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T A S M A N I A.

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**MR. TULLY'S REPORT ON PROPOSED HUON  
TRAMWAY.**

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Laid on the Table by Mr. Henty, and ordered by the Council to be printed,  
22 July, 1862.



*Survey Office, 7th July, 1862.*

SIR,

I HAVE the honor to transmit herewith a Report on the proposed Huon Tramways, in connection with the Surveys effected under the authority of Parliament; together with the Plans and Estimates I have prepared to illustrate their construction.

The question of the introduction of a system of Tramroads into general use is so important that I have endeavored to furnish as large an amount of information as possible with regard to all matters bearing on the subject; and have also included some practical observations, which I trust may be found useful to Parliament in dealing with the question.

I have the honor to be,  
Sir,

Your very obedient Servant,

W. ALCOCK TULLY, *Inspecting Surveyor.*

J. E. CALDER, *Esq., Surveyor-General.*

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## R E P O R T.

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IN drawing up this Report, I have considered it desirable to adopt an arrangement by which each branch of the subject may be separately treated. I propose, therefore, to deal with the following questions in the order set below :—

- I. Advantages of Tramways over common Roads.
- II. The Construction and Cost of the proposed Lines.
- III. Influence of Tramways on Trade, and Sale of Crown Lands.
- IV. Proposed Scheme of Management.
- V. Practical Suggestions and Observations.

### I. ADVANTAGES OF TRAMWAYS OVER COMMON ROADS.

Before entering on the immediate subject of this branch of the Report, it will not be out of place to give a general sketch of the Road communication in the Huon District, and to consider the retarding effect which the want of a proper Road system exercises on the progress of settlement in that portion of the Island.

It has been only of late years that Roads have been used for either the transport of produce or timber. In the earlier stage of settlement, the frontages on the river or coast were solely occupied, and clearings made within a short distance of the water. Timber was so abundant near the coast that the splitters and sawyers carried down the produce of their own labor to the jetty or shipping-place. But this state of things underwent a change as soon as the more conveniently-situated forests were worked out, and Roads were obliged to be resorted to. The direction of the Roads thus rendered necessary depended more on the beds of timber they were intended to open up than the features of the country. As a general rule, they were cleared at different periods, to meet special

exigencies. Their route was chosen solely with the view of saving labor in constructing them, so that every addition caused a more considerable deviation from the original direction. These makeshift Roads usually pass through dense forests, which, both on account of the prevailing moisture at all seasons and the large proportion of vegetable matter in the soil, are ill adapted for Road-making. During the greater portion of the year they are in a soft boggy state, and at all times unsuited for heavy loads. High charges for the carriage of produce and timber have become general wherever Roads such as I have described have to be resorted to; and the pressure in some localities has been so great on those who have been obliged to use them, that all who could manage to leave have sought a livelihood elsewhere.

In all directions the same complaint is urged,—that the badness of the Roads absorbs the fruits of industry, and that the charge for transport is more than the present reduced prices for both timber and produce can afford to pay. Some propose a remedy in improving and repairing the existing lines; but this is both difficult and expensive. The cost of constructing a good Road would be enormous; and any improvement that might be possible, with even a considerable outlay, would only be temporary.

Tramroads offer many advantages, both for their comparative cheapness of construction and the facilities they afford for transporting heavy loads. There is no question as to their superiority over common Roads in a District where timber abounds; in fact they are both cheaper and thrice as effective, with the same working strength. It is easy to establish an exact comparison. The actual cost of a macadamised Road in a country favorable for Road-making is usually considered £1000 per mile. I shall show hereafter that the cost of a Tramway, with plant, jetties, &c., will not exceed £638 per mile,—so that the latter possesses the advantage of cheapness of construction. On a Tramway four miles in length five horses will bring down twenty-five tons of lumber each day from the extremity of the line, without any of their loads exceeding two tons and a half, which is a low estimate for a Tramway. This weight represents about ten thousand box palings, which could not be carried on a macadamised Road at a sum less, for the distance above specified, than 2s. per hundred. On a Tramway, the cost would be 1s. 5d., according to the scale I have appended. The cost of transport for ten tons by the Road would be £10;—by the Tramway £7 1s. 8d.; so that, allowing the lowest rate at which the weight could be carried on the Road, there is a balance of 28 per cent. in favor of the Tramway, besides the smaller working expenses, as it would be manifestly impossible for five horses to perform the work in the same time on an ordinary Road; indeed it would require twelve horses to bring down daily the same weight.

I have instituted this comparison with macadamised Roads in order that the advantages in favor of the former might be made more intelligible, and that there should be a certain basis from which to deduce the results. But when the high rates charged for short distances on the existing bush Roads are contrasted with those of the Tramway, the advantages of the proposed system are more easily realised. In the first comparison, I was desirous to establish the fact that Tramways are both cheaper and more economical in working, than macadamised Roads. In the second, I shall show the great superiority they possess over the Roads of the District, and the large saving of labor their adoption will effect amongst the splitting branch of the population. In the Port of Esperance, the cartage of palings for about two miles is charged at the rate of from 1s. 6d. to 1s. 9d. per hundred; which is equivalent to 17s. 6d. per 1000, or 7s. per ton. For two miles on a Tramway the cost would be 8d. per hundred, or 2s. 8d. per ton; a difference in favor of the latter of 162 per cent. Additional advantages will be derived by the Tramway providing a means of communication with valuable beds of timber now beyond the reach of the splitter, and placing the latter in a position where his labor will be more effective by the abundance of material within a short distance of the line. Supposing he had to pay equally high rates for the carriage of palings or other stuff, he would still be a gainer; as, from what I can learn, one third of his time is now occupied in carrying down the produce of his labor to the head of the cart Roads. Generally, throughout the Huon, it takes a man a day to carry 200 palings the distance of one mile, and so on in proportion. This loss of time, added to cartage and freight, leaves but a small balance for the splitter, who is often dependent on a mere pittance for his support.

A Return, kindly favored by Mr. Daldy, of the quantity of timber exported from the Bay during the last twelve months, combined with information obtained from other sources, has enabled me to furnish the following items in connection with the trade:—

Total value of timber exported during 12 months, exclusive		£	
of that cut at Strathblane Saw Mill .....		7,600	
Freight.....	1,150	} £2,850	Deduct.... 2,850
Cartage .....	1,700		
Value of timber at the stump .....		£4,750	

From this, it appears that the cartage amounts to about 35 per cent. of the actual value of the timber at the stump. The number of men working in the Bay amounts to 80; so that the balance above computed gives an average income of about £59 per annum to each individual engaged in cutting timber for the market. From my own knowledge, I am satisfied that this amount is as nearly correct as possible.

## II. THE CONSTRUCTION AND COST OF THE PROPOSED LINES.

The surveys effected in accordance with the Parliamentary grant of last Session have been mainly confined to the country extending from Hospital Bay to Southport, a distance of about 22 miles. The reasons which induced the selection of this locality were based on the fact that a larger area of Crown Land, easily accessible, existed between the points referred to than in any other part of the District; and it was well known that valuable forests extended over the greater portion of the tract. The most valuable information has been obtained on this point, as may be seen by an inspection of the appended Reports. The country was subjected to as complete an examination as the season permitted. Tracks were cut in various directions before the Tramway lines were marked out; and every care was taken to utilise the projected works by bringing within their influence as large an extent of timbered land as possible. The three lines already marked out will open up an aggregate area of 16,000 acres of virgin forest, containing timber of the largest size and finest quality. There are other localities in which equally valuable beds of timber abound, and which could be rendered available by short branches from the main lines of Tramway.

