

THE ESTABLISHMENT OF THE
MUSEUM OF TRANSPORT AND TECHNOLOGY TRAMWAY

Presented by Ian Stewart

Ladies and gentlemen, my talk is on the establishment of our tramway at MOTAT; the various reasons why we adopted certain things and also some of the problems to do with the past present and future.

In Auckland, tramway preservation started in 1952 when the Auckland Transport Board celebrated 50 years of electric traction by painting tram-car No 11 to look as it it was draped in bunting and running it for a period over all the Auckland Tramway Routes. No 11 was used because it was one of the first batch of 43 Brush cars to start the electric service in 1902 and was, in fact, the first car erected.

After celebrations the car was presented to the Auckland City Council to keep for posterity. It was housed under an open shelter in the Auckland Zoo. Because the lowest number of the first batch cars had been kept, my brother Graham who, as you know, is a New Zealand tramway historian, considered the idea that it would be good if one of the latest cars was kept for posterity. He put the proposal to the Manager of the Transport Board who agreed. The result being that the Board offered tram No 253, which Laurie Everiss was talking about earlier, to any interested museum or organisation. However, in those days, if anyone talked about preserving a tram car they were considered a little unbalanced and there were no takers.

As there were no takers, the Board agreed to give it to Graham if he agreed to form a society to care for it. Well, as it happened, a cousin of his wife, a Mr Mervyn Sterling, who you met on the first day of the Conference, got interested and they formed the Old Time Transport Preservation League in 1958; two years before this museum was formed.

Tram 253 was taken up to Mervyn's farm, which is ninety miles from Auckland, together with tram No 248 which happened to be a tram which his uncle once drove. A building was erected from scrap material which Mervyn had bought from the Auckland Transport Board during the scrapping of the trams and sold to local farmers. As the result of deputation from the League, other cars from Wellington were donated by the Wellington Corporation Tramways in 1958, just before they were due to be scrapped. These were Double-decker No 47, Rail-grinder No 301 and Double-saloon No 135. Because of storage problems, delivery of these cars to Auckland did not occur until MOTAT was formed.

The League never prospered, mainly because of the distance it was from Auckland (90 miles away) and in 1960 when this museum was formed, the Old Time Transport Preservation League was one of the founding societies of MOTAT and the trams eventually returned to Auckland.

With the formation of MOTAT and the voluntary sections attached to it, there were quite a few interested people who were keen on getting these trams actually operating and a lot of the members who started off the Tramway Section are still with us today - Ian Mison, John Wolf and quite a few others.

One of the first tasks of the Section was to increase the tramcar collection by obtaining three Fiducia Cars from the Wellington system as it was being scrapped. The Shell Oil Company donated Nos 244 and 257 and the last car to run in public service in New Zealand, No 252, was bought by MOTAT. Other cars from Wellington had been obtained as a result of a deputation from the League to the Wellington City Corporation Tramways in 1958, just as the cars were about to be scrapped. These were double-decker No 47, rail grinder (ex freight car) No 301 and double-saloon No 135. Because of storage problems, delivery of these cars to MOTAT did not occur until several years after MOTAT was formed.

The construction of an operating tramway was the next task. At first there were problems. One being that before tramway construction could start there were legal matters to be sorted out. In New Zealand the Tramways Act would normally permit only a local authority to construct a tramway. However, the museum's solicitor overcame the problem by applying section 6 of the Tramways Amendment Act, 1913, which allows the suspension of provisions of the Tramways Act, 1908, by proclamation by the Governor General.

