

## Engineering Department

A. W. CAMPBELL,  
O.L.S., C.E., M.C.S., C.E.

### Electric Railways.

The use of highways by electric railways is creating new problems with regard to the maintenance of roads. The number of charters now being sought indicates that this use of the highway will increase very largely in the near future. This means of travel and transportation is beneficial to the district through which the railway passes, especially the property immediately adjacent to the line of railway. In fruit districts the advantage is marked, in that perishable and tender products can be conveyed to the market with rapidity and careful handling. In other respects the advantages of the town, through this convenient means of transportation, become a part of country life; so much so, that suburban residences of business men are found considerable distances from the town, wherever electric railways exist. With these advantages come certain disadvantages and there are details connected with the maintenance of highways upon which electric railways have been constructed that require the attention of municipalities.

#### AGREEMENTS.

Agreements between electric railway companies and municipalities should be made as perfect as possible. All possible contingencies should be provided for by the municipality. Good judgment is needed in discriminating between what is necessary, to safeguard present and future public interests, and that which may reasonably be omitted as an unnecessary restriction. Much care should be exercised in drawing up these documents to see that all the essential conditions are clearly and fully covered. In dealing with these matters the experience of other municipalities should be sought.

#### LOCATION.

The natural location for an electric railway would appear to be, in most cases, along the public highways. Here it is most convenient for the public using the cars, and the railway companies naturally benefit by the greater amount of traffic which thereby arises. One of the chief merits of the electric railway is that it passes close to one's door, and that the cars can be stopped at any point to let passengers on and off.

From this occupation of the common road by electric cars, the principal difficulties arise.

Where these railways, as is commonly the case, are laid on the graded and travelled portion of the highway, the width of roadway for ordinary traffic is confined to a narrow strip. Surface drainage from the road to the side-drain, is interrupted by the railway track, and the expense of maintaining the road is increased.

During the time of snow-roads, when the roads are drifted and the snow is deep, the snow thrown from the railway track by the snow-plow is piled high on the sleigh road, and difficulties are experienced, varying with the nature of the snowdrifts. Where wire fences exist, the tendency at all times is for the sleigh road to pile up to an inconvenient height. When, alongside this, the snow from the railway track has been plowed out down to the surface of the rails, the sleigh road is left in a dangerous condition.

The rails in the roadway, the poles and wiring at times cause a certain obstruction to the free use of the highway, from which accidents occur. An element of danger arises from the frightening of horses by electric cars, interfering much with the ordinary use of the highway.

In some cases, as road improvement progresses, the grade of the road may have to be altered, necessitating the raising or lowering of the railway tracks. Openings may be needed under the track for culverts or drainage.

All of these are details which are more or less affected by the location of the tracks. As has been pointed out, the roadway offers mutual advantages both to the company and to the public. Moreover, property owners would, as a rule, object to placing the railway to the rear of their residences, across the farms, thereby cutting up the fields.

It has been suggested that the railway companies could purchase a narrow strip in front of the farms and adjacent to the highway, so that the present fences might be moved back the necessary distance, the railway being on its own right-of-way. By this means certain difficulties are lessened if not removed. The maintenance of the common road is not interfered with. Responsibility for accident is definitely removed from the municipality, danger of accident is lessened, and the ordinary use of the highway is less interrupted. On the other hand, the sale of such a strip from the farms changes their boundaries, to which their might be a feeling of opposition, while the control of the railway would be less definitely within the jurisdiction of the municipality.

The roadside, between the open ditch and the fence, is, in many cases, the location best adapted to all interests.

#### SCOPE OF AGREEMENTS.

Local circumstances will, in all cases, suggest the scope to be covered in regulating the use of highways by electric railways. In general, the roads which may be occupied should be specified.

The location of the tracks on the highway should be distinctly specified as a rule, by stating the distance the inner rail

shall be placed from the centre of the road allowance. The placing of switches or turnouts, the laying of tracks across the road, the obstruction of the road in construction, or in making repairs, should be regulated.

The company should make provision for private crossings, present and future, so that property owners may have free access to their land.

The class of construction to be adopted should be specified, the weight and kind of rail to be used, etc.

The company should construct and operate the railway so as not to interfere with ditches or watercourses, nor prevent their future construction under the Ditches and Watercourses' Act, or by the municipality. In certain cases the cost of the necessary work under the track should be borne by the company.

A company will frequently select the side of a road least subject to interruption by snowdrifts. Provision should be made for the removal of snow and ice from the railway tracks, and for the method of disposing of it.

The maintenance of the roadway between the companies' tracks and adjacent to them should be considered.

The erection of poles, wiring, etc., should be within the control of the municipality, and accidents therefrom, as obstructions to the highway, should be definitely assumed by the company.

The municipality should be relieved from responsibility for accident of all kind arising from the construction of the railways and the operation of cars thereon.

Provision should be made for the strengthening, construction and maintenance of new culverts and bridges.

Provision should be made for opening the roadway when necessary, under and adjacent to the track, by the municipality, by a property owner, and by the company.

To no other industry can the old adage that "a stitch in time saves nine," be better applied than to road-building. The smallest hole or depression will soon become a large and expensive one to repair, if neglected. If, on the appearance of depressions, a few shovelfuls of gravel or broken stone are deposited, the passing traffic will soon settle the material in place; but, with neglect, the hole or depression increases in size at an astonishing rate, as water will invariably collect there after rains, will soak into the road, soften the roadbed, and the horses' hoofs will do the rest.

A sure index to the weakest parts of a road is its condition after a heavy rain. Careful examination of those parts of the roadbed where the water collects should be made, with a view to draining the same, either by the placing of proper culverts or ditches, or by leveling up the low spots.