# *Maintenance of City Pavements*

By PHILIP P. SHARPLES.*
Manager, General Tarvia Department, The Barrett Co., New York City.

City paving is not confined to the heavy duty types of paving. An examination of the records of any of our cities, large or small, will disclose the fact that a large mileage of cheaper types of paving exists in every city. The City of New York has many miles of macadam streets and their upkeep and maintenance constitutes a problem.

A not uncommon practice for the smaller cities has been to put in expensive pavements in the store sections and perhaps in the best residential sections and then neglect the rest of the city. At the best, poor macadam or gravel streets have been constructed in the outskirts and then neglected on the plea that they were some day to be replaced with a high priced pavement.

The modern theory of roads points to quite a different treatment of the problem. As developed in the best State Highway departments and in the most progressive cities and towns, the task of repairing and maintaining surfacings devolves upon a special treatment. The function of this department is to keep every type of pavement in good repair, not only safe but pleasant to ride over.

The despised dirt road in the outskirts can often be changed from a mudhole scattered with bumps to something passable by the use of a road machine followed by occasional dragging. It is not expensive and the taxpayers cheerfully pay the taxes.

The gravel streets can be improved in the same way and new ones may even be built that give satisfaction, if some of the most elementary rules of gravel road construction are followed. Too often the city engineer regards this problem as beneath his notice or even deliberately neglects it through the mistaken idea that the quicker such streets become impassable, the sooner his department will have the opportunity of putting in a high class pavement.

The maintenance of gravel roads consists in shaping them in the spring with the road machine and then dragging them until hard. Some types of gravel road can be treated with bituminous materials and the surfaces produced compare favorably with more costly bituminous surfaces. Many of the towns of New England, Marshfield and Medfield, Mass.; Sanford, Me.; Charlestown, N.H., and dozens of others have solved their residential street problems by cold refined tar treatments over gravel.

To get a good waterproof surface that will stand delivery wagon and automobile traffic for a fraction of a dollar a square yard is real economy for these places. The bituminous surface is kept intact by skin patching with the same grade of cold refined tar used in the original treatment or by the use of cold patch material mixed before it is used.

The repair and maintenance methods on macadam vary with its condition. A macadam well built in good condition requires only surface treatments of bituminous materials. These may be surface treatments applied hot that produce mats or may be of the cold tar type that actually enter into the road crust and by hardening bind it together and help it support traffic.

The hot surface treatments have been used in park work and have shown great economy but for suburban street treatment the tars applied cold have seemed most suitable. New York has many miles treated in this way and maintained successfully over a long period of years at a very low cast per yard.

The preparation of macadam for surface treatments is an art in itself and the determination of the most economical procedure is a matter of engineering judgment. The choice lies between patching coupled with a simple surface treatment and the more drastic methods of reshaping with subsequent surface treatments of cold refined tar or even the addition of new stone and the building of a penetration top. None of these operations are beyond the skill of a well organized repair department and the cost of even the most expensive work should not exceed a dollar a square yard. Few engineers realize how quickly and cheaply a macadam road may be reshaped and put into serviceable condition by the use of a maintenance roller equipped with a steam scarrifier, followed by bituminous treatment.

The maintenance of bituminous macadam that fills a gap between the high and low price pavements is along the lines laid down for macadam. Patching and surface treatments give astonishing life to penetration work even under rather severe traffic conditions.

The resurfacing and reconstruction of the higher types of paving has already been covered by others. Temporarily they may be cared for with cold patch materials just like the cheaper pavements. Many of the large cities use cold patch even on the most travelled thoroughfares for winter patching or for temporary work until the more permanent repair work can be made. These temporary repairs are regarded as well worth the cost in the comfort they give the public and in the protection they give to the rest of the pavement, before more permanent repairs can be made. Surface treatments are used to seal the tops of porous wood block and in favorable situations to smooth the surface of brick pavements.

The road department in a certain eastern city runs a regular repair crew equipped with a specially designed wagon to take several sizes of cold patch stone and a tank to hold the cold patch bitumen and so arranged that heat can be applied. The crew consists of a good foreman and two men. Except in cases of emergency, the crew takes care of all patching work in the residential districts.

The streets, except the traffic streets, are almost entirely macadam and bituminous macadam.

Let me, in conclusion, put in a plea for systematic maintenance of all types of paving. Every town and city should have its repair crews in charge of good men who will take pride in the work they do.

* Paper read before the City Paving Conference at Philadelphia, October 20-21.