The three lines above alluded to were intended to connect Southport and the River Huon with Port Esperance. Two of them have been marked out between the latter place and Southport, with one terminus as the northern end, and diverging considerably so as to open up the large extent of Crown Land between the two places, which could not be effected by a single line. The third extends about three miles in the direction of Flight's Bay along the valley of the Dover Rivulet, at which the principal settlement at Port Esperance is situated.

Tramway (A.) starts from a point on the Narrows at Esperance easily accessible to vessels, where an inexpensive jetty would supply every required convenience for loading. There are no engineering difficulties in this line, which is carried through a country comparatively level, and at a small elevation above the sea. Some of the curves, in consequence of the steepness of the gullies, are of shorter radius than might be desired; but no practical inconvenience or risk will be experienced, as it is not, I apprehend, intended that a higher rate of speed than 3 or 4 miles an hour should be attained. The terminus at the Southport end was the subject of grave consideration, as the fact of the harbor being exposed to the south east wind on its northern shore was well established. The shallowness of the water, and the exposure to which vessels would be subjected, induced me to direct the Surveyor to carry the Tramway across the mouth of the Narrows—which is about 347 feet in width at its narrowest part,—to a point on the south shore immediately south of Pelican Island, where there is 18 feet of water at 100 feet distance from the bank. The greater depth of water at this side of the Bay, as well as the shelter it affords at all weathers, gives it a decided advantage over the opposite side; and should the timber trade be increased, the importance of being able to ship cargoes safely and speedily cannot be too highly rated. The only objection to the adoption of this plan is the necessity of building a bridge across the Narrows; but as there is an abundance of timber within a short distance, and the Tramway could render valuable assistance in bringing it to the work, I do not estimate the cost at more than £500.

The conclusions I have drawn with regard to this proposed route apply more to Tramway (B.), to which I shall draw attention hereafter, as it was intended that both Tramways should unite at a point close to Southport; but, since the issue of my first instruction, I have been induced to delay the marking of Tramway (A.) to the mouth of the Narrows, owing to the unfavorable nature of the country and the more expensive character of the work. Should the plan I have suggested be approved of, the line can be easily connected with Tramway (B.); but, for the present, I have decided on bringing it to a point at the head of the Narrows, to which small crafts can be navigated.

Tramway (B.) starts from a point on Tramway (A.) about two miles from the Esperance terminus, and traverses the country to the eastward of the Southport Road, which is perhaps one of the most heavily timbered Districts of the Colony. It passes for six miles through dense forest land abounding in every variety of trees suitable for splitting and other purposes, and was intended to form a junction with Tramway (A.) on the Township of Hythe, so that one terminus would serve both lines at each end. This line has been marked out to the point at the Narrows selected for the Bridge; but the connection with (A.), as already stated, has not been established. The sections of the above lines not having been completed, I am unable to afford any specific information as to the general character of the gradients, further than an opinion based on personal knowledge of the country that they will be easy, and in all cases practicable.

Three miles of Tramway (C.) have been marked out in the direction of the valley of the Dover Rivulet, towards Flight's Bay. This line, so far as it extends, passes over a country on which first class gradients can be obtained, and will connect a large extent of land of superior quality with the shipping-place at Esperance.

The total length of the three lines above described is about 23 miles; viz.—

Tramway A.....	10 miles.
Tramway B.....	10 miles.
Tramway C.....	3 miles.

The cost of construction will be very much dependent on the character of the gradients. In drawing up the following estimate, I have adopted the cheapest form of line, by using the natural surface of the ground in all cases where practicable. The items given below will be found to include every source of expense, and to be sufficiently ample for the purpose :—

	£
Land and Compensation .....	250
Contract works .....	9,910
Best timber for Rails.....	1,500
Station Offices.....	300
Waggons.....	1,025
Engineering and Survey .....	600
Jetties .....	500
Sundries.....	600
	<hr/>
	£14,685
	<hr/>

This list of items gives a total sum of £13,665 for the construction of 23 miles of Tramway, which is equivalent to £594 per mile.

In determining the manner in which the proposed lines ought to be constructed, I have endeavored to secure the greatest durability with the least cost. Every portion of the work has been designed in reference to the special requirements of the District through which the lines pass. Having had an opportunity of seeing the several Tramways in both the north and south side of the Colony, and of comparing their several modes of construction, I have tried to avoid what is faulty in each, and to gain a greater strength and permanence, by applying the materials in the manner best calculated to preserve them.

In many of the lines, the wear and tear is immense, and the repairs constant. This, of course, in the case of wooden rails, is proportionate to the steepness of the gradients, and the weight of the waggons; but this may be reduced by constructing the works more permanently, so that the wear and tear should be confined to the rail, which can easily be replaced when there is occasion. The most usual mode of laying the permanent way is to have the rails resting on transverse sleepers, to which they are fastened by either treenails or wedges. This method is the one generally adopted on the Railways in England; but, in order to ensure a perfect stability where the bearings are only on the sleepers,—about 3 feet apart,—a system of ballasting is required, which is one of the most expensive portions of the work. In a Tramway, this might be dispensed with, on account of the smaller weight carried, if the ground was hard and unyielding: but this condition is essential if permanence is required.

In the heavily timbered Districts, the soil is soft and mainly composed of vegetable matter. I have therefore found it necessary to devise some other method by which stability may be secured without having recourse to the expensive process of ballasting. The plan I have adopted possesses the advantage of having a continuous bearing for the longitudinal sleepers, under which, at ten feet apart, the cross-sleepers are bedded some few inches below the soft soil. By this means, the sinking of any portion of the surface-soil will not affect the sleepers, or exercise an undue strain at any one point. Where practicable, the longitudinal logs will rest on the ground, and will be tied together by the cross-sleepers above referred to, so that each length of ten feet will form a perfect frame lying with equal pressure on all its parts.

In the transverse method of laying the rails, the subsidence of any one of the sleepers, which in a soft soil (as it is dependent on its own individual support,) may be reasonably calculated on, would dislocate the fittings immediately about the weak point, and the whole structure would soon become loosened and unfitted for use. I cannot too highly impress the importance of having an unyielding basis on which to rest the rails, more particularly as every advantage will be taken to follow the natural surface.

Plan No. 5, accompanying this Report, exhibits the mode of construction, which is a modification of that adopted by Mr. Chapman at the Strathblane Saw Mill, and has been found to endure the heaviest work without showing any sign of weakness. The travelling path between the rails has been raised from the ground by small logs, on which split slabs are laid across, so as to provide a dry and smooth footing for the animals drawing the waggons. The expense incurred by the additional work required for the pathway will be extremely trifling, as all the timber required for the purpose can be obtained from the land, and the fittings are so simple that ordinary bushmen could undertake the work with proper superintendence. The advantage of having a dry track to work the waggons will more than compensate for the additional outlay; and the arrangement has this farther advantage of being disconnected with the sleepers, and can be repaired without any disturbance of the latter. I do not believe any other mode of construction that I have seen would be found to answer so well for the country through which the proposed Tramways are carried, and none that I am aware of possess equal stability and permanence.

Plan No. 6 exhibits the manner of raising the line, where the inequalities of the ground are such as to preclude the possibility of following the natural surface. The piers of cross logs, on which the longitudinal beams rest, are known as “pig-sties.” It is by far the cheapest mode of construction, and will occasionally be resorted to in order to save the cost of excavation. The cost of raising each “pig-stye,” formed of logs 12 feet by 10 feet, is about 3s. per foot up to 4 feet in height, and 2s. 6d. for each additional foot. The maximum height to which it would be prudent to carry them ought not to exceed 9 or 10 feet; but, without exceeding this limit, good gradients can be obtained, and excavation is avoided, except in some trifling cases.

