

B

C

=

C
l
o
s
s

f

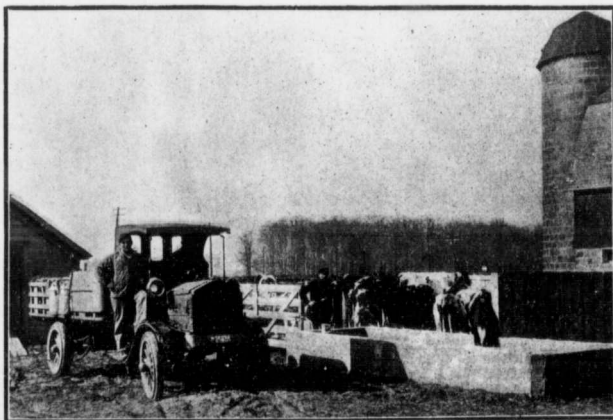
Ontario Department of Agriculture

CO-OPERATION AND MARKETS BRANCH

TORONTO, ONT.

Motor Transportation in Rural Ontario

DONALD R. COWAN and F. C. HART



During the summer of 1919 the Co-operation and Markets Branch of the Ontario Department of Agriculture endeavoured to make a limited survey of Motor Trucking in Rural Ontario. For this purpose a list of some 400 truck owners operating in the rural districts was obtained from the agricultural representatives and from the Ontario Motor License Department. To these owners the following questionnaire was issued:

1. Outline the conditions which led you to believe a truck would pay.
2. Has the operation of your truck so far met your expectations?
3. Size and cost of your truck. How much do you use it?
4. If you have any records of use and cost of operation give summary of same.

5. If you have kept records in detail, give:—

Season's total mileage.
 " " tonnage.
 " " gasoline.
 " " grease.
 " mileage per gallon of gasoline used.
 Usual rate of speed per hour.
 Tire mileage.
 Total cost of repairs.
 Season's cost of repairs per mile.
 Wages paid or credited to motor truck driver.
 Allowance for depreciation.
 Insurance.
 Taxes, etc.

The meagre response to this questionnaire indicated that few owners were able to easily answer these general questions. It was decided, therefore, to interview a number of owners, and the previous impression was confirmed that usually the owners or operators of trucks in Ontario know very little as to the actual cost of operation. A detailed study was continued during the summer. Trips were made with farmer-owned trucks and with trucks operated by transport companies.

In many instances, much valuable information was obtained by requesting the operators to complete the following daily report card:

Driver's Daily Report Card

Date191
 Truck No.

OUTBOUND.

Leaveat..... A.M.
 P.M.
 Arriveat..... A.M.
 P.M.

INBOUND.

Leaveat..... A.M.
 P.M.
 Arriveat..... A.M.
 P.M.

Total mileage for day.....
 Total load outbound lbs.
 Total load inbound lbs.
 No. of delivery or pick-up stops
 Hours with helper cost.....
 Gasoline usedgals. @..... c
 Oil used pints @..... c
 Grease used lbs. @..... c
 Cost of repairs (if any)
 Time laid up for repairs hrs.
 Ferries and tolls
 Hours not running Reason

Tires changed { Front { Right.....
 { Left.....
 { Rear { Right.....
 { Left.....

Reasons for removal

Condition of roads

Remarks

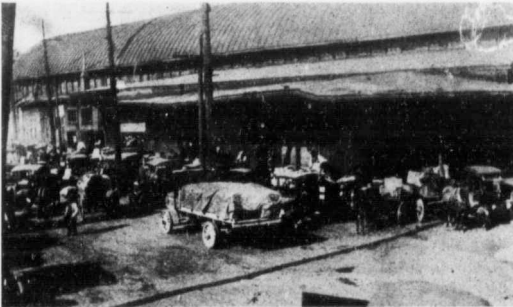
Driver

In order to illustrate the condition of rural motor trucking in Ontario at the present time the experiences of operators will be valuable. Besides the farmer who markets his own produce with his own truck, there are at least three other classes engaged in rural hauling by motor truck—(1) the regular motor truck operator whose income is derived from his motor trucking business, (2) the farmer who hauls for himself and his neighbors, (3) the Co-operative Farmers' Associations owning and operating a motor truck.

The experiences of operators which follow are grouped according to the type of farming in which the owners are engaged:

FRUIT GROWING.

