

The joints too are a prolific source of trouble. Many times a hole in a pavement along the track has its origin at a defective joint. The use in the last few years of a 60-ft. rail has helped this situation very much.

Admitting the force of the arguments used herein, it follows that street car tracks do obstruct traffic very materially when in use in streets or roadways. Also that the extent of this obstruction depends upon the amount of existing traffic and location of tracks, being greatest where both tracks and roadway are used to their utmost capacity and the tracks laid in the pavement, and almost nil where traffic is light and the tracks located outside of the pavement proper. Probably no better illustration of the relative traffic capacity of street car and non-street car streets can be given than existing conditions on Jackson Boulevard and either Adams or Madison streets in the Chicago loop district in the rush hours.

In designing, then, a street or road where provision must be made for street car lines, a study must be made of both street car and vehicular traffic, present and prospective, so that the relative importance of each may be determined. As a general proposition the centre of a paved street will be the correct location, but often special conditions may make a different one desirable. In the same way it might be said that on a country road the side location would be most logical, changing somewhat, possibly, when passing through small towns or villages.

Wherever the location the type of construction should be good, variations being permitted according to exact location and character and amount of traffic.

As careful provision should be made for the maintenance of the tracks and pavement to be kept in repair by the street car company, if any, as for the roadway pavement itself. The writer knows that this is often difficult but thinks that unless the company is operating under a franchise giving it special privileges, good results can be obtained by some arrangement. If a new franchise is to be issued, the car company might be obligated to pay a specified amount with the understanding that the highway authorities would keep the pavement in repair. The maintenance of the tracks and road bed must be left to the operating company.

The writer feels, therefore, that if these precautions are taken, that while some traffic obstruction must exist, it will in this way be reduced to a minimum and the general travelling public will be benefitted as much as possible.

#### GRAND VALLEY BOARD REQUESTS COMMISSION FOR FLOOD PREVENTION PROJECTS

At a meeting of the Grand River Valley Board of Trade held last Thursday in Galt, Ont., with representatives present from Brantford, Kitchener, Woodstock, Galt, Waterloo, Waterford, Preston, Hespeler and Paris, W. H. Breithaupt, consulting engineer, of Kitchener, Ont., again presented his scheme for flood prevention on the Grand River.

Mr. Breithaupt declared that disastrous floods such as have often occurred can be avoided by the construction of storage works; also power could be developed. He estimates that a basin with a capacity of three billion cubic feet is necessary. Such a basin has been found in Pilkington township, below Elora. It is 5 sq. mi. in area and would require a dam 1,200 ft. long and 80 ft. high. The provincial government, when approached in reference to the scheme, referred it to the Hydro-Electric Power Commission. While a partial investigation had been made, all necessary data had not been obtained, although 8 years had past. Mr. Breithaupt claimed that a separate commission should be appointed to carry on this flood prevention work. The Board of Trade decided to send a delegation to interview members of the provincial government, with the object of requesting that an independent commission be appointed.

The Soldiers' Settlement Board is laying out a town-site at Prairie River, Saskatchewan, in the centre of a large district which is being opened for soldiers' settlement.

#### METHODS OF INSPECTING RAILWAY BRIDGES

PRESENT bridge inspection methods of railway companies were outlined in a committee report presented at the last annual convention of the American Railway Bridge and Building Association. The report dealt only with inspection as involved in current maintenance from year to year. It was based largely on replies to a questionnaire received from 40 railroads having a mileage of 90,000. An abstract of the report follows:—

##### Inspection of Metal Bridges

An annual inspection of metal structures is more generally in effect than that of any other periodicity, while the officer conducting it is more frequently chosen directly from the staff of the chief engineer than from any other group of officers. The motor car seems to be the most common means of locomotion for the inspection party, and the tools used for metal bridges consist generally of rivet hammers, calipers, rules and tape measures.

Regular forms for taking and recording notes in the field are used by the greater number of railways. These forms are diversified in character, ranging from ordinary mineograph forms to bound notebooks. Some roads require notes to be taken in detail, others contemplate the record being made in narrative form. Many of the forms seem to cover the matter very comprehensively, while others are painfully lacking in provision for adequately making the requisite notes.

By far the greater number of railways make inspection separately, for the various members of metal bridges, and it is probable that the general appearance of the structure and the judgment of the inspector are the criteria as to whether actual measurements are necessary. In most cases, recommendations as to repairs and renewals are made at the time of inspection and are recorded with the notes, but with metal bridges it is more than likely that such recommendations are appended to the inspector's report after mature consideration has been given to conditions reported at the office.

Generally the inspection notes are copied before being filed and the disposition of the notes is extremely diversified. In some cases careful calculations are reported as being the method of determining changes in the carrying capacity of the structure, but in other cases no such calculations or other investigations are customary. Almost all carriers report the practice of comparing records of previous inspections with conditions found, in an effort to determine the progress of deterioration.

##### Inspection of Wooden Bridges

Entirely different results are to be expected from the effects of climate on wooden bridges than with metal structures, but no definite statement can be formulated as to the general effect of climatic conditions in the periodic inspection of wooden bridges, for railroads in the same territory differ as to the frequency of inspection. A tabulation of returns shows the periodicity of inspection and the percentage of total mileage reporting under that periodicity as follows:—

Annually .....	41.55%	Four times annually	2.62%
Semi-annually ....	32.22%	Six times annually	13.11%
Three times annually	5.95%	Monthly .....	4.55%

Nearly 75% of the mileage represented in the replies to the committee's letter of inquiry customarily use the motor car as a means of conveying the inspection party over the line, while only about 21% use regular or special trains. The tools generally used for the inspection of wooden bridges consist of a special inspection bar and testing auger, although in some cases a chisel and brace and bit are added to the tool equipment.

Regular forms for recording inspection notes in the field are used by 85% of the mileage represented in the returns to the questionnaire. Actual measurements are reported as being taken by 52% of the reporting mileage, while general appearance and judgment are used by the remainder. By