rolling-stock, and that his engineers estimated the probable cost of constructing a 3ft. 6in. gauge railway through the same country at £10,000 a mile.

Country traversed. Excepting the first 5 miles, which is fairly level, the country traversed by the 2-ft. line is very mountainous, rough, and broken, and in several places very precipitous, similar to the country round Walhalla and at Mount Sabine in the Otway Forest. It is thickly timbered with a myrtle or beech forest, interspersed with King William pine and various kinds of eucalypti, and there is a dense undergrowth of scrub and ferns. The surveyors had to cut their way through the scrub to make the survey, which cost £103 per mile. At several points the mountains are so steep that it is difficult to keep a footing on the slopes along which the side cuttings have been made.

Works on the line. After leaving Zeehan the works are light for about 5 miles, and the line follows a course which is nearly straight. Thence onwards to the end of the tramway there are almost continuous curves, as the line winds through the mountains, and a straight run of a hundred yards can seldom be obtained. The radius of the curves is from 1½ to 2 chains. There are 300 such curves on the line, which is to be 17½ miles in length when completed. About 13 miles were completed at the time of the Committee's visit, and the works on the balance were well forward. The cuttings, side cuttings, and embankments are almost continuous, and there are several bridges and numerous culverts.

Cuttings. The cuttings are in slaty rock, clay mingled with rock, clay, and hard rock. The largest cutting is 60 feet on the deepest side and 33 feet on the centre line; there are other cuttings of 23, 25, 27, and 30 feet on centre line. There are also several short embankments.

Grade. The ruling grade from Zeehan to Mount Reid is 1 in 25, and from Mount Reid to Zeehan 1 in 30. These grades generally occur on the 1½-chain curves. The height of Zeehan above sea-level is 530 feet, and the line rises to 1,500 feet and falls again to 700 feet, again rising to 1,000 feet at the terminus (Mount Reid). The longest continuous grade is 1 mile in length. The grade on this mile is 1 in 25, and there are several curves of 1½ chains on the same portion. Some of the bridges are built on a 2-chain curve.

Rails. The rails used are mostly 43 lbs. steel—serviceable second-hand rails taken out of the main line from Hobart to Launceston, which has been relaid with 61-lb. steel rails.

Sleepers. The sleepers are 5 feet long by 8 inches by 4 inches, bluegum and stringybark, brought by sea from Hobart and other parts ; 1,980 sleepers to the mile are used.

Ballast. The ballast is obtained on the line ; 8 inches of ballast is used, 4 inches being under the sleepers.

Piles. The piles of one of the bridges are 50 feet long, and are footed in solid rock and cemented in with concentrates from the mines. Another bridge has 40-ft. piles. The bridge piles are obtained in the district traversed by the railway.

Engines. An engine has been obtained from Sharp, Stewart, and Co., of Glasgow. It weighs 14¼ tons empty, and 19¾ tons in working order. The Committee was informed that this engine has hauled a load of 50 tons over the 1 in 25 grade on the line, exclusive of its own weight, the paying load being 40 tons. It is estimated to haul 300 tons on a grade of 1 in 100.

Trucks. The trucks are built in Tasmania ; they are 16 feet long, 5ft. 4in. wide ; weigh 2tons 13cwt., and carry 10 tons of paying load. They are built on the bogie principle, double bogies with centre buffers, and the wood used is Oregon. Diameter of wheels, 21 inches.

Passenger car. It is proposed to build covered-in passenger cars similar to those used on other lines. The present car, however, is very comfortable for a short journey, and passengers are protected from the weather by thick glazed leather curtains.

Speed. It is proposed to run the 17½ miles in 1 hour 50 minutes, the speed on the curves being limited to 8 miles an hour ; 20 miles an hour can be run on the level.

Traffic. The traffic will consist at first of ore from the mines (Curtin-Davis, Hercules, Mount Reid, and others), stores, machinery, timber, and general merchandise, passengers, and firewood. The line can deal with any traffic offering.

Stations. There are twelve stopping places on the line, with sidings, and it is proposed to erect shelter sheds on these, but no platforms.

Fences and clearing. The line is unfenced, and only the track of the line is cleared.

Reports by Mr. Back, the General Manager of the Tasmanian Railways; by Mr. Rennick, the Engineer-in-Chief of the Victorian Railways; and by a committee of three Victorian Railway officers regarding this tramway are appended.

13. The Committee's views with regard to simplicity of construction, equipment, and method of working narrow-gauge lines, as set forth in detail in its Report presented to the Legislative Assembly on the 10th October, 1895, are given practical effect to on the Tasmanian tramway. The Committee will be well satisfied if the proposed trial lines in Victoria are constructed, equipped, and worked on the same economical standard. The projected narrow-gauge lines in Victoria.

In Tasmania, where the standard gauge is only 3ft. 6in., the 2-ft. gauge has been recommended to Parliament by the General Manager of the Railways, supported by the Chief Engineer and other officers. They are all consequently interested in making the narrow gauge a success, and every effort is made to take full advantage of the capabilities of the 2-ft. gange.

The position is different in this colony, where the proposal to depart from the 5ft. 3in. gauge for branch lines with light traffic has been initiated by the Legislature in opposition to the views and against the advice of the Engineer-in-Chief for Railway Construction. This is a very important difference, for the success of the narrow gauge depends on a variety of details, both as regards construction and method of working, and the carrying out of these details must ultimately rest on the executive officers of the Railway Department.

The views of the Engineer-in-Chief, as expressed in his evidence before the second Committee on the 24th July, 1894, are so strongly adverse to any departure from the standard gauge, and are in such contrast to other evidence elicited by the Committee, and the actual results obtained, both as regards cost of construction and working in countries where very narrow-gauge lines have been built, that the Committee felt it its duty to urge that he should not be asked to undertake the work of carrying out the construction of the trial narrow-gauge lines here.

This recommendation has not been given effect to ; the work of designing and constructing the lines being entrusted to the Engineer-in-Chief. This, the Committee is of opinion, is neither fair to that officer or to the important trial which is being undertaken.

Various matters in connexion with the survey of the trial lines have been submitted to the Committee during the recess. In dealing with the questions on which its advice has been courteously sought by the Minister, the Committee has always striven to secure the laying out of the lines so as to keep down the capital cost without impairing their efficiency, and has always borne in mind the fact that wherever a branch line is to be built the traffic will be light for years to come.

If all that is to be gained by the introduction of the 2-ft. gauge is the placing of the rails 2 feet apart on works substantial enough to carry the engines and rolling-stock of the 5ft. 3in. gauge, it is needless to say it would be absurd to depart from the Victorian standard ; but how much more is expected to be gained by the proper application of the 2-ft. gauge to the wants of the country districts is clearly shown in previous Reports, and it is not necessary to reiterate the reasons which caused the Committee to recommend its introduction for branch lines in this colony.

14. The following extracts from the Minutes of the Proceedings of the Committee show the divisions that took place during the consideration of this Report :— Divisions, section 5, sub-section 5, Act No. 1177.

TUESDAY, 29TH JUNE, 1897.

The Committee proceeded to consider their Fifth General Report.

Paragraphs 1 to 6 read, amended, and agreed to.

Paragraph 7 read—

Mr. Burton moved, That this paragraph be amended by omitting therefrom the words "The surveyors had discovered a direct route" with a view to insert in place thereof the words "A direct route had been discovered."

And, after discussion—

Question—That the words proposed to be omitted stand part of paragraph 7—put.