A fruit grower at Aldershot says: "My truck is of 1-ton capacity which I overload at least 50 per cent. This truck has a forty horsepower engine, full electrical equipment and pneumatic tires; it will carry fruit without damage. I regret that I have no figures to give, but will give my honest views on the subject.



Trucks at the Toronto Fruit Market.

My reasons for investing in a truck are many. The horse is too slow on the road, labor is too expensive and time too valuable to sit on a wagon and wait for a horse. I can leave the farm two hours later than formerly and be on the market just as early.

Three years ago the truck cost \$1,750. The season's mileage is about 3,000, and I estimate the cost of operation at about 10c per mile.

I live six miles from Hamilton on the Toronto-Hamilton highway. I would not do without it in my business for a great deal more than it cost me."

A fruit grower near St. Catharines says: "I have thirty acres of grapes and six acres of peaches. This means a great deal of hauling to shipping points in a short time when speed means money. At some shipping points the dealers pay much better prices, but with considerable distance to haul to those points, a team would be out of the question especially at a busy time. My truck is a 1-ton one, with body and shock absorbers. It cost \$1,025, and is in use almost every day. I get twelve to fifteen miles from a gallon of gasoline; the rate of speed is from ten to twelve miles per hour. I figure the depreciation on the truck at 25 per cent. per annum."

Another fruit grower near St. Catharines writes as follows: "The roads in my district have been paved. The faster the fruit ripens, the faster and oftener I have to go to the shipping stations. I formerly used a horse, and as the weather became hotter the fruit ripened faster, but the horse had to travel slower because of the heat. As the season for shipping lasts only about five months, I had to keep the horse in idleness for the remainder of the year. If I had a heavy crop I used up the horse in a season in spite of the fact that I am near the shipping points. I have now substituted for the horse a runabout, with box attachment, which carries about fifty eleven-quart baskets. I can now go twice to the shipping point in less time than the horse could go once with no time wasted in hitching horses, walking home and the like, and I have more time to pick and pack fruit. The truck is also valuable in an emergency during spraying; when breaks occur the repairs are quickly obtained from the factory; besides I can go direct to the nurseries for trees, and my little truck has more than met my expectations. I have no records of operation."

A grower of strawberries, small fruits and onions near Ingersoll has a 1-ton truck which has made it possible for him to sell his produce on five markets, namely, St. Thomas (35 miles distant), London (20 miles), Stratford (35 miles), Woodstock (10 miles), and Ingersoll (1 mile). Previously his largest market was Ingersoll, and this is now his smallest market. The marketing of two acres of onions gives his truck employment in the autumn months. This spreads the operation of his truck over the whole season and adds to its economical operation.

Note.—It was found that the use of trucks in sections of Ontario devoted to the growing of grapes and peaches was not very extensive. In the vicinity of Queenston and St. Davids, in the Niagara district, very few fruit growers used trucks. The reasons given were: (1) The marketing season lasts for only six weeks; (2) the rows in the orchards are too close together, the ground is too rough and the fruit picking too slow to make anything but a horse and wagon economical in gathering the fruit, and while on the same conveyance it may be transported to the shipping station; (3) usually the roads are not smooth enough to truck fruit. Indications, however, point to an increased use of trucks in fruit districts. Fruit for the canneries is now gathered by large trucks. In the Niagara district, around St. Catharines, where a variety of fruits is grown, the small truck is at present more commonly used.

FRUIT AND VEGETABLE GROWING.

Between the farms devoted exclusively to fruit growing and those devoted exclusively to vegetable growing, there is a class which produces both fruit and vegetables. A farmer in this class owning a 140-acre farm fifteen miles from Toronto has used a 2-ton truck for seven years in hauling potatoes, apples, strawberries, tomatoes and other products to Toronto. Before the purchase of the truck it required three men and three teams to place on that market the same amount of produce as one man in two trips can now haul with the motor truck, and the work can be done in shorter time. The teams used to leave the farm at 2 a.m. and they required all day for the trip. Now the truck leaves at 7 a.m., returns before noon, takes the second load in the afternoon and completes the work by 6 p.m.