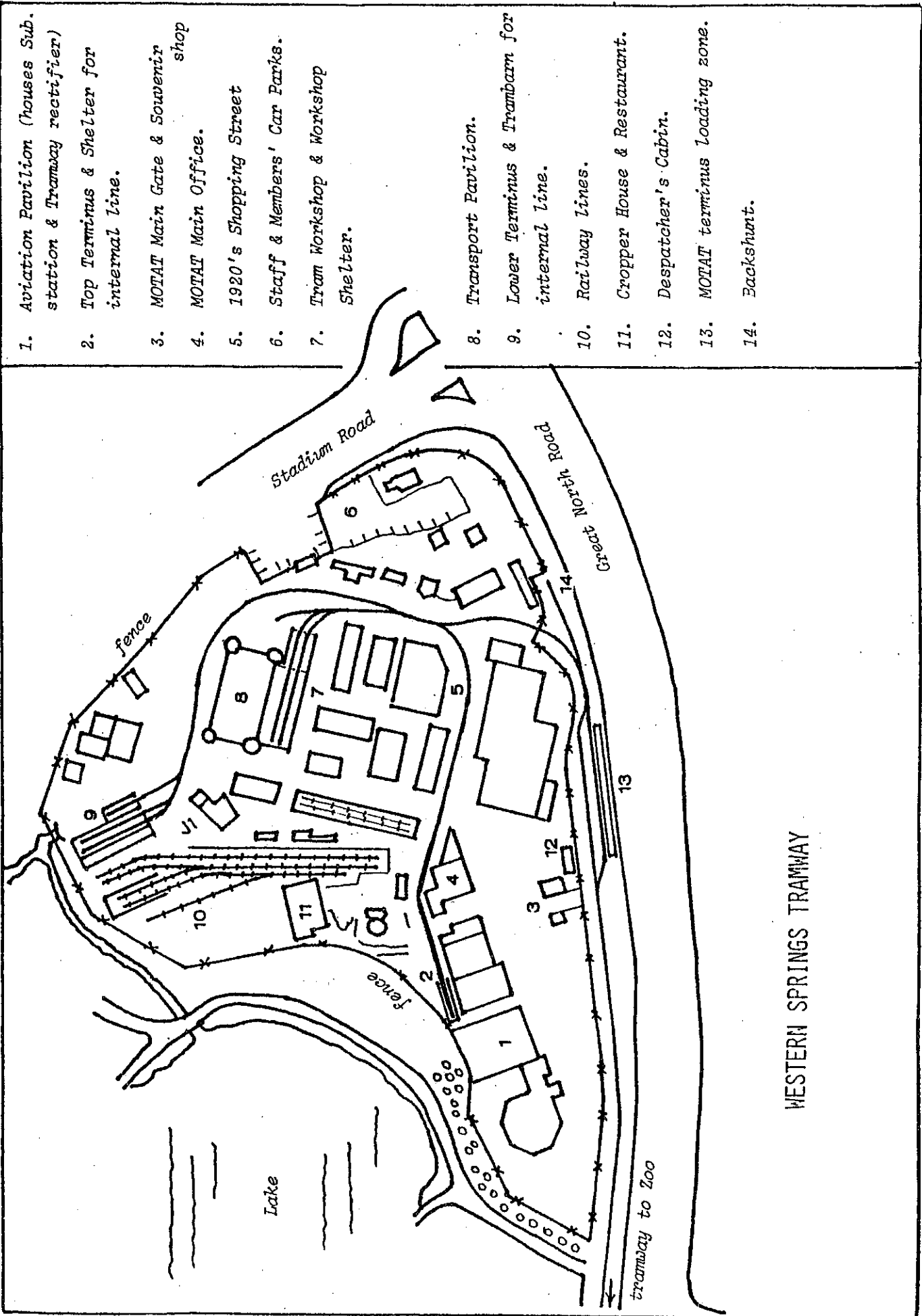
The Proclamation states, and I quote the main parts:- "do hereby suspend the operation (a) the Tramways Act, 1908 and all amendments thereof with the exception of the Tramways Amendment Act, 1913 and (b) the Tramdrivers Regulations, 1947 and all amendments thereof shall continue in full force and effect as though the Tramways Act, 1908 had not been suspended."

This, in effect, means that we have to abide by all safety standards and be subject to Ministry of Works Inspection. In this respect Mr Laurie Everis, whom you have met, is our Honorary Inspector, responsible to the Ministry of Works. Also our Motormen have to undergo a practical driving test conducted by the District Engineer Surveyor of the Marine Section of the New Zealand Transport Department.