The Bridges, with the exception of the one crossing the Southport Narrows and the 1st and 2nd in Tramway (A.), are mere modifications of the erections above described, in which the longitudinal beams will be stronger in proportion to the span, and, where

necessary, supported on trusses. It would scarcely be within the limit of a Report to describe the details of each erection. I have done so with respect to the more important portions of the work, in order that the method adopted might be well understood.

### III. INFLUENCE OF TRAMWAYS ON TRADE, AND SALE OF CROWN LANDS.

In a former part of this Report I alluded to the advantages the splitting and sawing branch of the population would enjoy by the construction of Tramways, which in itself would re-act on the commercial classes as well as the State, by giving larger means to the consumer. In other respects, a greater benefit will accrue to the Colony by opening up the rich forests of the south, which are in themselves a source of wealth. It is not by the actual sale of timber that the Colony will be benefitted at first, but more by the unfolding of its resources. At the point of establishing a reputation in Europe for our native woods, it cannot be too strongly impressed on the public mind that the value of the timber and the high character it may bear will be of little use if there is no access to the large stores which nature has supplied. It will be the best assurance of our own faith in the article to undertake works calculated to promote and assist trade, and to be ready to supply any demand that may arise. It is generally believed that the day is not far distant when a profitable trade will be maintained with Europe or India in supplying Railway sleepers, for which the hardwood of the Colony is admirably suited. The late notice from an Indian Company inviting tenders for sleepers affords an index of what the trade might become if fostered by a wise expenditure in improving the means of transport. The cost of production of the article in India would afford an ample margin of profit in this Colony, including the freight, if the timber could be readily drawn from the bush. Under present circumstances, it would be manifestly impossible to undertake any large contract, except at rates that tend to drive trade away. Every facility in shipping and transporting the article will secure an increase of business, by reducing the cost of production, and, what is of equal consequence, rendering the due fulfilment of a contract certain.

For the heaviest description of timber, this Colony will always maintain a pre-eminence. The ships' knees, keels, and planking of unrivalled quality—of which a sample has been forwarded to the Exhibition now open in London—will one day or other excite attention. These articles, the most valuable and reproductive, are more dependent on Tramways than the smaller lumber now exported. There are very few places in the Island, if any, that could supply, without the assistance of Tramways, any large order for the heavier sorts of timber; and this is the special trade it is sought to stimulate by the exhibition of the native woods, and by a description of their size and suitability for all purposes requiring strength and permanence.

I am aware that several trials made by some of our spirited Colonists to establish a trade in timber with home failed; but every step in reducing the cost of production brings the loss to a lower figure until the confidence, which experience of the wood gives, secures it a prominent place in the market. This must be a growth, as it is well known that timber, however good, will not be esteemed unless used or recommended by the principal firms in the trade. The Colonial testimonials as to the value and durability of the timber are not readily accepted at home. The most attractive inducement is cheapness, and this is only effected by the adoption of the most perfect means of transport within reach.

In the ordinary products of the forests of the south side of the Island, the benefits derived by the construction of Tramroads are not so conjectural as in the case above described. It is easy to trace the special causes that tend to enervate the timber trade, and bring into disrepute some of the staple exports of Hobart Town. The practices adopted in procuring timber for the market are the natural consequences of a system that can never cure itself. The necessities of the splitter and sawyer are too urgent to allow them to follow any course but that which offers the readiest means of making a living. Their object is to gain the most in the least possible time, without reference to the quality of the article produced. It is easy to understand that, when a long distance intervened between the Roadway and the stump, the size of the palings were proportioned to the distance, so that the number carried out might represent, if possible, an equal value with

those of a larger size. By no practicable means could this class gain by supplying a superior article; their interest lay in providing an inferior one, which, under the usual circumstances, became worse and worse as the trees became more scarce and remote.

This special feature in the practice of the woodmen of the south caused also a large waste of timber, as it is well known that much fewer trees are found to split into the lighter form of paling than into the heavier sort, known as "box." Many trees will turn out box palings that are now left standing within a convenient distance of the Roadway; but this form of paling is not popular, owing to the amount of labor involved in carrying it out. In this respect, the construction of Tramways will prove a gain. The interests of the splitter will not clash with those of the trade, and he would be in a position to furnish a better article and enjoy a higher rate of remuneration.

Before concluding this branch of the subject, I must not pass over the effect which the proposed Tramways will have on the sale of Crown Lands without some remark. I am aware that the more immediate object of the system is to assist the timber trade; but, in the Huon District, the land and timber are so identified, that it will not be out of place to couple them and trace the effect on each. I am happy to be enabled to report that a growing desire has been evinced on the part of the splitters and sawyers to purchase a plot of land for their own use, and work the available timber on it. These men now find the advantage of securing a selection, which their own improvements make more valuable from year to year, and which enables them to establish a permanent home for themselves and their families. In this way, I foresee that a very considerable amount of land may be expected to be taken up.

The progress of settlement at the Huon has been slow up to the present period. The Statistics of the Colony for the last five years exhibit the fact, that there is less land under cultivation there than in any other District in the Island. The cause of this is easily determined, and may be imputed to two features, one of which the proposed system of Tramways will tend to remedy. The expense of clearing the land, and the difficulty of bringing down the produce to the coast, have both discouraged settlement, and have limited farming operations to the smallest scale in the most favored spots. As a rule, the generality of land fit for cultivation lies back from the coast line, and the most important question in clearing ground is to have a good Road to the water; but, owing to the continual dampness of the climate and the nature of the soil, this valuable adjunct to the farmer is seldom enjoyed. What the Tramway is to the splitter and sawyer, so will it be to the settler. It will prove a more able assistant to him than any other scheme that could be devised, and is well adapted to the circumstances of those who settle on the land with limited means.

I have not space to adduce an estimate of the actual benefit accruing to the agriculturalist by the adoption of the system of Tramways; but I am assured that, by the greater saving in transport, and the lesser capital required in working strength, the position of the settler would be much improved, and, as far as I can see, the advantages enjoyed would be equivalent to a saving of £50 per cent. in the clearing of the land,—which is an important reduction in an outlay which deters, by its magnitude, any person of capital from investing it on land.

In the concluding portion of this Report, I shall have occasion to draw attention to a scheme of disposing of the Waste Lands, which I am confident will be productive of much benefit to the working man.

#### IV. PROPOSED SCHEME OF MANAGEMENT.

The management of the Tramways, and the rules under which the lines are to be worked, together with the legislative enactments to protect public and private interests, involve considerations so important that I deem them worthy of a special branch in this Report. I shall only attempt an outline of what seems to me to offer the combined advantages of economy and simplicity of working, as I feel a considerable amount of diffidence in adducing views for which I have no particular precedent, and for which, owing to the dearth of authorities in the Colony, I was unable to find one. It is a branch



of the subject which especially belongs to Parliament; but I feel that the following suggestions will prove useful in connection with future inquiries and deliberations on the same subject.

Tramways may be divided into two classes—those constructed by a Parliamentary grant, and those by private companies with a Government guarantee. In the former, the arrangements and scheme of management would be regulated by Parliament; in the latter, some restrictions on the action of the projectors would be all that is required.

In the event of Parliament authorising the construction of Tramways, some legislation on the subject will be necessary to determine the general principles on which the lines shall be worked, and to give power to the Governor to frame regulations for the purpose. The effect which the proposed system will exert on the Crown Lands in the District will also require to be taken into consideration, and some modification of *The Waste Lands Act* introduced, so that the Colony may reap the largest benefit by the increased value of the public estate. I shall have occasion to allude to the latter subject hereafter; I shall therefore confine myself at present to the development of the most suitable scheme of management, and the tariff of charges for the transport of goods along the line.