The experience of the owner of a fruit store at Cobourg is of interest. This owner rents small plots of land of two or three acres in extent; some of these plots may be as much as twenty miles apart, because they are rented from farmers who

undertake to manure heavily. On these plots the renter grows vegetables and fruits. A truck (with trailer sometimes attached) is used in managing the plots and hauling the produce to his own store and to such markets as Peterboro, Kingston and Toronto. In marketing at these places an endeavor is made to obtain a return load, and an illustration of one such trip is given. On September 15th, 1919, the owner and a helper left Cobourg at 2 a.m. and arrived in Toronto at 10 a.m., covering seventy-two miles. The load consisted of 116 eleven-quart baskets of tomatoes, 1½ tons in weight. The return load consisted of as many baskets of peaches and grapes. The express charges on the material handled would have been \$45. The owner estimated his costs by truck as follows:

12 gals. gasoline @ 58c.	\$4 56
4 qts. oil@ 25c.	1 00
2 men's wages	8 00
Depreciation on truck	4 00
Total	\$17 56

Placing his total expenditure at \$20 he estimated a saving of \$25 on the trip.

Moreover, by the use of the truck, the cost and inconvenience of hauling the tomatoes to the train, loading them and the unloading of the peaches and hauling to the store were eliminated. A further saving was accomplished by selling and buying on the fruit market in person. It was estimated that the tomatoes were sold at least 10c per basket above the price obtainable when shipped by train, and the grapes and peaches purchased at from 10c to 15c less. It was possible also to inspect the fruit before purchasing. The experience of this one trip illustrated the possibility of decreasing the cost of marketing and of placing in the hands of the consumer, fruit in better condition and at a lower price.

VEGETABLE GROWING.

(1) A vegetable grower living four miles from St. Catharines now owns a runabout with a box attachment, large enough to carry 110 six-quart baskets. On the morning of July 18th, 1919, he was the earliest producer on the St. Catharines market, although he was farther away from the market than many other vegetable growers. His truck was loaded with beets, carrots, cauliflower, cabbages, early potatoes and some small fruit. At 9.45 a.m. he had sold three-quarters of his load, and leaving his fourteen-year old son to sell the remainder, he returned home for a load of the vegetables which he found to be commanding the best prices. He arrived on the market with a second load at 11.45 a.m., and later made another trip to his farm for some special orders. During that forenoon he sold almost three times as large a quantity of produce as those farmers who came with wagons. Furthermore, on his second trip he was able to bring those vegetables which were in greatest demand. During the afternoon he took a load of vegetables to the hotels at Niagara (12 miles from his farm), making the round trip in less than two hours.

(2) A vegetable grower near Leamington gives the following information: "I used a 1,000 lb. capacity truck last season, and it served me so well that I bought a 1-ton truck this spring, and I find it almost a necessity. I do all my road hauling with it. In hauling manure, for instance, I can do the work of two teams on a two-mile haul, and on longer hauls I do even better. I make trips to Detroit and Windsor, a distance of thirty-five miles each way, for which a team of horses is entirely out of place. My season's mileage last summer, with a small

truck, was about 2,000 miles, gasoline used 109 gallons, grease 10 lbs., giving an average of twenty miles per gallon of gasoline; average speed with load, eighteen miles, without load, twenty miles; pneumatic tire mileage, average, 6,000 miles, repairs (not including tire repairs), \$8. I do not consider the depreciation of my truck to be over \$150. This truck is merely a touring car chassis with a delivery body. I am keeping a close record of my new truck, and could give you a detailed estimate at the end of the season. Besides road hauling I use my truck on the farm, hauling all my tomatoes, onions, potatoes, cabbage, and other vegetables, from the field to the packing house, and I have found it a great convenience and time-saver."

(3) The Essex Growers, Limited, onion producers near Leamington, own a 1-ton truck, used chiefly for hauling onions to the shipping point and fertilizer to the farms. The round trip to the shipping point is fifteen miles; the truck, although only of one ton capacity, will make six trips in eight hours, and in that time will load a freight car of 30,000 lbs. capacity. Ten or eleven hours used to be taken by three teams making two trips each to load the same amount of onions. Teamsters charged \$5 per team per trip. In other words, it cost \$30 to load a 30,000 lb. car by team-drawn vehicles. The manager of the company stated that he obtained at least twelve miles per gallon gasoline from his truck, and that his repair bill for loading a car was not over \$3. Allowing his truck driver \$4 per day, and \$8 per day as a liberal estimate for fixed charges, his total cost for loading a car of onions by motor would not be over \$15, thus saving \$15 each load.

Note.—On the St. Catharines market on the morning of July 18th, 1919, there were sixteen ordinary pleasure cars, nine motor trucks, all of which were not over 1-ton capacity, and about forty horse vehicles. At least 60 per cent. of the vegetable and fruit growers on the market had trucks. The great majority of the horse vehicles were loaded with butter, eggs and poultry from general farms.