The Committee divided.

| Ayes, 5. | Noes, 3. |
|---|---|
| The Chairman, | Mr. Burton, |
| Mr. Harris, | Mr. Craven, |
| Mr. Melville, | Mr. Trenwith. |
| Mr. Morey, | |
| Mr. J. S. White. | |

And so it was resolved in the affirmative.
Question—That paragraph 7 stand part of the Report—put.
The Committee divided.

| Ayes, 6. | Noes, 2. |
|---|---|
| The Chairman, | Mr. Burton, |
| Mr. Harris, | Mr. Craven. |
| Mr. Melville, | |
| Mr. Morey, | |
| Mr. Trenwith, | |
| Mr. J. S. White. | |

And so it was resolved in the affirmative.
Paragraphs 8 to 12 read, amended, and agreed to.
Ordered—That the further consideration of the Report be adjourned until Tuesday next.

E. H. CAMERON, Chairman. (L.S.)
D. MELVILLE, Vice-Chairman. (L.S.)
JAMES BUCHANAN. (L.S.)
J. BALFOUR BURTON. (L.S.)
A. W. CRAVEN. (L.S.)
ALBERT HARRIS. (L.S.)
E. MOREY. (L.S.)
W. A. TRENWITH. (L.S.)
JOHN S. WHITE. (L.S.)

THOS. G. WATSON,
Clerk of Committees.

Railways Standing Committee Room,
Parliament House, Melbourne, 6th July, 1897.

# APPENDICES.

# INDEX TO APPENDICES.

# APPENDIX A.

## ZEEHAN TO NORTH-EAST DUNDAS NARROW-GAUGE TRAMWAY (2-FT.).

### REPORT BY THE GENERAL MANAGER OF THE TASMANIAN RAILWAYS (FREDK. BACK, ESQUIRE).

Tasmanian Government Railways,
General Manager's Office.
Hobart, 22nd March, 1897.

SIR,

Since I had the honour of addressing you in March, 1895, at the request of your Committee, and with the consent of the Premier of this colony, I have on several occasions been quoted as an exponent of the benefit of narrow-gauge railways, and as a believer in a break of gauge.

May I be permitted to explain that I am most strongly opposed to a break of gauge, as a break of gauge, and I look upon such a break as exists between the colonies of Victoria and New South Wales as little less, from a railway point of view, than a national calamity. Where you have easy, or moderately easy, country there is nothing to be gained by making narrow-gauge branches. On the contrary, it would be a disadvantage for many reasons which it is hardly necessary to dwell upon.

What I have always contended is that where you have very difficult country to traverse to open up and develop unoccupied lands—mineral or otherwise—and where the country cannot afford to make expensive roads or a broad-gauge railway—when, in fact, it becomes a question of a narrow-gauge railway or no railway—then I consider that a break of gauge is justifiable and the narrow-gauge railway is exactly what is required.

We have proved that a substantial 2-ft. line can be constructed in extremely difficult country for a sum not exceeding £2,000 a mile. By Victorian Parliamentary Paper C. No. 3 it is shown that the last railway constructed on the butty-gang system through very difficult country in Victoria cost £10,178 per mile, and this, as explained, under very advantageous circumstances.

When a railway is made into new country it takes some years to develop the traffic, during which time the loss of interest is a matter of very considerable moment, and from this standpoint I invite your attention to the following figures:—A branch line 20 miles long, constructed on a 2-ft. gauge in very difficult country, at a cost of £2,000 a mile will cost £40,000, the interest on which at 3½ per cent. is £1,400 per annum. Twenty miles of 5ft. 3in. railway constructed in similar country at the rate of £10,000 per mile will cost £200,000, which at 3½ per cent. interest would cost £7,000 per annum. The difference in the interest between the two lines, that is to say between £1,400 and £7,000 per annum, is £5,600 per annum. This in seven years at simple interest amounts to £39,200. Thus, practically in seven years the difference in interest in favour of the narrow-gauge line would actually have paid for its construction.

Since I had the honor of reporting to you in March and August, 1895, giving an account of the line we proposed to construct in Tasmania, circumstances have somewhat altered, and the very large body of ore discovered at the terminus of the line warranted our going to rather greater expense. The consequence is we have put in a line with a greater carrying capacity and heavier locomotives than we had at first designed. I have now the pleasure to forward you particulars of the line as being constructed, part of which is already open for traffic.

The locomotive, which weighs in working order 19tons 15cwt., is capable of hauling rather better than 50 tons up a grade of 1 in 25 in combination with curves of 99 feet radius. This means a paying load of 40 tons per train. Thus, *with only four trains* in each direction per day, we can carry in the year of 313 working days 100,000 tons.

The following is a description of the line:—

Gauge.—Two feet.
Gradients.—Maximum gradient 1 in 25.
Curves.—Minimum radius 99 feet.
Clearing.—Width cleared 30 feet, to be increased where necessary.

I may here mention that the clearing for a chain on each side of the line is being let to firewood getters, who clear the line for the value of the firewood, paying freight for its carriage to the terminus of the line. The wood is stacked at convenient places, and picked up by the ballast trains.

Earthworks.—The cuttings are 10 feet in width at base, and banks 10 feet in width at top.
Bridges and culverts.—The bridges are all timber, built of stringybark and bluegum. The culverts are log culverts and timber boxes, made from local timber, chiefly celery top pine.
Ballast.—The quantity of ballast is 800 cubic yards per mile, being 4 inches in depth under the sleepers.
Sleepers.—5 feet by 8 inches by 4 inches, of stringybark and bluegum.
Rails and fastenings.—The rails and fastenings, except the dog-spikes, which have been made in the colony, are second-hand from the broader gauge railways. The rails are of steel, 46 lbs. and 43 lbs. to the yard.
Rolling-stock.—The goods trucks, which are on bogies, have a carrying capacity of 10 tons, and weigh only 2tons 13cwt. 3qrs. each. Passenger cars seat 18 passengers, but we have had a car designed, which we are about to construct, seating 32 passengers. All rolling-stock, with the exception of the locomotive, was designed and built in the railway workshops.

Brakes.—In addition to the usual hand-brakes, all the rolling-stock is fitted with the vacuum brakes.

Construction.—The construction of the railway is being carried out in all its branches by piece-work and day-work, under a resident engineer, with very satisfactory results, both as to workmanship and cost. The average daily wage paid on this work is 7s. The cost of the line, including surveys and construction equipment, approximately £2,000 per mile.

I have further the pleasure to send you some photographs we had taken of different portions of the line, which will give some idea of the nature of the work.

I have the honour to be, Sir,
Your obedient servant,

FRED. BACK,
General Manager.

The Chairman, Parliamentary Standing Committee on Railways, Melbourne.

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# APPENDIX B.

## REPORT BY THE ENGINEER-IN-CHIEF OF THE VICTORIAN RAILWAYS (F. RENNICK, Esquire).

Board of Land and Works, Railways Construction Branch,
Melbourne, 28th April, 1897.

ZEEHAN TO NORTH-EAST DUNDAS (TASMANIA) 2-FT. GAUGE TRAMWAY.

*Memorandum for the Honorable the Minister of Railways.*

I have to report that, on the 7th and 8th instant, I made a careful inspection of the works of this tramway under the guidance of Mr. W. P. Hales, resident engineer of the West Coast Government lines, to whom I am greatly indebted for the trouble he bestowed in explaining and describing the features of the country and works of the line. The country to be served is hilly and mountainous and devoid of agricultural or even grazing resources, but its mineral capacity is held to be very great, and sanguine anticipations are indulged as to its future large yield of metals—lead, silver, copper, and gold.