I think, in the case of Tramways of the 1st class, that the lines should be leased, as there are so many objections to the Government undertaking the work. The greater reason therefore exists for definite rules to apply in each instance, so that no misconception may arise hereafter, and that there may be less scope for favoritism or exorbitant charges. The following Scheme possesses the advantage of being easily worked, and being equally adjusted to the interests of the Lessee and the public using the line:—

1. Tenders should be publicly invited for the renting of each of the Tramways.
2. Lease to extend over a period of four years, and to be subject to Regulations framed by Governor in Council, and to fixed charges for the carriage of goods.
3. Sureties to be required for the due maintenance of the line, the fulfilment of all the required conditions, and the delivery of all plant in fair order on the termination of the term of lease.
4. The rent to be paid in advance.
5. A Local Board, comprised of three or four persons not connected with the timber trade, to be appointed to supervise, and report on at stated periods, the condition of the works; and also to transmit to the Government, for publication, a Return showing the quantity of timber or other produce brought down, the receipts of the line, and any further information the Board may deem useful.
6. The Board shall have power to inquire into all differences between the Lessee and the public using the line, and to decide on the merits of the case in reference to the Working Regulations.
7. The Lessee shall have the option of charging equivalent rates for weight, instead of the usual measurement or quantity, provided that he erects a properly adjusted and approved weigh-bridge for the purpose.
8. The Lessee shall be bound to supply the Local Board with the amount of each month's traffic, detailing the quantities of each description of produce carried down.
9. The Lessee shall be required to keep the scrub or other inflammable rubbish cleared away on both sides of the Tramway to a distance of fifty feet; and, if any neglect in this particular is noticeable, the Local Board shall be empowered to hire the necessary labor to clear the line, the expense of which shall be charged to the Lessee.
10. Persons clearing land on the frontage of the Tramway shall be responsible for all damage caused by fire; and shall, in all cases, be required to give notice of their intention to burn off.
11. Persons felling timber in the vicinity of the lines shall be responsible for all

damage which neglect or carelessness may have caused by the falling of trees across the Tramroad ; and the amount of injury shall be chargeable to the person or persons so offending, and may be recovered by Information.

In the case of Tramways of the 2nd class, similar enactments will be required for the maintenance of the line, and protection against fire ; but the principles, on which the lines shall be worked, would be decided by the projectors, subject to the approval of Parliament.

The lines would require to be furnished with one light timber waggon for each mile of Tramway opened, and a heavy waggon for general purposes. This would, I believe, be found sufficient for all ordinary work ; but, in case the traffic should increase, the Lessee would have to provide additional means of transport. The heavy timber waggons would cost about £40, and the others about £35.

I propose to establish offsets on the Tramways, about a mile apart, on which the waggons can be drawn aside for the convenience of loading, as well as to maintain an uninterrupted traffic on the lines.

I subjoin the following tariff of the rates of carriage for timber and produce for distances extending to four miles and upwards. I have only enumerated the articles I have considered likely to be produced in the District, and have assigned to each class of goods a fixed rate, which will well remunerate the Lessee, presuming that a fair amount of work is done. Four waggons, travelling with loads 10 miles a day each, would give a daily receipt of £10, or £3000 per annum ; and, estimating the daily working expenses at the following charges, an ample margin of profit is reserved for the Lessee,—

	£	s.	d.
4 Drivers, at 6s. per diem.....	1	4	0
4 Laborers, at 5s. per diem.....	1	0	0
Forage .....	0	12	0
Clerk .....	0	10	0
Manager.....	0	15	0
Wear and tear, rent, &c.....	2	0	0
	<u>£6</u>	<u>1</u>	<u>0</u>

*ABSTRACT' of proposed RATES per Mile for Carriage of Timber and other Produce.*

	FIRST MILE.		SECOND MILE.		THIRD MILE.		FOURTH MILE, AND UPWARDS.	
	Per 100.	Per Ton.	Per 100.	Per Ton.	Per 100.	Per Ton.	Per 100.	Per Ton.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
5-feet Palings, market .....	0 5	2 0	0 3	1 4	0 3	1 4	0 2	1 0
ditto, box.....	0 6	2 0	0 4	1 4	0 4	1 4	0 3	1 0
6 ditto, market .....	0 7	2 0	0 5	1 4	0 5	1 4	0 4	1 0
ditto, box.....	0 8	2 0	0 6	1 4	0 6	1 4	0 5	1 0
Shingles, per 1000 .....	0 5	2 0	0 3	1 4	0 3	1 4	0 3	1 4
Laths, ditto.....	0 5	2 0	0 3	1 4	0 3	1 4	0 3	1 4
Posts and Rails .....	3 6	2 0	3 0	1 4	3 0	1 4	3 0	1 4
Staves .....	4 0	2 0	3 6	1 4	3 6	1 4	3 6	1 4
Sawn Timber, under 10-feet lengths ..	0 6½	2 0	0 4	1 4	0 4	1 4	0 4	1 4
ditto, above 10-feet.....	0 7½	2 6	0 5	1 8	0 5	1 8	0 5	1 8
Piles, per foot.....	0 1	..	0 1	..	0 1	..	0 1	..
Logs and Beams.....	..	2 6	..	2 0	..	2 0	..	2 0
Firewood.....	..	2 0	..	1 4	..	1 4	..	1 4
Bark .....	..	2 6	..	1 8	..	1 8	..	1 8
Felloes .....	0 3	..	0 2	..	0 2	..	0 2	..
Railway Sleepers .....	24 0	or 3d.	each	per	mile.	..	..	..
Bricks, per 1000 .....	4 0	..	3 0	..	3 0	..	3 0	..
Manure.....	..	2 6	..	2 0	..	2 0	..	2 0
Stone.....	..	2 6	..	2 0	..	2 0	..	2 0
Potatoes .....	..	2 0	..	1 4	..	1 4	..	1 4
Wheat, per bushel.....	0 1	..	0 0½	..	0 0½	..	0 0½	..
Oats, ditto .....	0 1	..	0 0½	..	0 0½	..	0 0½	..
Loose Vegetables.....	..	2 6	..	2 0	..	2 0	..	2 0
Charcoal.....	..	3 0	..	2 6	..	2 6	..	2 6
Flour.....	..	1 9	..	1 4	..	1 4	..	1 4
Fruit, per box.....	0 2	..	0 1	..	0 1	..	0 1	..

## V. PRACTICAL SUGGESTIONS AND OBSERVATIONS.

I have appended a diagram to illustrate the scheme of marking off the lots on the frontage of the proposed Tramways. The principal feature in the arrangement is the classification, by which a proportionate value can be assigned to each as an upset price. I propose to have the lots marked off in the manner indicated, and submitted to sale by auction, after which they shall be eligible for purchase by private contract. The blocks, which average about forty acres each, will occupy a space of about a mile and a quarter on each side of the line. I would therefore suggest, that in all cases this width should be specially reserved from the operations of the 19th Section of *The Waste Lands Act*. I have considered it requisite to provide for a larger number of Roadways than usual, as the readiest means is always adopted of bringing down timber from the bush; and, by giving abundance of outlets, there is less risk of disputes.