On the Welland market on September 20th, 1919, there were seven trucks as compared with sixteen pleasure cars and sixty horse vehicles. Practically all the trucks were from the vicinity of St. Catharines.

On the St. Lawrence Market, Toronto, on October 4th, 1919, there were sixty-one wagons, nineteen automobiles, and nineteen trucks.

Every owner interviewed voiced the opinion that in addition to the truck being cheaper for hauling large quantities of produce, the more important economy was effected in allowing the producer more time for work on the farm.

BEE KEEPING.

A comparatively large proportion of the commercial bee-keepers own small trucks or light delivery trucks with trailer attachment, and the general experience of these men may be summed up in the following: "From a bee keeper's standpoint we have had considerable experience with a truck, although we regret that we have meagre records to indicate the cost of hauling. The bee-keeper's first reason for buying a truck lies in the fact that the bees will not sting it. The truck makes the bee-keeper independent of teamsters, because he has not enough work to make it worth while to keep a team, and yet he has a great deal of small trucking to do; his road work is only in summer when trucks can be operated, and he avoids the care of a team during the inactive season. Then, of course, a saving of time on the road is very important. Our 1-ton truck fully equipped cost about \$1,000. While it might not stand the punishment that some of the more expensive machines might stand, I consider it to be the best for the bee-keeper

beca
line,
carry

Cour
100
thinl
was
of c
mad
leng
colle

cond
That
all u

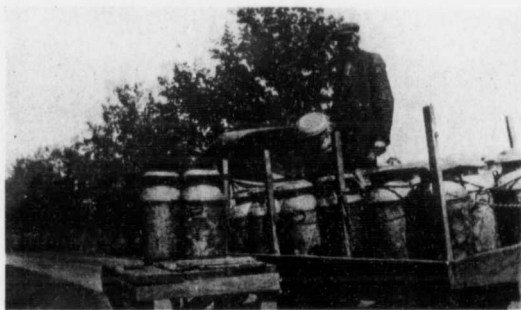
Cent
forty
gaso
truel
set o
of tl
work
year
addi
are 1

because of the short season. We travel about 360 miles on forty gallons of gasoline, and this is about all the records we have. We find it a great convenience in carrying bees and honey to and from the various apiaries."

DAIRY FARMING.

(a) *Marketing Cream by Truck.*

A large concern in London, Ont., which buys cream and milk in Middlesex County uses a 1-ton truck to gather cream. The farmers are paid 18c less per 100 lbs. than if the cream were laid down at the factory, but the manager did not think that this charge nearly covered the cost of collection. Very frequently it was necessary to travel from twenty-five to forty miles in order to collect one ton of cream, and the cost of doing so was estimated at about double the allowance made. The difficulty lay in the necessity of frequent stops at each farm, the lengthening of the route in reaching each farm, and the small amount of cream collected at each stop. The route was not organized with collecting stations.



Co-operatively owned truck operating from Unionville, Ontario, picking up the milk of a shareholder.

Creameries in the southern part of Oxford County in competition with condensed and powdered milk factories have had practically the same experience. That is to say, it appeared doubtful whether the creamery could obtain cream at all unless it were collected by truck, and the trucking done at less than cost.

Another example is that of a creamery operating without competition in Central Ontario. This creamery has three 1-ton trucks, each of which averages forty miles per day. On the trips of forty miles, each truck uses five gallons of gasoline and two quarts of oil, repairs (exclusive of tires) average about \$100 per truck each season. Three sets of pneumatic front tires every two years and one set of hard rear tires every three years were worn out on each truck. The manager of this creamery spoke as follows: "It would take at least five teams to do the work of our three trucks, and these teams would have to be changed every three years. A horse must have a gallon and a half of oats per meal, and with hay and oats at present prices it would cost more than \$1 per day to feed a horse; in addition horses have to be shod, the wagons kept in repairs, and two extra drivers are needed, as most of the business is done in summer, and the territory covered

by the creamery very large. The truck is the only method by which we can hold our patrons."