The line has been recently described in the public journals, and by a committee of railway officers of this colony, representing the Engineer of Existing Lines, Traffic, and Chief Mechanical Engineers' branches, whose report I attach; and as you personally visited and inspected the line, and know its features and prospects, it is unnecessary for me to do more than briefly describe its engineering points from a professional standpoint.

The line is 17½ miles long, 13 of which were laid with rails and in use at the time of my visit. The first 5 miles are over undulating country, presenting no special engineering difficulties. For the first 2 miles leaving Zeehan the line is constructed about a chain to the left of and parallel to the existing 3ft. 6in. gauge railway from Zeehan to Dundas, belonging to a company, but worked by the Government in connexion with their Strahan and Zeehan line. From 5 miles to the end at 17½ miles the North-East Dundas tramway skirts high and precipitous hills, to all appearance forbidding country for railway making. Zeehan, the starting point, is 28½ miles by rail from Strahan, the port of Macquarie Harbor, and the tramway starts at a level 630 feet above the sea.

At 5 miles, where the country becomes difficult, the elevation is 829 feet. At the first saddle, 7 miles 60 chains, or 2 miles 60 chains further, the height reached is 1,280 feet, the average grade being 1 in 32, and the ruling grade, allowing for curvature, 1 in 22. This point is, as the crow flies, 1 mile 60 chains from the 5-mile point.

At 10 miles 50 chains or summit point of line, 2 miles 70 chains further, the height is 1,600 feet, the average grade being 1 in 48 and the ruling grade, allowing for curvature, 1 in 26. The direct distance from the first saddle is 1 mile 20 chains. From the summit the line descends to the Ring River at 15 miles 40 chains, where the elevation is 826 feet, the average descending grade being 1 in 34, and ruling grade, allowing for curvature, 1 in 25. Here it is intended to throw off an extension northerly to other mining country when required. The direct distance from 10 miles 50 chains to 15 miles 40 chains—4 miles 70 chains by the line—is 1 mile 70 chains. Then skirting up the Ring River, still on the sides of precipitous hills, the line reaches its terminus at 17½ miles, at an elevation of 1,110 feet; the average grade up this part is 1 in 37, and the ruling grade, allowing for curvature, 1 in 25. The direct distance from 15 miles 40 chains on the Ring River to the end is 67 chains, the distance by line being 2 miles. The total direct distance from 5 miles to the end at 17½ miles is 5 miles 40 chains; thus the direct length of the 12½ miles (from 5 to 17½ miles) of difficult country is only 5½ miles, or the constructed line is 2¼ times the direct distance; and to obtain workable grades without going into very heavy works, this 12½ miles of line had to be twisted on gradient contours all this extra distance, the curvature being 56 per cent. of the whole length, and the degrees turned about 17,000—making it one of the most twisting lines, for the distance of 12½ miles, that I know of. On this account the wear, tear, and resistance from curvature must tell largely on the working expenses. However, if a cheap line is justifiable, and I believe it is under the prospective traffic conditions, this feature could not have been well avoided.

The plans and sections accompanying this report, for which I am indebted to Mr. McCormick, Engineer of Tasmanian Railways, clearly illustrate these features of the line.

The formation widths in cuttings is 10 feet, and on banks 10 feet to 15 feet. The earthworks for the 12½ miles of difficult country are moderately heavy, the line being mostly in rock cuttings, standing well at very steep side slopes often approaching the vertical. The few clay cuttings also stand well at much steeper slopes than usual. In this respect and as regards prospective slips the country is singularly favorable for economical earthworks.

The tramway, occupying as it does a position near the watershed lines of the country, no considerable amount of water provision was necessary, and the few bridges required serve more as trestles than flood openings.

Local timber, obtained quite close at very low cost, has been largely used for culverts. The bridge timbers and sleepers are mostly stringybark and bluegum, brought by sea and rail from a distance.

The rails are second-hand, 46 and 43 lb. steel ; sleepers, 5 ft. x 8 in. x 4 in., about 2,100 per mile ; the ballast is 8 inches deep, 4 inches being under the sleepers.

The permanent way and the works generally are of a most substantial character, and on this I can heartily congratulate the designers of the line, who have not been influenced by the clamour and representations of agents and abettors of Continental light and portable narrow-gauge permanent way and rolling-stock manufacturers, that rails of 20 lbs. or thereabouts, and engines of 6 tons to 12 tons, are adequate for 2-ft. or 2ft. 6in. gauge general traffic railways in the Australasian colonies.

In this connexion I may here mention that during my visit to the Mount Lyell railway and smelters, I found the authorities taking up 20-lb. rails—down only a few years—on their 2-ft. gauge trams at Queenstown, and replacing them with 34-lb. rails, and heavier sleepers, which accords with the experience in working 2-ft gauge lines wherever this gauge has been adopted for general railway traffic.

The sharpest curve on the N.E. Dundas tramway is 1½ chains radius, constituting 56 per cent. of the curvature on the 12½ miles of difficult line. The steepest grade is 1 in 25, combined with a 2-chain curve, making the grade which rules the load to N.E. Dundas equal to 1 in 22. The ruling grade the other way is slightly easier. At present the rolling-stock equipment consists of two engines, one a small German tank by Krauss and Co., about 6¼ tons, the other a tank engine specially made for the line by Sharp, Stewart, and Co., of Glasgow, weighing fully loaded about 20 tons, and a small number of waggons. The traffic now is chiefly ballasting, and haulage of materials for construction, small quanties of goods for the miners, and firewood for the Zeehan mines obtained from clearing along the line.

No ore, if yet produced, has been carried from the N.E. Dundas mines. The 20-ton engine is said to haul 50 tons up the ruling grade, of which 40 tons is reckoned to be ballast. Of course the ballast load, or mineral load, is never realized in the haulage of general goods, whatever the character of the rolling-stock ; and paying loads of 30 tons will probably be the maximum in ordinary working.

The line, so far as built, is a mere skeleton railway with a couple of sidings, equipment being wisely left to be provided when the traffic demands it. Although this line has been under construction for more than fourteen months, the rails are not expected to reach the terminus till August or later, depending on the weather, which on this portion of the west coast of Tasmania is generally very severe, with a big rainfall blocking works in winter.