Now to deal with construction. As the Auckland trams were standard gauge, 4' 8½", and the Wellington trams were 4' 0" gauge, our first plans did not envisage dual gauge, but allowed for two tracks going in opposite directions. In thinking it over, we soon realised the drawbacks there would be in not being able to run all cars over the whole system, so the decision was made to construct a dual gauge tramway system. At this time we did not know what we were in for and some enthusiastic Museum staff had laid one length of dual gauge track. It was then that we thought we had better consider which was the best side to place the common rail as it would have a bearing on the construction of dual gauge special works. As all our plans for the internal line as well as the proposed zoo line showed the track around the perimeter of the area, it was obvious that the common rail should be on the inside of the perimeter as any turnouts would be more likely to be towards the area's centre. This allowed a single tongue-switch to be used in the common rail for a turn-out. It would give the proper guiding of the wheels and allow a more simply constructed dual open-mate in the dual rails. It was just as well that we considered the problem as the common rail on the length of track already laid was on the wrong side. For a long time we never got around to making any dual-gauge open-mates and we became experts in using jumping plates and wandering leads.

We started laying track using sleeper construction in late 1964 and opened the internal Museum line for passenger service in December 1967. The first 400 feet of overhead was erected by the Auckland Regional Authority Overhead Department but since then the Tramway Section has carried out all new work and maintenance.

The internal service was opened with Auckland car No 253 and Wellington car No 257. In regard to passenger loading, we did reach peaks of 85,000



1. Aviation Pavilion (houses Sub. station & Tramway rectifier)
2. Top Terminus & Shelter for internal line.
3. MOTAT Main Gate & Souvenir shop
4. MOTAT Main Office.
5. 1920's Shopping Street
6. Staff & Members' Car Parks.
7. Tram Workshop & Workshop Shelter.
8. Transport Pavilion.
9. Lower Terminus & Trambarn for internal line.
10. Railway lines.
11. Cropper House & Restaurant.
12. Dispatcher's Cabin.
13. MOTAT terminus loading zone.
14. Backshunt.

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passengers per annum over 600 yards of track (there and back). It did reduce and in our 1977 annual report the number of fare paying passengers was 78,000; number of car trips estimated was approximately 4,500; car mile over the internal track was 1500 and the average passengers per car trip was approximately 17.5. I don't think we are doing that on our outside track yet. In 1978 the steam tram was brought into service and that added extra activity on special occasions.

In the mid 1970's the Auckland City Council's attitude to running the tramway outside the Museum grounds to the zoo mellowed and we were invited to submit plans and negotiate. They finally agreed the route would be along the Great North Road to the corner of Motions Road, thence along Motions Road to the proposed new Zoo entrance.