There would be about an average of 39 lots to each mile of Tramway, which might be expected to realise, at the following rates, leaving the outlying lands for selection under the 19th Section of *The Waste Lands Act* :—

	£
13 first class lots at £1 10s. per acre.....	840
13 second class lots at £1 7s. 6d. per acre.....	715
13 third class lots at £1 5s. per acre .....	650
	<hr/>
	£2205
	<hr/>

This estimate leaves little to fear for the reproductive character of the work in reference to the sale of Crown Lands. In a line four miles long, the sale of the lots on a mile's frontage would almost pay the whole expense of construction; and I think it might be so far relied on. But, independent of this means of realising a return on the outlay, the greater facilities for bringing down timber would induce a larger number of men to congregate in the vicinity of the line. Assuming eighty men as a fair proportion for four miles of Tramway, the licence fees would amount to £480 per annum—which is equivalent to a capital of £8000, or more than three times the amount required to construct the work. Besides this revenue, the rent for the Tramway would be still available, amounting I should conceive, at the lowest, to 12 per cent. on the cost, or about £306 for the four miles.

From the above data, I deduce the following result of the probable annual return from all sources for a line four miles in length :—

	£	s.	d.
Rent of 4 miles of Tramway, at 12 per cent. ....	306	0	0
Licence fees for half the number of men above estimated .....	260	0	0
Sale of land on half a mile of Tramway, or about one-sixteenth of the frontage (being half the amount of the above estimate), £1000; equiva- lent to .....	60	0	0
	<hr/>		
	£626	0	0
	<hr/>		

This annual revenue, derived from the undertaking, amounts nearly to 25 per cent. on the estimated outlay.

As a reproductive work, every confidence may be reposed in the construction of Tramways. Sufficient trial has already been made in the Huon District to establish the certainty of this. Some of the works, although constructed with all the disadvantages of inexperience and high labor, now return a fair interest on the original outlay. I may mention the Hospital Bay Tramway,—a large portion of which cost at the rate of £600 per mile, but which now yields 12 per cent. on the capital invested.

There is not much difficulty in estimating the comparative importance of the three lines described in the first portion of this Report, if referred to the standard of repro-

ductiveness to the State; and this, I apprehend, is the test to be applied, as being more in accordance with the object in view. In arriving at this conclusion, I do not for a moment wish that other important considerations should be overlooked; but I give this point a prominence, as the whole question rests more on public grounds than local requirements. Applying this rule, I shall accord the first place to Tramway (B.), the second to Tramway (C.), and the third to Tramway (A.) The particular reasons which have induced me to make this classification are these:—Tramway (B.) passes through a country rich in valuable forests for the greater portion of its length; and, although a more expensive line than the other two, I believe the return would be larger, and would more than compensate for the greater outlay. The second on the list is a short and cheap line, that would open up a large extent of timbered land that is yet untouched, and facilitate the settlement of the Dover Valley and the Township of Walpole. The third line has been marked through a country most favorable as regards the gradients; but the extent of forest land is limited, and the splitting timber inferior, along its route. This line being connected with Tramway (B.) at the Esperance end, the choice of the latter would be the most judicious, if it was considered desirable to open a single line at the northern extremity of the two Tramroads, as leading at once into magnificent land and timber; whereas the former would require to be carried a couple of miles farther before the same quality of country is observed. I look, therefore, at this line (A.) as being only useful at the Southport end, and even there its importance is far below the other two.

So far as I can judge, I am of the opinion that the construction of any one of the proposed works would be a great public benefit; but I am also of the opinion that more material advantages would be gained by disposing the sum, which would construct one entire line, in opening 3 or 4 miles at the extremity of each.

In the first place, I do not see that there is any immediate necessity to connect Southport with Esperance by a Tramroad, as there is no probability of any traffic between the two places for years to come; and even then water transport will be always cheaper. Secondly, that the present requirements of the District will be as well served by opening portions of each as the whole in their entirety; and the effect on the sale of Crown Lands will not be diminished. For, assuming (as I have good authority for doing,) that there will be no work for the central portions of the lines, if completed,—or, at least, no profitable work,—and that the extremities will be more actively employed so long as they are within reach of valuable timber, I do not think it would be judicious to incur an outlay for the construction of perhaps 5 or 6 miles of Tramway before it is required. For the reasons above cited, I should strongly urge the importance of constructing two or three portions of the main lines in preference to expending the entire grant on one. And, in case the grant does not exceed (say) £5000 for this particular locality, I would suggest that the Dover line and the South end of Tramway (B.) be adopted, and the latter brought to the Township of Hythe instead of across the Narrows as proposed. If considered as an experiment, I have every confidence in the reproductive character of the work, provided the grant is expended in the way I propose.

In conclusion, I may express a hope that the introduction of Tramways into general use may receive the support of Parliament. We have the experience of other countries to guide us in the undertaking, by exhibiting the marvellous development of trade and social improvement effected by their means. It may only require the stimulus of example in Tasmania to ensure similar benefits; and, to attain this end, the public money would be wisely and prudently expended.

## A P P E N D I X.

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### TRAMWAY A.

*Port Esperance, 28th June, 1862.*

SIR,

HAVING marked a line which I propose to adopt for the Tramway between Port Esperance and Southport, it has given me an opportunity of examining the country, with a view of ascertaining the quantity and quality of the timber, which is likely to be conveyed to Port Esperance or Southport by the line in question.

I have the honor to report, that I commenced my observations at about three miles from the terminus at Port Esperance, or as soon as I considered that I was off private property.

I have colored the timbered land pink, as shown upon the enclosed tracing, so as to show its position more distinctly in reference to the Tramroad. That portion of the land in the vicinity of the line not colored is open and barren, and produces no timber.

The greatest distance that will have to be crossed from the Tramway before good timber is reached will be about eighty chains. However, for the most part, after the line enters upon Crown Land, until it approaches the terminus at Southport, good timber may be found close to and on both sides of the line. The splitting timber (swamp gum) will be obtained principally on the western side, the eastern side being generally stringy bark for a considerable distance, and then blue gum; afterwards, stringy bark is the predominating timber, which continues with little variation for the remainder of the distance.

It may be very well assumed that the line of Tramway can be used with facility for transmitting the timber from ten thousand acres of land which it passes through from Port Esperance to Southport, every acre of which, I believe, will produce an average yield of three thousand palings per acre, and eight hundred feet of sawn timber. From the above supposition, I beg to submit the following table, which will show the ultimate reproductiveness of the work in contemplation:—

Ten thousand acres of land averaging 3000 palings per acre, at 10s. per	£
1000 for cartage .....	22,500
Eight hundred feet sawn timber per acre, at 10s. per thousand feet cartage ..	4000
Licences for splitting the palings, allowing 4000 to be split for each Licence..	9375
Licences for sawing the timber .....	2000
Amount arising from Timber .....	<u>£37,875</u>

To the above sum may be added £5000 for land, which the Tramway will make available for occupation after the timber has been cut; which will leave the sum as follows:—

Amount arising out of the timber.....	£ 37,875
Amount for sale of land.....	5000
	<u>£42,875</u>
Deduct for construction of the line of Tramway, at £400 per mile, 8 miles ...	3200
	<u>£39,675</u>

leaving a balance of nearly £40,000 for profit, and to pay the expense of working the Road.

In the above calculations, I believe the lowest estimate has been used; besides, there are other things which have been omitted, which would have increased the above amount if they had been entered.

I do not suppose that the sum I have named will be made faster than at the rate of from £1000 to £1500 a year; but that depends entirely upon the demand for, and price of, timber. Should anything tend to give an impetus to the timber trade, the whole cost of the Tramway would be defrayed in twelve months. It would then remain a clear benefit and convenience to the public. However, under present circumstances, I see no reason why a few years will not repay the whole cost of construction, and leave the line of Tramway a means of returning a handsome revenue to the public chest.

The fact of a Tramway passing through, and in the immediate vicinity of, a considerable quantity of good agricultural land, will tend materially to draw a population within its influence; and that land will soon be cultivated, on which at present a human foot scarcely ever treads. Consequently, by the time the timber is exhausted, there will be sufficient produce from the cultivated land requiring conveyance to the port to render the Tramway a remunerative work.