A portion of the line is heavily timbered, and only sufficient width for the earthworks has yet been cleared. The extra clearing required for safety of trains, life, and property will, it is expected, cost little or nothing, as the stuff, cut into firewood and delivered at Zeehan, will pay for the labour. In this respect, as well as in the stability of the earthworks, the line is in an exceptionally fortunate position. The work is being carried out under what is known here as the butty-gang system, or small contracts, piecework, and day labour, direct by the Government without the intervention of middlemen. The engineers in charge of the construction were unable to give me the estimated cost based on permanent survey, as no definite works for stations or equipment had been decided on, and no quantities or prices had been computed for the earthworks, bridges, carriage, permanent way, engineering provision, &c. The cost set down in some recent Reports of £2,000 per mile appears a mere surmise. The money allotted by the Government for the work is, according to the last Tasmanian Railway Reports, £24,000. At £2,000 per mile, the expenditure will be £35,000. But allowing for any moderate equipment for stations, junction works, sidings, repairing shops, sheds, &c., and rolling-stock for a thriving mining traffic, when the permanent-way material, railway and sea carriage, engineering supervision and surveys are added, the £2,000 per mile lately named will, in my opinion, be very much short of the mark. The line has been skilfully laid out along the sidelings of the hills to suit the features, regard being had to economy of construction and workable curves and grades. It might be thought that the excessive curvature and lengthening—the features that at first strike an engineer—were introduced to produce the cheapest line possible between Zeehan and N.E. Dundas ; but reference to the plans and sections will show that the necessity of obtaining fairly practicable grades for an adhesion line is mainly responsible for these. The line could only have been shortened without still further steepening the grades by recourse to very costly works, which would not be justified by any reasonably prospective traffic. The Strahan-Zeehan line and Zeehan-Dundas line are built on the Tasmanian standard gauge of 3ft. 6in. Had it not been decided to break the gauge, about 2 miles of the Dundas line might have been used for this extension to N.E. Dundas, leaving 15⅓ instead of 17½ miles to construct, and the maintenance of 2 miles of extra line might also have been saved. The question is, could the N.E. Dundas line have been constructed and worked on practically the same alignment on the gauge of 3ft. 6in.? I have no hesitation is saying that it could; and the working would have been cheaper and more efficient, giving a cheaper, quicker, and altogether a better service to the users of the line at very little extra cost for construction. Of course, new rolling-stock would be required in either case, as the English type of which so much of the Tasmanian stock consists would not run freely, if at all, round the 1½ and 2 chain curves of this tramway. But any skilled manufacturers of locomotives would undertake to furnish engines of double the power of the 20-ton engine now on the line (about the most powerful possible for the 2-ft. gauge), for the 3ft. 6in. which would work these curves without more resistance or wear and tear ; the cars and waggons would offer no difficulty. The formation width being 10 feet, the same as on the Mount Lyell railway—another west coast line just completed—built on the 3ft. 6in. gauge, would, on a pinch, suffice for the 3ft. 6in. line. But if it were deemed necessary to make the width 12 feet instead of 10 feet, it could be cheaply effected by widening out on the low or left-hand side—the line being mostly in cutting and offering tempting facilities for this purpose. A very few dry stone walls at small cost for supporting the wider banks might be required. Had it been decided to construct on the 3ft. 6in. gauge in the first instance, it would have been a good investment to have spent a small sum in reducing the sharpest curves from 1½ to 2 chains radius.

Thus a break of gauge, with all its attendant disadvantages of delay, loss, and irritation, might have been avoided, and the total cost of construction and equipment, taking into account the 2 miles' saving at the commencement, the sidings and changing station at Zeehan would not have exceeded the finished cost of the present line. Should the traffic on this line develop to fairly large proportions, it is quite conceivable that the authorities when they become duly apprised of what can be and is successfully done in working sharp curves on broader-gauge lines elsewhere, will convert this into a 3ft. 6in. line with 60-lb. steel rails, on which they might run trains of double the weight possible on the 2-ft. gauge.

I have been taken to task for recommending rather than break the gauge in Victoria the construction of 5ft. 3in. lines, with steep grades and sharp curves, for a light traffic, in the hilly and mountainous districts. The proposal has been termed disastrous by one of the irresponsible expert advisers of the Railways Standing Committee, who deprecates anything steeper than 1 in 50 for the ruling grade on any gauge line. (*See* extracts from evidence attached hereto.)

This 2-ft N.E. Dundas line, with its 1 in 22 ruling grade and excessive proportion of 1½-chain curves, is one of the most conspicuous examples of a steep grade, sharp curve, adhesion railway in the world, yet, strange to say, this expert authority now advises the Committee that it is an excellent model to copy for the hilly and alpine farming districts of Victoria—rather inconsistent advice, most people would say. In the case of lines recommended by me, 50 to 60 ton engines might be used if the traffic ever developed to require them ; in the example recommended as a model by this expert, a 20-ton engine is about the greatest that could be used, with correspondingly small train loads. My proposal is condemned on account of the smallness of the loads which could be taken up the steep grades. What shall be said of the many times smaller loads on the 2-ft. Tasmanian tramway recommended as a model for Victoria ?

In a recent letter to the Railways Standing Committee the General Manager of the Tasmanian Railways compares this 2-ft. tramway with the Jumbunna to Outtrim coal line on the 5ft. 3in. gauge in Victoria, very much to the disadvantage of the latter. Mr. Back is, no doubt, familiar with the physical features and traffic prospects of his N.E. Dundas line, but he must be completely ignorant of the features and conditions of the Outtrim coal line.

First, notwithstanding the capacity of the 5ft. 3in. gauge in permitting very powerful engines to be used, it was deemed necessary to secure cheap haulage, such as a coal traffic only will stand, to make the ruling grade on the Outtrim line 1 in 40 as against his 1 in 22. Again, it was necessary to construct as direct a line as possible—consistent with cost—for the same reason. Coal being of low value compared with the metalliferous ores of Zeehan or Dundas—10s. as compared with £10 per ton—can stand only about ½d. per ton per mile for direct haulage, as against many times this rate charged for the Zeehan and Dundas ores for circuitous haulage.

Again, the output of coal on the Outtrim line is something like 200,000 tons per annum, with a prospect of 50 per cent. increase in a short time, against an output of 20,000 tons or so, the most that can be fairly expected on this N.E. Dundas tramway. What sort of railway manager would he be that would make lines identical in gauge, grade, and length for such diverse conditions as these? How would the coal companies like to pay for a haulage of 5 miles, say, instead of 2½ on the Outtrim line, at, say, 2d. to 4d. per ton per mile instead of ½d.? Extend this for 17½ miles, the constructed length of the N.E. Dundas tramway, instead of about 10 miles if built on the pattern of the Outtrim line, and how would the coal companies like it ? For if the principle is good for 5 miles, it must also be good for any longer distance where the physical features and other conditions are similar. Where then would our coal industry be if the N.E. Dundas tramway model had been applied to the construction of our coal lines ? Of course, no one in his senses would have made the Outtrim line, or other coal lines, on the model of this tramway, which is now pressed for our initiation by irresponsible advisers of the Committee.

When Mr. Back makes a comparison of two lines 20 miles long through very difficult country, one constructed on the model of the Outtrim 5ft. 3in. gauge, with a station to every mile, at £10,000 per mile, the other on the model of his tramway, with no stations or equipment, at £2,000 per mile, his comparison is of things existing only in his imagination, and not in reality. A fair comparison would be thus :—

A direct line 20 miles long, on the model of the Outtrim line, 5ft. 3in. gauge, 1 in 40 ruling grade, equipped with stations at every mile, and for a coal traffic of 300,000 tons, to be conveyed at ½d. per ton per mile, or a charge to the coal freighters of £12,500 per annum, costing to construct, including rolling-stock, 20 miles at, say, £11,000 = £220,000, as against a circuitous line, 40 miles long on the model of the Tasmanian 2-ft. tramway, 1 in 22 ruling grade, with station every 2 miles, and equipped for the same traffic, which would require a double line at a cost of, for 40 miles, at £6,000 = £240,000, on which the freighters would have to pay, at the Tasmanian mineral rate (2d. to 5d. per ton per mile), say, 2d. per ton per mile = £50,000 per annum. Can there be a difference of opinion as to which would be best for the country and the users of the railway ?

Comparisons are odious, and any comparison, without knowing and taking into account all the circumstances of the objects compared, is worthless.

The circumstances justified the construction of the Outtrim line on the standard gauge, at £10,000 per mile, the same as the local circumstances seem to warrant the construction of Mr. Back's tramway ; but, all the same, it appears to me to have been a mistake to break the gauge in this instance for the reasons already stated. It speaks against the perspicacity of a railway manager when we find him generalising in this way, and seriously comparing a pony with a cart-horse for performing widely diverse work ; but I cannot hold so poor an opinion of this gentleman's capacity as to believe he would seriously recommend a railway on the model of his 2-ft. gauge line for dealing with the coal traffic of the Korumburra, Jumbunna, and Outtrim mines, if he knew anything about railway coal traffic, or the local conditions of these coal-fields.