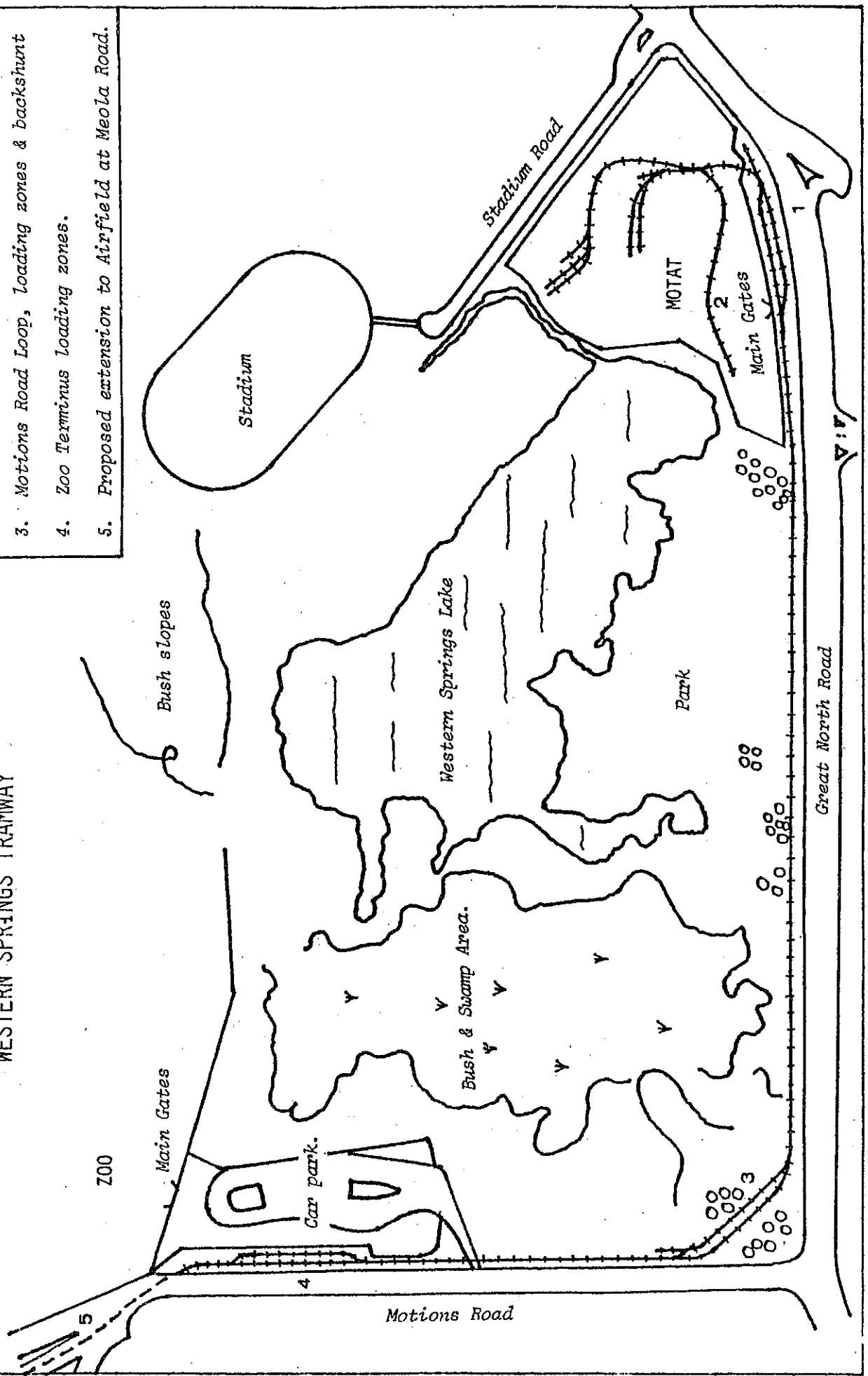
The track was not to be in the roadway but on the edge of the parkland on the boundary of the footpath. Now, some may think this is a dangerous operation with trams travelling along the park edge with pedestrians going back and forth; but so far so good, we have not found it too bad to live with. We just have to be careful as the council stipulated that the tramway must be flush and sealed and must not impede pedestrian access to the park. The Council was also concerned with the appearance of any overhead poles and further stipulated that any traction poles must either be steel or concrete; they did not want any mis-shapen wooden ones which were so prolific around the city holding up trolleybus overhead and power and telephone lines. Being aware of this, we submitted plans showing steel poles with ornate scroll iron work as was fitted on the original Auckland Electric Tramway Company's poles in Queen Street and elsewhere. At a later meeting with the Council the City Architect, who had a grudge about untidy, unnecessary street hardware, mentioned that he definitely wanted the scroll work fitted as he thought it looked good. I often wonder if our drawings showing the scroll work was one of the main reasons that the Council finally gave permission for the tramway construction to proceed to the zoo.

Luckily for the Museum, in 1978 a Government Work Scheme initiated the start of construction. The line to the zoo was completed and opened for passenger service in two stages; to the Motions Road corner in December 1980 and to the zoo in December 1981. The works scheme has also been responsible for the building of our new display barn and the track within as well as the special work approaches. This work has only recently been completed.

I now wish to talk about our track construction. Our first efforts within the museum grounds used hardwood sleeper and ballast construction which was sealed at a later stage. This track has been in constant use for 17 years and although it has stood up better than ever expected, it is now requiring maintenance. Our main thought when considering the type of track construction for the 1km zoo line was what type will do the job for the longest time with the least maintenance. The answer seemed to be mass concrete. We obtained all the information from the Melbourne system and compared the economics of using mass concrete compared with sleeper track construction. Concrete worked out to be 10% cheaper, so we proceeded with mass concrete construction. There were also other reasons such as our precious lengths of tram rail, which we were keeping for inside curved sections of rail, had no fishplates so the sole plate welded joint, as used in mass concrete construction, was the answer. Other advantages were that no electrical bond wires were necessary because the joints would be welded. This would give less voltage drop at the end of the line because you would not have to take into account the extra voltage drop due to numerous bonds. We were also well aware of the disadvantage of extra noise and the fact that such a solid track requires a smooth top. So far, we have not achieved the smooth top but we intend to manufacture our own rotary grinder in due

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- 1. MOTAT Terminus
- 2. MOTAT internal tramline
- 3. Motions Road Loop, loading zones & backshunt
- 4. Zoo Terminus loading zones.
- 5. Proposed extension to Airfield at Meola Road.



course. Many people think that our track is smooth but when you place your hand on a moving tram motor gear case, you pick up every imperfection. So for the least wear and tear on track and car equipment you must try and achieve a smooth top.