I have the honor to be,  
Sir,

Your obedient Servant,

W. ALCOCK TULLY, *Esquire, B.A., Inspector  
of Surveys, &c.*

RICHARD HALL, *Surveyor.*

## TRAMWAY B.

*Port Esperance, 30th June, 1862.*

SIR,

HAVING so far completed my survey of the line of Tramroad proposed to be constructed from Esperance to Southport as to be able to furnish the requisite information respecting the quality of the land, timber, &c. to which it will afford the means of access, I beg to submit the following Report upon the subject:—

The line which I have adopted diverges from Mr. Hall's at about  $2\frac{1}{2}$  miles from the Port Esperance terminus, recrossing the Creekton Rivulet, and following a branch of the same in a general southerly direction.

For the first mile, it passes principally through private property (that of the Messrs. Maning,) and land of an inferior description. It is therefore only from the commencement of the second mile that any extent will become available.

To facilitate reference, I propose to classify the various descriptions of land in a tabular form; first premising that I have taken, as a basis for my remarks, the width of one mile on each side of the proposed line,—that being, in my estimation, the extent to which the advantages of its construction may reasonably be supposed to reach.

The classification is prepared as under, embracing—

- 1st. Lands within the boundaries of a reserved township, available for sub-division into small lots suitable for agricultural purposes, and fronting upon or but a short distance from the Tramroad. Such lands may be estimated as likely to sell at an average price of 60s. per acre.
- 2nd. Forest land of the best quality of soil, producing the most valuable descriptions of timber for the purpose of the splitter, and as yet untouched. This description of land is fairly worth from 30s. to 40s. per acre, according to its proximity to the Tramroad.
- 3rd. Forest land; also of the best description of soil, but from which most of the best splitting timber has been removed, and which is worth from 20s. to 30s. per acre.
- 4th. Forest land; second quality of soil, but with good timber, as yet untouched, and worth 20s. per acre.
- 5th. Inferior land; timber also inferior, and available only for the sawyer, or for the coarser description of split stuff, as posts and rails, &c. Such lands can hardly be considered saleable, and it is difficult to form any estimate of their value; although the construction of the Tramroad will probably open them more fully for the operation of the system of cutting timber by Licence.

*TABULAR Statement showing the Quantity and Quality of the LAND which would be rendered available by the Construction of "The Port Esperance and Southport Tramway."*

Miles along the Tramroad.	Class 1.	Class 2.	Class 3.	Class 4.	Class 5.	GENERAL REMARKS.
	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	
1st.	-	-	-	-	-	The first half mile passes entirely through private property; and the second half mile near the same, and through inferior land. Little or none available.
From end of 1 to $2\frac{1}{2}$ .	-	2000	-	-	-	The richest description of agricultural land on each side of the line; soil generally red, free from stones, comparatively level, and well watered by numerous small streams; thickly timbered, principally with swamp gum of medium size apparently most suitable for the purpose of the splitter, with an undergrowth of dog-wood, tree ferns, &c.
$2\frac{1}{2}$ to 3.	-	300	-	300	-	Eastern side of line, same as above; western side, stringy bark flats, principally gum topped; soil not so good.
3 to 4.	-	600	-	500	-	Eastern side of line, same character as preceding; western side, tea tree swamp of about 140 acres; remainder, second quality of soil with good timber—chiefly stringy bark, gum topped.
4 to $4\frac{1}{2}$ .	-	300	-	300	-	East side of line, same character as preceding, but rather more broken; west of line, soil good in patches, but generally rather inferior; timber chiefly stringy bark, some of which, immediately along the line, has been cut.
$4\frac{1}{2}$ to 5.	-	300	300	-	-	Both sides of line very good timber and land; but on the western side the timber has been worked to a considerable extent.
5 to $5\frac{1}{2}$ .	-	-	-	-	-	Land of very little value for some distance either side of the line, being principally open, lightly timbered and swampy.
$5\frac{1}{2}$ to 7.	200	-	-	-	1000	Township of Hythe.
7 to Terminus, about $2\frac{1}{2}$ miles.	-	-	-	-	-	This last portion of the line passes close to the coast, and through a very inferior description of land, alternately swamp, stony and bare hills, and heathy and sandy. There is nothing either on or near the line to which any estimated value can be attached; although it is possible that, forming as most of it does a portion of the Township of Hythe, the improvement of the place and increase of population, consequent upon the extension of the Tramroad system, may give it a local value which at present it cannot be said to possess.

GENERAL SUMMARY.

Miles of Tramroad.	Description of Land.	Land available chiefly or altogether for its Timber.	Land available for Agricultural Settlement.	Average value per Acre	TOTAL VALUE.		
		<i>Acres.</i>	<i>Acres.</i>		£	s.	d.
1	None available.						
From 1 to 2½	2nd class, suitable both for agricultural and splitting purposes.	..	2,000	35s.	3,500	0	0
	2nd class, as above.	..	300	35s.	525	0	0
2½ to 3	4th class, or land second quality of soil but producing good timber.	300	..	20s.	300	0	0
3 to 4	2nd class.	..	600	35s.	1,050	0	0
	4th class.	500	..	20s.	500	0	0
4 to 4½	2nd class.	..	300	35s.	525	0	0
	4th class.	300	..	20s.	300	0	0
4½ to 5	2nd class.	..	300	35s.	525	0	0
	3rd class, or superior land, from which the best timber has been removed.	..	300	25s.	375	0	0
5 to 5½	No land available.	..	200	60s.	600	0	0
5½ to 7	1st class, or township land.	..					
7 to Terminus, about 9½ miles.	5th class, or land available <i>only</i> for its timber.	1,000					
	No land available.						
Total quantity, & estimated value.		2,100	4,000		£8,200	0	0

With reference to the latter portion of the line, the question of the advisability or otherwise of its present construction must necessarily depend, in a very great measure, upon the extent to which it is proposed to carry out a general system of Tramroads; as, in the event of two or more lines tending to the same point of shipment, it would undoubtedly be desirable that the most suitable should be selected, comparatively irrespective of cost. But, considering the line laid out by myself as a single undertaking only, it is by no means absolutely necessary that it should be continued across the Narrows; but I would rather recommend that its terminus should be upon the northern side of the Port, which would materially lessen the required outlay, and, I think, tend to render the undertaking more immediately reproductive and self-supporting. In order to illustrate this, I would point out, that a saving of cost of construction would thereby be effected, amounting to from thirteen to fifteen hundred pounds, and also that two additional miles of land carriage would be avoided, thereby materially lessening the expense of conveyance; advantages which would probably more than compensate for the loss of any, which might otherwise accrue from the completion of the whole line as originally contemplated.

It is, I conceive, unnecessary that I should enlarge upon the benefits to be derived by this District—and indeed by the Colony in general—through the formation of Tramroads, such being almost universally admitted. The only difference of opinion being, I believe, with reference to their success financially as reproductive works; and also as to the particular localities best suited for their experimental introduction. The latter question, I have no doubt, is one of considerable importance, it being more than probable that the ultimate extension of the principle throughout the District—perhaps throughout the Colony—will, in a measure, depend upon the success or otherwise of those lines first constructed. Upon this subject, (having from my official connection with the District, a considerable general knowledge of the natural features and capabilities of the various portions of it,) I may be permitted to express my opinion to the effect that, taking the whole line from terminus to terminus, and considering that it forms an outlet to, as well as a communication between, two distinct Ports, it would be impossible to select any other in which all the elements of success shall be more, if as favorably combined,

I am not prepared to recommend the immediate construction of the whole line, but would rather suggest that a certain number of miles from each terminus, sufficient to give access to the hitherto untouched timber, should be proceeded with at once,—the profits arising from the working of which, would provide a fund for the ultimate completion of the intermediate portion; and I believe that, were this principle generally adopted, no outlay would be required on the part of the Government beyond the first necessary to start the undertaking.

