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THE

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The Overloading of Locomotives.

By G. J. Bury, General Superintendent Lake Superior Division, C.P.R.

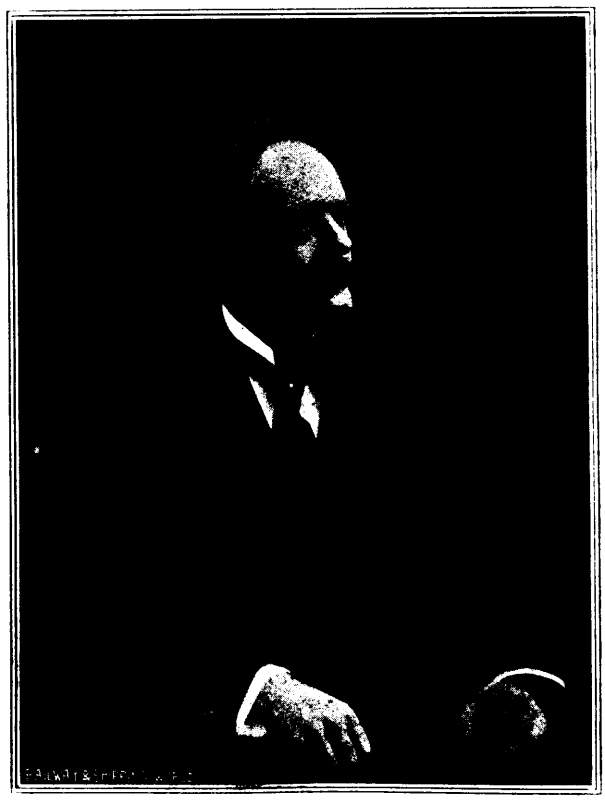
The average trainload in tons on our railways in 1889 was 179.35 and in 1901 it was 281.26, an increase of 101.91. This is due to three causes: reducing gradients, heavier locomotives and heavier loading of engines. These methods have increased the transportation capacity of the railways which adopted them and reduced expenses, but the third method was carried to such extremes that progressive railway managers have called a halt. The overloading of engines is a most expensive practice, occasioning more repairs than ordinarily needed and excessive fuel consumption, it lessens the capacity of a railway, is expensive in overtime and is indirectly the cause of train accidents.

The traffic of but few lines is constant, on the majority of roads fluctuating, by reason of the large freight movement following the garnering of the crops, etc. Officers closely identified with transportation recognize that the fewer additions that have to be made to the staff in moving a certain tonnage the better are the results. If freight trains average 15 miles an hour, train and enginemen in freight service can make 5,000 miles a month, while if the average be reduced to eight miles an hour (and I have known districts where the average was only four miles an hour), the men cannot stand more than 3,000 miles a month. Sixty crews under the former average will make 300,000 train miles in a month, while at an average of eight miles an hour it will take 40 more crews or 200 extra men to handle the same train mileage. Train and enginemen would be content to average 2,500 miles per month during slack season, or, for say eight or nine months in the year, provided they make 4,500 or 5,000 during the remainder. Therefore, when traffic becomes heavy the constant train staff could be looked to to handle double the freight traffic if the engines were loaded so that the former average speed be maintained. The more new men that have to be employed, and the longer hours train crews are kept on duty the greater the risk of train accident, as less care and watchfulness is displayed—and watchfulness and alertness has prevented many train wrecks. A man can only be expected to work a certain number of hours without rest, and when men are a long time on the road their duties are not as well performed as when fresh, resulting in extra fuel consumption, dilatory movements, etc.

Looking at the matter from a financial standpoint, a consolidated engine hauls a train weighing 1,100 tons (tare and contents), over 118 miles in a district where there are several grades of 1% and taking into consideration time meeting trains, and letting faster trains pass, slowing up over grades, etc., averages eight miles an hour, the cost being as under:

Wages engineer and fireman	$6 90
" " overtime	1 75
" conductor and brakemen	7 73
" " overtime	2 88
Oil and waste for locomotive	30
Fuel (7 tons at $3.20)	22 40
	$41 96

Or 32.3 cents per thousand ton miles.



KENNET W. BLACKWELL,

President Canadian Society of Civil Engineers.

The same train, if loaded with 1,000 tons (tare and contents) averages 15 miles an hour over the same district, and the cost is:

Wages engineer and fireman	$6 90
" conductor and brakemen	7 73
Oil and waste for locomotives	30
Fuel (6 tons at $3 20)	19 20
	$34 13

Or 28.8 cents per thousand ton miles.

There is less strain on the engine in hauling the lighter train and engine repairs less, but what the difference would amount to could only be ascertained by actual tests carried over some period.

The economical engine load is variable and is governed, not only by the number and length of grades, but by the density of traffic. On a road where traffic is very light at certain periods and dense at other periods, it might be good transportation to load engines heavily during light traffic, but it would be suicidal to load engines heavily when traffic was dense, even one train staggering and doubling over a district will demoralize the trains following and those met, resulting in overtime, extra consumption of fuel, and the risk of train accident which increases when train and enginemen are long hours on duty. In loading engines it has been the practice on some roads to so load them that they would haul a train at seven miles an hour over the steepest grade. If the steepest grade were of short length, no great delays might result, but if the steepest grade for instance, was to be eight miles in length, an engine, with a run for it, would take one hour to make the eight miles and the longest time it takes to make the distance between two stations is what limits the traffic. With trains loaded in this way, the traffic would be greatly restricted.

In a general way locomotives should be so loaded when traffic is dense that they may make an average speed over a district of 15 miles an hour, providing there are no unusual delays, and while theoretical tests are all very well for a basis on which to work, the only way to arrive at the engine load is by actual tests in practice. After ascertaining what an engine will do in actual practice the load should be shaded slightly from this. No fixed rule can be given for the loading of engines, but the conditions of each district at each period must be closely studied and the load be made such that the train can make reasonably good time. It may be taken as a general principle (providing engines are in good condition) that, where trains are a long time on the road, and the dispatching is not at fault, that the engines are too heavily loaded. A live superintendent will hustle over his district on freight trains, see on the ground where the trouble lies, and fix the load to meet the conditions without delay.

The foregoing paper was read at a recent meeting of the Canadian Railway Club.

The Algoma Central and Hudson Bay Ry. has adopted central standard instead of eastern standard time for operating its trains.