(b) *Marketing Milk.*

It would appear from experiences of owners that the truck is more useful in the marketing of milk than in the marketing of cream. A large part of the milk consumed in Toronto and Hamilton is marketed with trucks operating within a radius of thirty miles. At Toronto the rate per can ranges from 20c to 25c, according to the distance hauled. From certain points this rate is more than railway express rates, but the truck is proving more economical because it hauls direct from the farmer's gate to the dairy in Toronto. The large condensed and powdered milk concerns in Oxford County have effected a considerable saving by the use of 2½ and 3½-ton trucks for collecting milk from receiving stations. The effect of the condition of the roads is illustrated in connection with milk trucking, as previously stated. Where roads are good as around Toronto, milk is being economically hauled by truck. An instance of the effect of roads is seen at the city of Welland, which is supplied with milk collected in wagons along three routes ranging from twelve to twenty miles in length. The rate for hauling is 30c per can, and is higher than that charged at Toronto and Hamilton. An endeavor was made to replace these teams with trucks, but because of the clay roads their operation was found impracticable.

A similar situation obtains in one part of Oxford County. The city of Woodstock is in the centre of an important milk-producing section of Ontario. At this city, for instance, there are two dairy plants, one of which has a branch at Embro, a few miles away. The smaller dairy has no milk routes, but each farmer hauls his own milk. The larger dairy, which receives about 800 cans of milk per day in the flush season has ten wagon routes. The branch at Embro has one large route. On these routes the cost of hauling is from 9c to 15c per 100 lbs, according to the length of the haul. The highest rate is 15c per 100 lbs. for seven miles, or 2 1-7c per mile. (The rate for motor hauling at Toronto and Hamilton averages about 1c per mile.) The manager of one of these dairies and the teamsters hauling milk were asked why the routes were not combined and 1-ton trucks used. The reasons given were: (1) The winters were too severe to allow trucks to be used. (2) The roads were in such bad condition that trucks could not profitably operate except during a short time in the summer. (3) The truck represented too large an investment for the short time in use. The improvement of the roads is the main consideration.

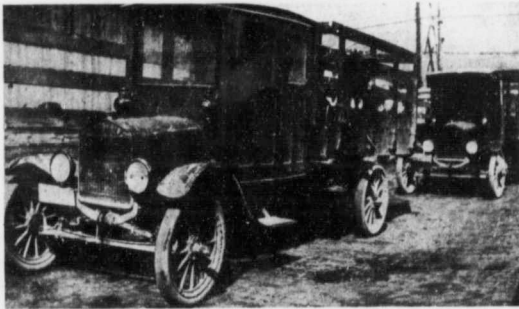
GENERAL FARMING.

The following are examples of experiences of general farmers with trucks:

(1) "I raise live stock and some fruit, and have a 1-ton truck costing \$1,470. I have carried as much as three tons at a time. My usual rate of speed is from eight to twelve miles per hour. I have not kept records of the cost of operating, but have a large amount of hauling to do, my nearest town being Leamington, six miles distant, with Windsor thirty-five miles and Essex ten miles. It is doubtful whether the average farmer can make a truck of this size pay because of the large costs of depreciation, tires and gasoline. While this truck has met my expectations, I expected that it would be costly to operate. The most practical truck for a farmer is a runabout, with a box attachment holding ten to twelve bushels. I have had one of these for years, and would not like to do without it. I am not certain that I will ever buy another large size truck."

(2) "I have not used a truck, but have a trailer for my car with a carrying capacity of 1,500 lbs. I have work enough for two cars, and as we are twelve miles from the railway station, I concluded that a trailer would answer the purpose, and have found it very satisfactory. The trailer cost \$115, and the repairs are light. Besides, the trailer has caused little expense in repairs for my motor car. This is the sixth season for it, and it still gives satisfaction. I draw at least a ton a week, twelve miles each way. For the average farmer who does not have to contend with steep hills I believe a trailer with a good strong rack will answer the purpose of a truck."

(3) "We are breeders of Shorthorn cattle and Berkshire pigs, and have been running a small truck for two years. In my opinion the question is mainly a matter of roads. Very few farmers in Ontario, except those hauling milk daily, or growing fruit, or hauling for others, can make a financial success of a truck. I doubt if there is a place for a truck on a one-hundred or even a one-hundred and fifty-acre farm unless under special conditions."



Delivering Live Stock at the Union Stock Yards, Toronto.

(4) In connection with a 380-acre general farm producing grain, live stock, potatoes and vegetables, situated sixteen miles from Toronto, a 2-ton truck is in operation. Everything except bulky products, such as cattle and hay, is marketed by truck. On an average one trip a day was made to Toronto during the past year. It made possible the marketing of twenty-six acres of potatoes direct to the wholesaler and retailer. During the summer two trips per week were made to Toronto with vegetables, and when seen on one occasion at the fruit market the truck was loaded with 120 eleven-quart baskets of tomatoes. The smaller live stock, sheep, pigs and calves, are trucked directly to the live stock market, cars of grain are loaded at the local station $1\frac{1}{2}$ miles distant, and on the farm itself, turnips, grain, corn and manure are hauled.