With reference to the charges which should be fixed upon for the conveyance of timber, produce, &c., I would suggest the following for a basis, as being sufficient, with a reasonable amount of traffic, to provide for the remunerative working of the line:—

For each 100 of 5-foot box-palings, and in proportion by weight for other description of timber or produce .....	1st mile.....	6d.
	2nd „ .....	5d.
	3rd „ .....	4d.
	4th „ .....	3d.
	5th, and each succeeding mile..	2d.

I have found, upon enquiry, that the general charge for carting this description of timber (5 feet box paling) upon the bush roads ranges from 9*d.* to 1*s.* per 100 per mile. In some cases, however,—as upon the newly opened road at the Franklin,—the charges have been, in the summer-season, as low as 6*d.* per mile per 100; and it is from this information that I suggest the foregoing scale as being sufficiently low to ensure the requisite amount of traffic.

In concluding my Report, it is satisfactory to be enabled to state, as the Surveyor for the District, that, notwithstanding the general depression of agricultural pursuits, the settlement of the District under my charge is steadily and surely progressing; a manifest improvement being perceptible of late, both with regard to the number of applications for land, and also with regard to the character of the same,—few of the selections made at the present time coming under the denomination of “speculative,” as a few years back was so particularly the case. A very fair per-centage of improvement has also been effected upon the majority of those lots alienated since the passing of the present *Waste Lands Act*; and the working classes (especially the sawyer and splitter) are beginning better to understand and appreciate the very favorable conditions upon which freeholds may be secured under its provisions. Perhaps the only drawback to the more complete and successful working of the Act consists in the fact that so large a portion of the most available lands is still, or has lately been, held under the Pre-emptive Right Regulations of 1851; thereby shutting it out from the operation of the 19th Section, and in many cases presenting a formidable obstacle to any attempt to effect the settlement of the lands in the rear.

I have the honor to be,

Sir,

Your very obedient Servant,

GEORGE INNES, *District Surveyor.*

J. E. CALDER, *Esq., Surveyor-General.*

#### TRAMWAY C.

*Strathblane, 1st July, 1862.*

DEAR SIR,

I now present you with a Report of my proceedings upon your instructions, dated 29th March, 1862, to survey and lay out a line for a Tramway from Southport to Flight's or Surges' Bay on the Huon, by Port Esperance (crossing the Esperance at the Narrows with a view to its being continued to Hobart Town), by Hospital Bay and the Franklin.

I have already personally described to you the engineering difficulties and want of local attraction for a Tramway from Surges' Bay to Hospital Bay, which some time ago induced us to alter the original scheme of making this a through line from Southport to Hobart Town, and simply to construct local lines for the requirements of the District, and also to explore the country from Southport to the Kermadec River (in a direct line) with a view to a Tramway being carried through in that direction. I have therefore laid out a line for a Tramway 3 miles in length, commencing at Dover and running north or north by east through the Township of Walpole, ending in a very fine bed of splitting timber extending north and east several miles.

I have also had Mr. Middleship exploring the country from Surges' Bay to where I left off surveying (3 miles north of Dover), with a view to having this line continued to Surges' Bay at some future time. He reports a range of hills completely obstructing the line. A local line of 2 or 3 miles extent (terminating at Surges' Bay,) running up one or more of these gullies would be of great service to that District, and be the means of bringing to market much valuable timber—in which the place abounds.

On the Dover line there is very little splitting timber for the first 3 miles. From that point, extending to the north and east, a very considerable bed of timber exists,—quite sufficient to warrant incurring the expense of laying down a substantial Tramway to work the timber, and afterwards be of great benefit to the District.

The plan I propose is, to lay down 3 miles of Tramway, with sufficient jetty accommodation for large vessels &c. (as per estimate,) to start with, and every year add half a mile to the original line in any direction where it is most required. The returns from the line will not only pay for the extension, but also principal and interest on the original outlay within ten years from the date of opening the line, as shown by the following estimates:—

#### *ESTIMATED Cost and Traffic Returns of Three Miles of TRAMWAY at Dover, Port Esperance, South Huon District.*

COST OF PLANT.		£	s.	d.
Jetty .....		600	0	0
3 Miles of Tramway, at £550 per mile .....		1650	0	0
Offsets, half a mile at £550 per mile .....		275	0	0
1 Railway Weigh-bridge .....		60	0	0
1 Small Portable Weighing Machine .....		7	0	0
20 Waggons, at £30 each .....		600	0	0
Station Office .....		50	0	0
Eight-horse Stable and Hay-loft .....		100	0	0
		<u>£3342</u>	<u>0</u>	<u>0</u>



In the above estimate, the jetty is supposed to be in the form of the letter T; the tail of which is 300 feet long, carrying a double line of Trams, and foot-path accommodation at the sides. The crosshead is  $150 \times 50$  feet, constructed to provide accommodation for vessels drawing 16 feet of water.

The cost of Tramway (£550 per mile) includes a substantial Tramway with no gradients rising to the water, cost of survey, superintendence of works, clearing and scrubbing the line  $1\frac{1}{2}$  chains wide for the better prevention of fire, and draining the line where necessary.

To complete the above, a four-roomed cottage ought to be appended; but your reiterated charges on the score of economy were so numerous and energetic that I leave that for your consideration, and proceed to lay before you the estimated amount of traffic on the above line.

#### ESTIMATED AMOUNT OF TRAFFIC.

	£	s.	d.
100 Men will split on an average, 250 palings per man per day = 25,000, weighing $4\frac{1}{2}$ lbs. each, or 50 tons per day. Hauling on 50 tons for 3 miles, at 1s. per ton per mile.....	7	10	0
Truckage (loading and discharging), at 1s. 6d. per ton .....	3	15	0
Wharfage on 50 tons, at 9d. per ton .....	1	17	6
	<u>£13</u>	<u>2</u>	<u>6</u>

The above estimate is based on the supposition that 100 men will find employment on the line when completed, and that each man will produce 250 palings weighing  $4\frac{1}{2}$  lbs. each, or other produce to that amount; viz., 50 tons per day.

I do not suppose that all these men are to be employed in splitting palings. The district abounds in various woods besides splitting timber,—Rosewood, Pinkwood, Sassafras, Myrtle, Hickory, &c.,—all which can readily be brought to market in their rough state by means of the Tramway, and produce a much greater amount of traffic than I have estimated. The present rate of cartage in this district is 2s. per 100 palings for  $1\frac{1}{2}$  miles, besides carrying the palings 1 mile before carting—involving an additional expense of 2s. per 100, or 4s. per 100 palings for the whole distance.

The whole charge on the above estimate for conveying palings by Tramway a distance of 3 miles is under 1s. per 100 palings weighing  $4\frac{1}{2}$  lbs. each, or less than a fourth part of the present rates.

I shall now proceed to show you the cost incurred in conveying 50 tons of produce along the 3 miles of Tramway to the jetty, including rent at 25 per cent. on the outlay of £3342.