F. RENNICK,
Engineer-in-Chief.
28.4.97.

EXTRACT FROM COMMITTEE'S REPORT ON THE QUESTION OF NARROW-GAUGE RAILWAYS, pp. 137–8.

*The Hon. Sir W. A. Zeal.*—I read in the newspapers a proposal on the part of the Engineer-in-Chief to construct railways on a certain plan which I thought would be a great misfortune for the colony; that is, introducing unusually steep gradients and sharp curves. I notice that rather than advocate the construction of narrow-gauge railways he would adopt 5-chain curves and grades of 1 in 20. I say that such a line would be practically useless. You could not carry any paying load upon it. I have looked over the evidence given before you by engineers, and I find that Mr. Mais advocates on narrow-gauge lines gradients of not less than 1 in 50, with minimum curves of 7 chains radius. I entirely agree with him. It is most undesirable to introduce difficulties on railways which would prevent their ever being economically worked.

* * * * * * * * *

It seems to me little short of madness to propose constructing lines with 1 in 20 grades and 5-chain curves in the mountains. Any man of ordinary intelligence must see that such a thing can only end in financial failure. With reference to the cost of the two gauges, you have thoroughly exhausted the evidence.

* * * * * * * * *

I would not go below a grade of 1 in 50 on light narrow-gauge lines worked on the adhesive principle.

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# APPENDIX C.

## REPORT BY THE COMMITTEE OF OFFICERS OF VICTORIAN RAILWAYS.

March, 1897.

### STRAHAN, MACQUARIE HARBOR, TASMANIA.

Strahan Wharf to Zeehan, 28½ miles line; gauge, 3ft. 6in.; grades, 1 40 for 7 miles, with 5-chain curves.

Up journey carry 20,000 tons of ore yearly; average commercial value, £10 per ton.

See list of special fares and freights for this line. Fares—1st, single, 4d. a mile, minimum 6d.; 2nd, single, 3d. a mile, minimum 4d. Return, fare and a half. Freights—2d., 3d., 4d., 5d., 6d., 9d. per mile. All general goods come under 9d. per mile rate.

At Zeehan, a company's train of 2-ft. gauge is running from the station through the town to the various local mines. Fares, 6d. to town, and *vice versâ*. Mr. Smith is the manager, and the other employés are one driver, one guard, with three men, who attend permanent way and transhipping.

Rails, 40 lbs. steel; sleepers, 5ft. x 8in. x 4in., jarrah or messmate; Krauss engine.

Mr. Smith, in talking with Mr. Hales and Mr. Nickolls, stated that a travelling winch would be useful for transhipping between 3ft. 6in. and 2-ft. gauge, and suggests the Goliath. His cost of transfer is 1½d. per ton for ore, up to 1s. per ton for the most troublesome goods handling. He states that four men at 6s. per day will tranship by hand from truck to truck 200 tons ore (contained in 1 cwt. packages) daily.

### ZEEHAN TO NORTH-EAST DUNDAS.

*Two (2) feet Gauge Tramway.*

Constructed by Government. To be 17½ miles long; 12½ miles made at date of visit, March, 1897.

*Construction, Equipment, &c.*—Rigid economy exercised in first cost. Formation width 10 feet; slopes of cuttings ¼ to 1 to ¾ to 1 through all sorts of rock and soil. Drainage provision in cutting very little. Nature of soil, soft sandstone, hard slate, and conglomerate trap rock, clay, &c. Cost of clearing, 12s. to 20s. per chain through forest; width of clearing, 30 feet; line heavily timbered each side. No fencing, and consequently no cattle pits nor gates.

Rails, 46 lbs. second-hand steel, in 24 feet lengths. Sleepers, 5ft. x 8in. x 4in. bluegum and stringybark, machine adzed, nine to the rail. Ballast, under sleepers 4 inches and boxed. Total ballast, 8 inches.

First 5 miles of tramway, straight run with not many curves (time taken, twenty minutes), thence 800 feet rise in 5½ miles to summit, a succession of curves; 1½ and 2 chains radius. Grade, one piece 1 mile, 1 in 25 (compensated as much as possible to summit, thence dropping 1 in 30 to end). Sharpest curve on 1 in 25 and 1 in 30, 2 chains. No transition curves.

Station accommodation, none; platforms, goods and passenger, none. At one place, "the camp," a small paling shed for goods erected at cost of about £10.

Passengers enter and leave train from permanent way. There are sidings at eight places, put in specially for mines; some only 1 mile apart.

Facing points locked by pins through blade and stock rail; guard carries key. Two men can hand shunt a loaded truck.

Station yard and road approaches to sidings are metalled.

No cranes, closets, or other accommodation.

A house is erected at one place for ganger, who will also look after station.

A telegraph line runs alongside to be used either for telephone or telegraph—not decided yet.

There are no signals. No train staff nor similar safeguards at present. Trains are to run in daylight only.

*Engine Power.*—One Krauss engine 6¼ tons, and one Sharp, Stewart, and Co., road-worthy, 19tons 15cwt. Wheel base, 5ft. 6in. Speed limited to 8 miles. Actual speed rising about 4 miles an hour with load. Load on our trip was about 45 tons dead weight behind engine. It consisted of engine, four bogie trucks of ballast, and passenger car. Engine slipped on journey but did not stick. Had to use sand starting up grade out of pit.

Engine has six wheels, four coupled and a radial bogie, but requires turntables at each end of line.

*Rolling-stock.*—All trucks, bogies; four flat, twelve low-sided; sides let down. Tare, 2tons 14cwt.; load, 10 tons. Flat trucks furnished with stanchions to carry 5-ft. wood.

Present passenger car. (1.) Has cross seats, with oilcloth curtain sides, one end glazed, the other boxed, with guard standing behind on open platform.

There was an unusual and jerky longl. motion in car on portions of the journey. (Due probably to balancing of engine.)

No continuous drawgear in train. Front head stock of front car carries weight of train behind.

*Brake.*—It is intended to fit all the rolling-stock with the automatic vacuum brake.

*Train Crew.*—Train crew consists of two men on engine and a guard. They tried one man on engine and wanted a second. Guard cannot reach engine.

Wages paid—Driver, 12s. 6d.; fireman, 9s. 6d.; guard, 7s. 6d. Long hours (twelve and over), but no overtime.

*Rates and Fares.*—Preliminary fares for 5 miles (to camp), 2s.; to head of road (12½ miles), 5s. Freight to head of road, £2 per ton (formerly £10 per ton by pack horse).

Freight for firewood cut by men that cleared line and stacked alongside, 2s. a ton up to 5 miles—80 feet to the ton.

*Transhipping.*—In transhipping 2-ft. truck and 3ft. 6in. truck floors at same level. Space of 1 foot between sides of waggons standing opposite each other. Small shed to effect transfer in wet weather. (*See* notes on first page, also *re* transhipping.)

### Strahan to Mount Lyell.

Boat from wharf to Teepookana, 2s. 6d. return; cross Macquarie Harbor, 3 or 4 miles up King River, winding between forest and high hills. Time, about 1½ hours. Scenery very pretty, and grand in some places.

Teepookana to Queenstown, 15 miles by rail. Fares, 5s.; return, 7s. 6d. Freight, 16s. 6d. per ton.