LIVE STOCK MARKETING.

In 1918 a beginning was made in hauling hogs by truck to the Toronto Live Stock Market. At the present time fully three-quarters of the hogs produced within a radius of twenty-five miles from Toronto are marketed by truck. At the Union Stock Yards and abattoirs, calves and sheep are also marketed by truck.

The following gives a summary of the opinions advanced by farmers, packers and truck owners:

(1) The rates per 100 lbs. by truck range from 30c to 60c, according to the distance, and size of the load.

(2) The farmer gets the correct weight for his live stock.

(3) The farmer obtains the exact selling price of his stock less cost of transportation, eliminating the drover's cost of 50c to \$1.50 per 100 lbs.

(4) The shrinkage by truck is about half the shrinkage by train, due to the shorter time in transit, better usage, and proper feed and watering.

(5) The time of placing the stock on the market can be timed to better advantage by truck than by train.

(6) The abattoirs prefer a hog shipped by truck because of less bruising in transit.

(7) When the price on the market is high truck loads of live stock may be rushed to market to take advantage of these high prices, and an immediate supply obtained, which has a tendency to keep prices level.

(8) At present the cost of transportation by truck per ton-mile beyond a thirty mile radius is much greater than the railroad rates, and the advantages conferred by the truck beyond the thirty miles are offset.

TRUCKING FOR FARMERS.

There are a number of motor-truck owners who derive their incomes largely from conducting motor-truck business in rural districts. One such operator situated twenty miles from Toronto has a 1-ton truck with stake body. He has a regular daily service on a round trip of sixty miles. On an average he hauls thirty cans of milk, together with fruit and vegetables in season, butter, eggs, calves, lambs and hogs. These extras are placed on an upper deck, which can be removed at pleasure. He never fails to have a return load, carrying fruit, groceries, lumber, furniture and other freight, for the country merchants and farmers. In addition he frequently makes a special trip to Toronto after 3 p.m. He receives 30c per can for milk, 25c per 100 lbs. for groceries, 45c-50c-55c-60c per 100 lbs. for hogs, depending on the distance, size of the load and accessibility of the farm. He states that \$350 is a conservative estimate of his gross earnings per month.

An outstanding example of a private enterprise is that of an operator near Hamilton with a 3½-ton truck, who hauls 100 cans of milk and twenty-five small cans of cream for a round trip of thirty-two miles. He charges \$6.50 per can per month, and he pays the dairies to whom the milk and cream is delivered 5c per farm per month to do his accounting and deduct his charges from each farmer's monthly milk returns. The operator never leaves his main route, but the farmers meet him with their milk at stops along the main road. In addition there are one or two "feeders." The operator pays one man \$2 per morning for collecting thirty cans of milk and ten cans of cream along a 4½-mile route; these are transferred to the large truck on the main road.

On the return trip the operator hauls freight for the storekeepers of two towns. For this service he charges 25c to 30c per 100 lbs., making a gross income for this work of from \$8 to \$15 a day. Frequently extra trips are made to other towns. In addition he is obtaining considerable revenue in raising his own hogs, fattened on sour milk obtained free, except for the cost of hauling. This milk has been refused by the dairies, and the farmers refuse to pay the transportation charges against it.

Note.—Many farmers own a motor truck in spite of the fact that they are unable to use it to capacity. Such farmers have gradually begun to haul part or all of their neighbors' produce to market and occasionally this practice has led to the establishment of a regular route. The motor truck as a community institution will be increasingly important. Such a practice is susceptible of expansion, and the farmer operator is usually in a position to offer reasonable rates. Farmers needing a motor truck for part time service should investigate the possibilities for business in their community.

CO-OPERATIVE TRUCKS.