#### ESTIMATED AMOUNT OF DAILY EXPENSES.

	£	s.	d.
Interest on £3342, at 25 per cent. ....	835	10	0
300 Working days per year, at £2 15s. 9d. per day .....	836	5	0
	<u>£</u>	<u>s.</u>	<u>d.</u>
Daily rent on 300 days a year, at 55s. 9d. ....	2	15	9
6 Horses, at 4s. per day .....	1	4	0
6 Drivers, at 6s. per day .....	1	16	0
6 Assistants, at 6s. per day .....	1	16	0
1 Clerk, at 7s. per day .....	0	7	0
1 Superintendent, at 10s. per day .....	0	10	0
Interest on capital, tear, wear, &c., per day .....	1	0	0
	<u>9</u>	<u>8</u>	<u>9</u>
Balance, profit to Contractor per day .....	3	13	9
By daily traffic.....	<u>£13</u>	<u>2</u>	<u>6</u>
	<u>£1106</u>	<u>5</u>	<u>0</u>
Premium of 300 days, at £3 13s. 9d. per day .....			

TABLE showing the Plan of paying off the Debt on the DOVER TRAMWAY within Eight Years, and Annually adding Half a Mile to the Length of the Line.

Annual Amount of Profit deducted from Principal.	Principal.	Rate per cent.	Interest.	Cost of Half a Mile of Tramway to be added Yearly.	Annual Rent of Tramway.	Annual Amount of Profit deducted from Principal.
£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.	£ s. d.
359 19 7	— 3342 0 0	6 per cent.	200 10 5	+ 275 0 0	— 835 10 0	= 359 19 7
381 11 7	— 2982 0 5	"	178 18 5	+ 275 0 0	— 835 10 0	= 381 11 7
404 8 9	— 2600 8 10	"	156 1 3	+ 275 0 0	— 835 10 0	= 404 8 9
428 14 9	— 2196 0 1	"	131 15 3	+ 275 0 0	— 835 10 0	= 428 14 9
454 8 4	— 1767 5 4	"	106 1 8	+ 275 0 0	— 835 10 0	= 454 8 4
481 14 4	— 1312 17 0	"	78 15 8	+ 275 0 0	— 835 10 0	= 481 14 4
510 11 7	— 831 2 8	"	49 18 5	+ 275 0 0	— 835 10 0	= 510 11 7
541 4 9	— 320 11 1	"	19 5 3	+ 275 0 0	— 835 10 0	= 541 4 9

This Table shows—the principal, £3342; rate at which it may be borrowed, 6 per cent. Interest for the first year £200 10s. 5d., half a mile of Tramway to be added yearly £275.—deducted from the annual rent £835 10s., leaves a balance of £359 19s. 7d. to be taken from the principal, reducing it to £2982 0s. 5d. at the end of the first year, and so on until the whole debt, principal and interest, is paid off.

I have now laid before you, in a tabular form, my ideas of the cost and traffic of 3 miles of Tramway commencing at Dover and generally following the course of the Dover Rivulet.

I am not aware that it is necessary for me to say much more on the subject. There is timber sufficient to justify the expense of a short line of Tramway. The Tramway itself will be the cheapest, in point of first cost, and the most economic in its working arrangements of any Tramways that can be laid down in this quarter.

Should any further information that I can supply be required, I shall be most happy to give it, either personally or by letter.

SOUTHPORT AND HOSPITAL BAY DIRECT.

This track is cleared 7½ miles from the head of the Southport Narrows to the Esperance River. The first four miles the land and timber are of medium quality. Beyond that, to the Esperance River, both land and timber are described as something superior to anything I have seen. The outline of the country is not unfavorable to the formation of Tramways.

I am, dear Sir,

Truly yours,

DAVID CHAPMAN.

J. E. CALDER, Esquire.

The following Extracts from the Reports of Mr. John Watson, who is at present engaged in the examination of the country in the vicinity of Port Esperance, and whose experience in all matters connected with the Colonial woods is so well known, are annexed as embodying information of a valuable nature with respect to the proposed scheme of Tramways:—

W. A. TULLY.

"I have examined the forest of timber to the east of the Southport Road. With few exceptions, the land is covered with a most superior description of splitting and sawing timber, and is not so hilly as I expected to find it. The soil is very good, generally."

The country alluded to by Mr. Watson extends for several miles along the proposed route of Tramway (B.)

"On the west side of the Road, in about half a mile, I came to some very fair sawing and splitting timber. The scrub was not so bad amongst the timber. About a mile from the Road brought us to the Creek. The land to this is nearly level, and the soil very fair. After we crossed, we came on very flat bottom land, lightly timbered, but of a fine sort for splitting and sawing. \* \* \* On the flat I found a few lightwood trees, but not more than 14 inches in diameter; they are, however, the Black Forest lightwood. I think I never saw any soil so good in the country before. I noticed that all the trees grow with very large spurs, which I take as an instance of the fertility of the soil. There were no large trees down. It would take but little labor in clearing for grass or cultivation. \* \* \* It is most admirably adapted for laying a Tramway or plank Road, as many years must elapse before the timber will be exhausted."

Tramway (A.) passes through the above-described land, and will also open up the western portion of the Township of Hythe, of which Mr. Watson reports favorably.

"I have been to Southport, and examined the timber and land about there, on that part marked on the Chart for the Township of Hythe. At the western end there is a large quantity of very fine stringy bark, which I have no doubt extends further back and joins the western forests. On the outside of it I saw a few very large blue gums,—I think the finest I ever saw,—and have no doubt there is a considerable quantity of such trees about the neighborhood. The soil in that portion of the Township appears to be of the first class."

Mr. Watson speaks of the country in the vicinity of the Township of Walpole in the following terms:—

"On the north east a branch Tramway would run into a very fine bed of timber fit for splitting and sawing. It is the same bed of timber I saw a few years since. On the Township of Walpole there is still some good splitting

timber left. What would not go into palings would be put into posts and rails, if there was a Tramway. I do not know of any other part where so many fine roots of lightwood and myrtle could be so easily procured, or at so cheap a rate. On account of the land of the Township being in small lots, it would pay the holder to grub them in clearing the land. Most of the lightwood and myrtle are on the lots; and, if the Tramway was laid down, there would be considerable competition for those now unsold. \* \* \* The hills abound with peppermint, which is the best I have ever seen. No wood in the world is better for posts and shingles especially. There is also a considerable quantity of gum and stringy bark trees, with little or no scrub, so that no Road clearing would be wanted for drawing out to the Tramway. \* \* I consider that, if one hundred men were employed on the land that the proposed Tramway would reach, they could not exhaust the timber in ten years or more. \* \* \* We struck in a few chains from the back line of Walpole in a north-easterly direction, and found a great deal of level land, after a slight rise of three or four chains in length, with a bed of timber in it not to be surpassed in the Colony, both for splitting and sawing; also a quantity of musk roots larger than I have noticed elsewhere. The timber appears to extend northward between the Huon Tiers and those on the right of the Flight's Bay Track. The land generally appears to be excellent. I consider the timber I have seen would supply three hundred men for twenty years, with five miles of Tramway laid down. \* \* \*

\* \* \* We struck in south west from the Township of Walpole for about half a mile, when we came to the foot of the Tiers. That part we passed over is quite level, and lightly timbered. We then altered our course more towards the south, crossing several spurs and gullies, until we gained the top of the Tiers. They appear to run north and south, as far as I could see. On the side we passed over there is some very fine timber, and on the top there is a very large extent of table land, with an immense body of timber, which I believe continues for a long way back. All this timber could be got to the Tramway with an easy carriage, as the scrub is not heavy on the table land. There are some few stringy barks, but the timber is principally of a suitable kind for splitting, and appears to be of a very fine description."

The extract above quoted applies exclusively to Tramway (C.), which has been marked out in the direction of the Dover Rivulet, and passes through the Township of Walpole. The distance already surveyed will give access to the land and timber referred to by Mr. Watson.