Train consisting of Abt engine, loaded trucks, and two or three other waggons, fitted with corrugated iron roof, seats, and curtains for passengers. Starts from boat wharf and runs along the King River, winding and rising on sideling for a few miles; then leaves the river and afterwards turns into a rack railway rising 1 in 20 for about 3 miles, thence descending by rack about 1½ miles of 1 in 16, thence ordinary line to Queenstown terminal.

Gauge of line, 3ft. 6in. Railway owned by the Mount Lyell M. and R. Company. Cost estimated at £8,000 a mile (not verified).

Beyond Queenstown the 3ft. 6in. gauge continues for a mile or more to the smelters, with addition of a third rail for 2-ft. gauge, and this has several branches leading to quarries of quartz and milestone and to saw-mill, brick-kilns, &c.

Beyond the smelters the 2-ft. gauge runs for a mile or more towards Mount Lyell rising, the ruling grade being 1 in 16, with 2-chain reverse curves at places. The engine journey has then finished, and the 2-ft. trucks are hauled by cable to top of hill up grades 1 in 2, 1 in , and 1 in 5; length, say 50 chains, then dropped down 1 in 5 grade on other side to the mine, say 35 chains by cable. An engine is on top for hauling, and as the trucks on the grades on either side practically balance each other, the winding engine does little more than overcome friction.

### Remarks.

The Mount Lyell Company's lines and the 2-ft. town Zeehan trains being in existence first would naturally be a guide to the Government when North-East Dundas line was contemplated.

It is estimated by Tasmanian resident engineer at Strahan that a 3ft. 6in. gauge with 5-chain curves to North-East Dundas would have cost three or four times that of 2-ft. gauge. (Approximate cost of Mount Lyell line, £12,000 a mile for 15 miles of 3ft. 6in. gauge, 4½ miles of which is on the rack system.)

With 2-ft. gauge no passenger platforms nor roadside accommodation required. Passengers enter carriage from permanent way.

The train should be self-contained. One carriage, about 20 feet long, to provide ladies' accommodation (same as American imported carriages). The second passenger vehicle to be guard's van, luggage, parcels, booking, and gentlemen's smoking compartment with accommodation. The two to be secured together and not reversed at terminals.

Engine should run both ways without turntable.

All rolling-stock should have continuous footboard for guard to reach engine, so that only one man necessary to work engine where possible.

Width of car to be about 5ft. 6in.; length, about 20 feet; centre buffers, continuous draw gear, automatic close couplers, and automatic brake.

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## APPENDIX D.

### REPORT BY MR. BACK WITH REFERENCE TO STATEMENTS CONTAINED IN THE ENGINEER-IN-CHIEF'S REPORT ON THE NORTH-EAST DUNDAS TRAMWAY.

Tasmanian Government Railways, General Manager's Office,
Hobart, 21st May, 1897.

Sir,

I have to thank you for perusal of the report of the Engineer-in-Chief of Victoria on the 2-ft. gauge railway now being constructed in Tasmania between Zeehan and North-East Dundas.

In complying with your request, by desire of the Premier of this colony, that I should furnish your Committee with a report on the 2-ft. gauge railway which we are constructing on the west coast of this island, nothing was further from my intention than to enter into a controversy with the Engineer-in-Chief, or any other officer of the railways in Victoria, who should be the best judges of what may be necessary in their own colony. Nor is it my intention at present to do so.

I should like to remark that the Engineer-in-Chief has stated that I have compared our 2-ft. gauge line with the Outtrim line in Victoria, and amplified this statement by a few personal remarks which I do not care to reply to. Permit me to say that I have never made any comparisons between the two lines in question, but in comparing the cost of the construction of a 2-ft. gauge line with the Victorian 5ft. 3in. standard gauge I quoted from Parliamentary Paper C. No. 3 of 1896, that the last 5ft. 3in. gauge line constructed in Victoria through very difficult country cost £10,178 per mile. On reference to my report you will observe that I did not write a single sentence, beyond the extract from the Parliamentary Paper referred to, which is simply a table of costs.

In criticising the line which the Engineer-in-Chief came to this colony to inspect, that gentleman points out, first, that the cost of the construction of 2 miles, and the attendant expenses of working same, could have been avoided by using the 3ft. 6in. gauge railway which runs from Zechan to Maestris. Here I entirely disagree. The experience I have gained in paying and receiving tolls for running over other companies lines leads me to believe that we have adopted the wiser and more economical course.

In stating that a 3ft. 6in. gauge line could have been taken through the country to North-East Dundas at very little more cost than a 2-ft., the Engineer-in-Chief is evidently writing on a mere assumption, as he has not had the opportunity of taking out the quantities, and otherwise judging the cost of such an alteration. I prefer to accept the estimates of our very competent engineers.

The Engineer-in-Chief is, I think, inconsistent when he states that by constructing a 3ft. 6in. gauge railway, with curves of 2 chains radius, a break of gauge would be avoided. On this head he writes as follows :—"Of course new rolling-stock would have been required in either case, as the English type, of which so much of the Tasmanian stock consists, would not run freely, if at all, round the $1\frac{1}{2}$ and 2 chain curves of this tramway." Introducing stock which is not uniform with the standard stock of the whole system, and which can only be used on one particular line, causes a break of gauge for all practical purposes, as all traffic would have to be transferred. Either this would be the case, or the standard of the rolling-stock generally would have to be very much lowered.

When the Engineer-in-Chief states that the 20-ton locomotive now in use on our line is about the most powerful possible for a 2-ft. gauge line, I am afraid he is giving evidence of a somewhat limited experience, as engines weighing 30 tons have been in use some years on adhesive lines of 2-ft. gauge on a grade steeper than that of the North-East Dundas line, and with curves of smaller radius.

The Engineer-in-Chief states that curves of 2 chains radius can be used on a line of a gauge of 3ft. 6in. Nobody will deny that it is possible ; but no one, I think, with any knowledge of the subject would advise such a course under conditions similar to ours. The expense and wear and tear would put it beyond practical use. I am not aware where the Engineer-in-Chief has selected his type. Possibly it may be the New York Elevated Railway. Here these curves were adopted under conditions which do not prevail in these colonies, and principally to save the enormous cost of the purchase of property and the demolishing of a large number of costly buildings.

The Engineer-in-Chief expresses the opinion that when we become duly apprised of what can be and is successfully done in working sharp curves on broader gauge lines elsewhere, we shall convert our 2-ft. gauge line into a 3ft. 6in.

I have had the opportunity of inspecting railways of various types in three parts of the world besides Australasia, and in conjunction with Mr. McCormick, the Engineer of Existing Lines in this colony, decided upon the 2-ft. gauge as the outcome of our experience and observations for many years ; and we are quite satisfied that we are proceeding in the most economical manner, and are constructing a line which will carry all the traffic required of it during probably the next twenty years.

The Engineer-in-Chief in his report has been pleased to observe that the line has been skilfully laid out ; that regard to economy of construction and workable grades and curves has been shown ; that the permanent way and works generally are of the most substantial character ; and that he believes a cheap line is justifiable under the prospective traffic conditions ; and that we have wisely left equipment to be provided when the traffic demands it. Thus practically the Engineer-in-Chief allows all we have claimed for our little line, viz., that it is well constructed, economical, and suitable for the requirements of traffic.

In fact, the Engineer-in-Chief emphasises the fact that we have opened up some of the most rugged and difficult country in the colonies in the cheapest possible manner combined with efficiency.