Present information would indicate the existence of only one co-operatively-owned truck in Ontario. This truck is owned by an Association of fifteen farmers, and operates on a route starting from Unionville, thence to Hagerman, then around a block of five miles, and thence to a dairy in Toronto. The round trip is fifty miles. The ownership of the truck was divided into \$50 shares, and only two shares could be bought by one farmer. A 1-ton truck costing \$1,200 began operation on May 6th, 1918, and discontinued on December 31st, 1918. Each farmer concerned took his turn, during the winter, in hauling the milk by team. On March 2nd, 1919, the truck was again put in operation. About eighteen miles per gallon of gasoline was obtained with a speed of from twelve to fourteen miles per hour. The truck hauled from thirty-five to forty cans of milk per trip, for which the Association charged its members 25c per can and non-members 30c per can. The truck earned the driver's wages at \$1.75 per day, and paid for itself and some incidental expenses in the first nine months of operation.

Note.—In spite of the excellent showing this Co-operative concern might be criticized on the following items:

- (1) It does not keep a proper system of accounts, showing fixed charges such as interest, depreciation, overhead, and other expenses.
- (2) No method of dividing the profits now accruing has been adopted or can be adopted until a system of accounts has been installed.
- (3) The Association does not haul return freight, and thereby loses much revenue which could be obtained at a small additional cost.

FACTORS INFLUENCING THE COST OF TRUCKING.

From the foregoing it will be seen that very few actual cost figures applicable to Ontario are available. From the limited study made we are convinced that owners of trucks should have a clearer conception of costs, and the following part of this Bulletin is designed to give some idea of the factors entering into the cost of using a motor truck.

Of these factors, those under the control of the operator include the driver, tires, gasoline, overhaul and repairs, depreciation, insurance, interest on investment and garage. Those more or less determined by outside influences include the size of the truck, size of the loads, rate of speed, condition of roads and weather.

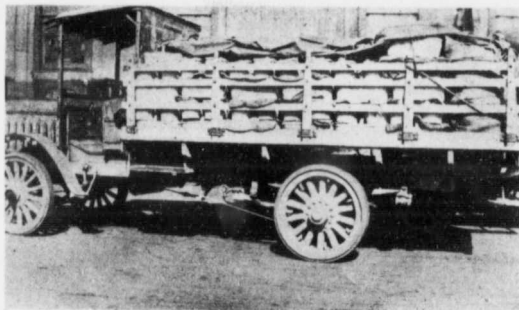
The first cost of a motor truck, whether high or low should not be the only consideration; rather the first consideration should be the transport of freight at the lowest cost. In the determination of these costs the first cost of the truck

does not appear so important when it is realized that from four to five times the amount of the initial cost will be spent during the life of the truck for operation and maintenance.

THE DRIVER.

Frequently the operator of a rural express route finds it impossible to make the business remunerative until he undertakes to drive the truck himself. The efficiency of the driver and his proficiency in caring for the truck is a most important element of costs, and in order to obtain this efficiency trucking companies employ more or less elaborate systems of bonusing drivers.

A closed cab and self-starter are aids in efficiency of the driver. A cold and uncomfortable driver will be less likely to be careful of small details in the care of the owner's truck, the consumption of gasoline, care of tires, and the courteous treatment of customers. A tired driver is apt to take unnecessary risks. The problem of cranking a motor even twenty-five or fifty times a day weighs with a driver. It is easier to let the motor run while loading and unloading, thus increasing the



Two and one-half ton truck on Rural Motor Express.

consumption of gasoline. The cost of time used in cranking is not often realized. It takes from two to four minutes every time the driver leaves his seat to crank before he can be on his seat again with the truck in motion. It is evident that the driver would have to crank only twenty times during the day in order to incur a loss of one hour's time, valued at from \$2 to \$4. The two or three minutes is unimportant in casual trucking, but for continuous trucking the \$2 to \$4 a day is worth considering.

The efficiency of the driver affects:

1. Miles travelled.
2. Pounds or tons carried.
3. Time consumed.
4. Tire expenses.
5. Maintenance and repair expenses.
6. Amount of gasoline, oil, and grease used.
7. Time used in loading and unloading.

Where the truck is operated for public transport, the ability of the driver to obtain business for the owner is also an important consideration. An empty truck is always an expense.

TIRES.

The cost of tires is not included in the initial cost of the truck upon which the depreciation is figured because the tires depreciate much more rapidly. The factors influencing the life of pneumatic tires are:

1. Under inflation.
2. Overloading of truck.
3. Over inflation.
4. Skidding around corners.
5. Excessive speed.
6. Locking of brakes.
7. Misalignment of wheels and wobbly wheels.
8. Lack of attention to cuts, blisters, and stone bruises.
9. Oil and grease rotting the rubber.
10. Winter care when not in use.