Except for the limited amount of 112 lb tramway rail used for the curves, our rail is of the 85 lb and 91 lb railway type. We obtained the rail from the N.Z.R. at scrap value. It was mainly high-leg rail that had been used in the outer leg of a curved track which had worn thin in width but had little wear in depth. As our tram wheels are only 2 inches tread width, we selected rails that still had 1 3/4 inches of tread left.

Other problems to overcome were the manufacture of dual gauge special work. The single tongue switches were not a problem as we had enough in stock. Because the works scheme allowed for money to be spent on professional services, the Museum was able to engage the services of a consulting engineering firm to report on methods of track installation, welding of track joints and manufacturing of special work.

The construction of dual gauge open-mates like the one adjacent to the Museum's entrance gate which was done the conventional way, by mitreing rails and welding up using formed shear plates, caused many headaches and took a long time. This was because we were using inexperienced labour and was therefore the only one constructed that way. We then devised a construction which used a large 5/8" thick plate of hard wearing steel, well supported and welded to a bed of railway rails. On top of this plate was welded various pieces of the same steel to form the grooves and treads for the wheels to run on. As the top treads were only 5/8" thick, there was no need for ramping as the flange or the wheel would be close to the main bed plate of the fabrication. The results so far have been very gratifying.

The overhead is mainly side-arm or centre pole bracket construction copied from the Auckland Electric Tramway Company style. Span wire construction has been used on the sharper curves. We use twin wire overhead, spaced approximately 9 inches apart, which means that no frogs are required at turnouts for passing loops as one wire follows the second track of the crossing. It also overcomes any voltage drop problems.

We have now been running over the zoo line since 1981 with no track problems apart from the need to grind the track to correct profile and remove some corrugations. A few old railway rail burrs have shown up which will require building up with weld and grinding. It is often hard to find these faulty rails when they are in a stack and rusty but as soon as they are used you find the imperfections. It is very important that on straight track all rail must be straight both horizontally and vertically before being installed. In the haste to speed construction, our works scheme labour often overlooked this requirement with the result that where a slight vertical kink occurs near a rail joint giving perhaps a vertical deviation of only 1/2 degree, it is probable that a cupped joint will appear. Where the joints are true across the top, the joint has remained perfect. I have always found that putting rails in to proper standards is well worthwhile in preventing future problems.

In the future, it is the intention of the Museum to extend the tramway from the zoo entrance another 5/8km to its Sir Keith Park Memorial Site. It is planned to have a storage barn and workshops in the area. The track extension along Motions Road has already been approved by the Auckland City Council. Also the Council has set up an area management committee which includes representatives of the Zoo, Museum, Stadium and other users of this area to promote future development. This could mean future extensions for the tramway system in the years to come.

Our power supply is a 675K Hew mercury-arc glass bulb rectifier. It was donated by the Auckland Electric Power Board and originally served the Mt Roskill trolley bus area. Being 675K capacity, it is much larger than we require so we have no problem with showing off our whole fleet at once along the line. In the future, we intend to install another power supply at our K.P.M. site, as I believe no traction system should rely on one supply only. We also have a diesel motor generator set which was donated by the Auckland Regional Authority. This set was originally made for testing their new trolley-buses which ended up in Wellington. We intend keeping it for emergency use as it would operate one or two trams. Our original power supply came from the ARA trolley-bus distribution system which they very kindly kept supplying us until the system closed and we installed our own.

In conclusion, I will just say a few words about buses. We intend to erect a trolley-bus circuit within the Museum grounds at Western Springs and have plans to operate trolley-buses within the K.P.M. site at some future date. We also have a few examples of early petrol and diesel buses. I feel that buses in general, that is petrol and diesel, being so much part of our urban transport, have a definite place in any transport museum and that the main types should therefore be retained and displayed alongside the tram.

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