I have the honour to be, Sir,
Your obedient servant,

FRED. BACK,
General Manager.

The Chairman, Standing Committee on Railways,
Melbourne, Victoria.

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## APPENDIX E.

## BEECH FOREST NARROW-GAUGE RAILWAY.—REPORT BY THE ENGINEER-IN-CHIEF.

Engineer-in-Chief's Office, Railway Department,
Melbourne, 27th April, 1897.

MEMORANDUM *re* REPORT OF THE PARLIAMENTARY STANDING COMMITTEE ON RAILWAYS ON ALTERNATIVE ROUTES FOR 2-FT. GAUGE LINE, COLAC TO BEECH FOREST.

The Committee having the plans and estimates of two trial routes before them—one from Forrest to Gardiner's, the other from Colac *viâ* Lardner's Track to the same point—and having, after examination of the country and routes, selected Colac as the starting point for the line to the Beech Forest, it was not to be supposed that they disapproved of the Lardner's Track route and would favour a more direct and westerly one.

They now seem to ignore the probability of railway extensions easterly along the dividing range and southerly towards Apollo Bay, and an extension of the Forrest line being called for in a short time to serve the known good land in those directions. When these have to be provided, the 5 miles' saving in the line now recommended by them will disappear, and the ultimate cost of construction of lines will exceed that involved if the Lardner's Track route to the Beech Forest recommended by me had been adopted. (*See* plan attached.)

The present population to be served is no criterion of the merits of the routes; the chief points to consider are the extent and position of the good land to be developed and the minimum mileage and cost of lines required for that purpose.

However, it is seldom or never left to engineers to select routes for railways, and I am not at all surprised that the Committee and I differ as regards the best route for this line.

But in my opinion they are wrong in assuming that the direct line, saving 5 miles over the Lardner's Track route, will also save £24,540 in cost of construction. This is based on Mr. Surveyor Fraser's estimating, for which I accept no responsibility. I have no reason to doubt the report of Mr. District Engineer Kernot that the cost of construction from the Gellibrand River to Gardiner's by either route would be practically the same per mile, making the differences for the 5 miles about £17,500.

As regards the technical questions of proper allowance for extra length and curvature in laying out 2-ft. gauge railways, I was not aware that the Committee had formed or entertained any definite views on these points. I take it now that they desire the 2-ft. gauge lines to be laid out along any defined route regardless of extra length and curvature, the one idea being to secure the least aggregate cost of construction for the whole line. If this assumption is not correct, I shall be glad to be favoured with definite rules by the Committee for my guidance in laying out the lines.

Up to now I have simply adopted principles which are held and applied by the best authorities on railway location, and which are justified by my own experience, keeping in view a moderate traffic to be developed and the local circumstances and surroundings in each case.

I am a willing servant of the State and prepared to carry out instructions, technical or other, of any duly constituted authority in the laying out and construction of these 2-ft. gauge railways, so long as I am not held responsible for the results where my views and recommendations are ignored. I am virtually charged with the wish or motive to make these 2-ft. gauge railways a laughing-stock, a failure, or fiasco. Were I actuated by such despicable feelings, I should have advised a light rail, permitting only the lightest engine; the steepest ruling grades and sharpest possible curves for hilly country, so that only very small train loads could be hauled; the lines to meander all over the routes regardless of length and curvature, to save earthworks, &c., thus securing a minimum aggregate cost of construction—in short, railways to give a minimum of convenience to the people at a maximum of time, discomfort, and cost for carriage.

This would accord with the Machiavelian motives with which I am credited.

But what have I done? I have recommended a heavy rail, permitting the heaviest engine possible for the gauge being used; moderate ruling grades and curves and shorter lines at slightly greater cost, permitting larger loads and giving a maximum of convenience with a minimum of charges to the users of the lines.

Let any competent critics judge between me and the Committee in this matter.

F. RENNICK,
Engineer-in-Chief.

To the Honorable the Minister of Railways.

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# APPENDIX F.

## RETURN SHOWING EXPENDITURE OF LOAN FUNDS ON NEW RAILWAYS AND ON EXISTING LINES RESPECTIVELY, DURING THE YEARS 1891–2 TO 1896–7 INCLUSIVE.

VICTORIAN RAILWAYS.

RETURN showing Expenditure of Loan Funds, 1891–2 to 1896–7 (exclusive of Rolling-stock and Preliminary Surveys).

| Year. | New Lines, including Cost of Surveys. | Existing Lines, including Cost of Completion of Lines under Act 821.* | Total. |
|---|---|---|---|
| | £ | £ | £ |
| 1891–2 ... ... ... ... | 17,225 | 439,758 | 456,983 |
| 1892–3 ... ... ... ... | 75,312 | 207,311 | 282,623 |
| 1893–4 ... ... ... ... | 157,533 | 92,936 | 250,469 |
| 1894–5 ... ... ... ... | 90,638 | 92,643 | 183,281 |
| 1895–6 ... ... ... ... | 61,715 | 97,868 | 159,583 |
| 1896–7 ... ... ... ... | 15,422 | 104,004 | 119,426 |
| | 417,845 | 1,034,520 | 1,452,365 |
| *Less approximate cost of completing lines under Act 821 (*see* Note) ... ... | ... | 255,000 | |
| Total expenditure of Loan Funds on existing lines, 1891–2 to 1896–7 ... ... | ... | 779,520 | |

* NOTE.—Approximately there has been £255,000 expended for the completion of lines constructed under Act 821 for years 1891–2 to 1896–7, including the Neerim South extension, Sale to Canal, Flinders-street viaduct, and new railway offices, &c., authorized under Railway Loan Application Acts. This amount should be deducted to arrive at the amount expended on capital account on existing lines of railway for the period named, which may be therefore stated as £779,520.

R. SINGLETON,
Accountant.

Accountant's Branch, 9th July, 1897.

# APPENDIX G.

## RETURN SHOWING ITEMS OF EXPENDITURE ON EXISTING LINES CHARGED PARTLY TO CAPITAL AND PARTLY TO REVENUE.

VICTORIAN RAILWAYS.

| Work. | Capital. | Revenue. | Total. | Remarks. |
|---|---|---|---|---|
| | £ s. d. | £ s. d. | £ s. d. | |
| YEAR 1892–3 ... ... | ... | ... | Nil | |
| YEAR 1893–4. | | | | |
| Yarraville, brick closets and urinals | 195 0 0 | 45 0 0 | 240 0 0 | Replacing wooden building by brick one |
| Dandenong and Leongatha line, removing and burning off trees | 25 0 0 | 9 4 3 | 34 4 3 | Completing work of construction |
| Pyalong, altering position of portable houses and placing together for accommodation for woman in charge | 7 13 4 | 15 6 8 | 23 0 0 | Removal and re-erection of and additions to spare buildings |
| Oakleigh, renewing "down" platform in brick | 112 10 0 | 337 10 0 | 450 0 0 | Original work was timber |
| Total for 1893–4 ... | 340 3 4 | 407 0 11 | 747 4 3 | |
| YEAR 1894–5. | | | | |
| Newport shops, 25-cwt. hammer, forge, and shed | 175 0 0 | 175 0 0 | 350 0 0 | Removal and re-erection of spare hammer from Williamstown |
| Oakleigh, renewing "up" platform in brick | 107 0 0 | 322 0 0 | 429 0 0 | Original work was timber |
| Reconstruction of bridge over Avon River at Bushy Park | 8,000 0 0 | 2,000 0 0 | 10,000 0 0 | Bridge with brick piers and steel girders in place of timber structure |
| East Brighton, South Brighton, and North-road brick platform walls, "up" side | 115 12 6 | 346 17 6 | 462 10 0 | Original work was timber |
| Total for 1894–5 ... | 8,397 12 6 | 2,843 17 6 | 11,241 10 0 | |
| YEAR 1895–6. | | | | |
| Little River, erection of windmill removed from Stoney ford | 25 0 0 | 5 0 0 | 30 0 0 | Removal and re-erection of spare windmill. Renewal work charged to Revenue |
| Melbourne (Spencer-street) goods yard, alterations of lines | 1,440 0 0 | 800 0 0 | 2,240 0 0 | New work charged to Capital. Renewals to Revenue |
| Glenthompson, water supply works | 100 0 0 | 100 0 0 | 200 0 0 | Removal and re-erection of spare materials |
| Prahran station buildings, "down" side | 400 0 0 | 200 0 0 | 600 0 0 | Brick building in place of wooden one |
| Mentone platform, bluestone coping | 16 13 4 | 33 6 8 | 50 0 0 | Original work was timber |
| Melbourne Railway reserve, Adderley and Dudley streets, picket fence to replace post and rail | 85 0 0 | 43 0 0 | 128 0 0 | Explains itself |
| Melbourne, Dudley-street bridge | 15,500 0 0 | 1,500 0 0 | 17,000 0 0 | Original bridge was timber; new one brick, with steel girders |
| Balaclava, timber ramp approaches and buildings | 1,300 0 0 | 200 0 0 | 1,500 0 0 | New buildings and ramp approaches, in place of steps |
| Spencer-street, renewing 380 l.f. "main" arrival platform in brick | 82 0 10 | 246 2 8 | 328 3 6 | Original work was timber |
| Werribee, station re-arrangements | 1,247 0 0 | 1,103 0 0 | 2,350 0 0 | New work charged to Capital. Renewals to Revenue |
| North Brighton, "down" platform, brick station buildings | 300 0 0 | 200 0 0 | 500 0 0 | Brick building in place of wooden one |
| Murrumbeena, extension platforms, alterations, &c., station buildings, and removal of goods siding | 87 0 0 | 87 0 0 | 174 0 0 | New work charged to Capital. Renewals to Revenue |
| Box Hill, erecting turntable, &c. | 138 0 0 | 92 0 0 | 230 0 0 | Removing and re-erecting spare turntable. Renewal work charged to Revenue |
| Spencer-street, alterations pig loading dock platform | 129 0 0 | 11 0 0 | 140 0 0 | New work charged to Capital. Renewals to Revenue |

RETURN SHOWING ITEMS OF EXPENDITURE ON EXISTING LINES CHARGED PARTLY TO CAPITAL AND PARTLY TO REVENUE—*continued.*

| Work. | Capital. | | | Revenue. | | | Total. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| | £ | *s.* | *d.* | £ | *s.* | *d.* | £ | *s.* | *d.* | |
| Yarragon, station-master's residence | 43 | 6 | 8 | 86 | 13 | 4 | 130 | 0 | 0 | Removal and re-erection, with additions, of spare buildings. Renewal work charged to Revenue |
| Elsternwick, erection of brick station buildings | 800 | 0 | 0 | 200 | 0 | 0 | 1,000 | 0 | 0 | Brick buildings in place of wooden ones |
| Burnley, Swan-street, level crossing, signal box, interlocking | 517 | 0 | 0 | 103 | 0 | 0 | 620 | 0 | 0 | New work charged to Capital. Renewals to Revenue |
| Elaine, new brick platform ... | 100 | 0 | 0 | 300 | 0 | 0 | 400 | 0 | 0 | Original work was timber |
| Narre Warren, renewing platform in brick | 40 | 0 | 0 | 120 | 0 | 0 | 160 | 0 | 0 | Original work was timber |
| Lancefield Junction, new stone platform facing | 35 | 12 | 6 | 106 | 17 | 6 | 142 | 10 | 0 | Original work was timber |
| Korumburra (near), residence for ganger | 40 | 0 | 0 | 20 | 0 | 0 | 60 | 0 | 0 | Removal and re-erection, with additions, of spare building |
| Stratford, bridge over Avon River | 7,000 | 0 | 0 | 450 | 0 | 0 | 7,450 | 0 | 0 | Bridge with brick piers and steel girders, in place of timber structure |
| Glenrowan, ganger's residence | 20 | 0 | 0 | 10 | 0 | 0 | 30 | 0 | 0 | Removal and re-erection, with additions, of spare building |
| Beechworth, station-master's residence | 110 | 0 | 0 | 20 | 0 | 0 | 130 | 0 | 0 | Removal and re-erection, with additions, of spare building |
| Total for 1895–6 ... | 29,555 | 13 | 4 | 6,037 | 0 | 2 | 35,592 | 13 | 6 | |

# APPENDIX H.

## STATEMENT SHOWING APPROXIMATELY THE AMOUNT OF LOAN MONEYS AVAILABLE FOR CONSTRUCTION OF NEW RAILWAYS AND ROLLING-STOCK AT 30TH JUNE, 1897.

VICTORIAN RAILWAYS.

| | | | |
|---|---|---|---|
| Cash available as per Treasury Return of 7th July, 1897 ... ... ... ... | | £707,495 | |
| *Add* Advance to Stores Suspense Account ... ... ... ... | | 40,000 | |
| | | | £747,495 |
| *Commitments.* | | | |
| Less unexpended balance of amount authorized under Act 1437 ... ... | £214,000 | | |
| *Less* estimated saving ... ... ... ... ... ... | 9,000 | | |
| | | £205,000 | |
| Less unexpended balance of amount authorized under Act 1470 ... ... ... | | 167,000 | |
| | | 372,000 | |
| *Liabilities at 30th June*, 1897. | | | |
| Mallee and Coal Lines ... ... ... ... ... ... | £30,000 | | |
| Land Account—Lines under Act 821 ... ... ... ... ... | 10,000 | | |
| Rolling-stock, &c., Act 1451 ... ... ... ... ... ... | 39,000 | | |
| | | 79,000 | |
| | | | 451,000* |
| | | | £296,495 |
| Government Debentures and Stock not yet issued, as per Treasury Return 7th July, 1897— | | | |
| Act No. 1296 ... ... ... ... ... ... ... ... | | £535,328 | |
| Act No. 1468 ... ... ... ... ... ... ... ... | | 171,922 | |
| | | | 707,250 |
| Total ... ... ... ... ... ... ... ... | | | £1,003,745 |

Of this amount £449,000 is exclusively for rolling-stock.

* This does not include any provision for preliminary surveys, of which £3,500 has been expended out of Treasurer's advance.

Accountant's Branch, 9th July, 1897. R. SINGLETON, Accountant.

# APPENDIX I.

## RETURN SHOWING THE TOTAL AMOUNTS SPENT ON SURVEYS OF LINES (WHETHER AFTERWARDS CONSTRUCTED OR NOT) DURING THE YEARS 1891–2 TO 1896–7.

| 1891-2. | 1892-3. | 1893-4. | 1894-5. | 1895-6. | 1896-7. | Total. |
|---|---|---|---|---|---|---|
| £21,056 ... | £29,205 ... | £7,283 ... | £7,566 ... | £5,240 ... | £11,188 ... | £81,538 |

During the above period 1,003 miles of line were surveyed.

Victorian Railways, Commissioner's Office.

By Authority: ROBT. S. BRAIN, Government Printer, Melbourne.