For solid tires the worst enemy is overloading of the truck. When rubber is stretched beyond the tensile strength it does not contract to the original condition, and one overloading beyond this tensile strength ruins the tire. Running on car tracks, skidding, misalignment of the wheels, and the like should be avoided. Solid tires should be removed when worn to within one inch of the rim of the wheel. Beyond that point the vibration of the truck is excessive, and this increases the repair costs. Whether to use solid or pneumatic tires depends on:

1. Size of truck.
2. Class of service of the truck.
3. Condition of roads.

For trucks up to 3,000 lbs. capacity and for 2-ton and 2½-ton trucks hauling fragile freight (such as rural express hauling farm produce) the pneumatic tire gives the most economical service. On the larger sized trucks pneumatics are called for only where the class of service covers long hauls where speed requirements are high. When hauls are of normal length more can be gained usually by speeding up the terminal handling than by the vehicle on the road.

The following is a comparison of the operating cost in city traffic of two trucks of the same make and size, one equipped with solid tires in the rear and pneumatic in front, the other with pneumatic both rear and front, and operated for six months.

	Solid.	Pneumatic.	Saving by pneumatic.
Miles travelled	4,800	6,000	
Truck repair costs, \$	129.55	63.09	\$66 46
Gasoline used	1,812 gals. (@ 35c).	1,320 gals.	172 20
Oil used	504 qts. (@ 25c).	360 qts.	36 00
Wages (covered 25% more ground with pneumatic tires)			161 50
Depreciation	3c. per mile.	1c. per mile	84 00
		Total	\$520 16

The above would indicate that under suitable conditions the pneumatic tire is economical. The limiting factor, especially in the country, is the condition of the roads and their effect on pneumatic tires.

The advantages of pneumatic tires are:

1. Reduction in mechanical repairs.
2. Increase in permissible speed.
3. Decrease in gasoline consumption.
4. Decrease in oil consumption.
5. Less vibration and therefore less fatigue for men.
6. Lessened depreciation of roads.
7. Greater tractive ability.

Disadvantages of pneumatic tires:

1. High initial cost, compared with solid tires.
2. The need of carrying emergency equipment.
3. The difficulty of changing tires on the road, due to weight and high inflation pressure required.
4. Reduction of the high gear ability and limitation of the total ability, due to greater diameter of wheels.
5. Limitations imposed on the size of brakes, due to the small size of wheels.

GASOLINE AND OIL.

The amount of gasoline consumed and the mileage per gallon obtained are important considerations. Under any given conditions such as condition of roads, size of truck, kind of tire, load, etc., the amount of gasoline consumed depends very largely on the driver. He may reduce consumption by:

1. Coasting down hill.
2. Coasting before stopping.
3. Seeing that no brakes drag.
4. Keeping spark plugs clean.
5. Keeping compression in cylinders perfect.
6. Having carburetor properly adjusted according to atmospheric conditions.
7. Choosing best traction surface on the roadway.
8. Stopping the motor when loading and unloading.

Under average conditions a truck should use on average roads:

Truck Capacity	Gasoline	Oil
Tons	Miles per gal.	Miles per gal.
$\frac{1}{2}$	13 to 15	200
1	11 " 13	200
$1\frac{1}{2}$	9 " 12	180
2	8 " 11	175
3	6 " 8	150
$3\frac{1}{2}$	5 " 6	150
5	4 " 5	100

OVERHAULING.

A new truck should be completely overhauled when driven about 1,000 miles. The valves should be reground, nuts tightened, and all adjustments made. The amount of later overhauling depends on the strenuousness of the work performed by the truck, and the continuous care given by the operator. Minor adjustments or minor defects should be given attention immediately. A daily inspection should reveal these minor defects. The frequency of general overhauls depends to some extent on whether the owner does his own garaging or uses a public garage. In choosing between the two, the main consideration is the ability to keep the truck in operation the greatest possible time each year. Generally speaking the more trucks a man owns, the more economical it is to do his own garaging. In any event the general overhaul should not be neglected. Even if costs of driver, tires, and gasoline are excessive the truck can still be operated, but if repair work is neglected the truck may necessarily be withdrawn from use at a busy time, with a considerable loss of revenue.

DEPRECIATION.

Too many truck owners in Ontario do not give due consideration to the depreciation cost, and are under the impression that they are operating at a profit. In reality these imaginary profits will be suddenly wiped out when a new truck must be purchased.

Rate of depreciation depends on the class of work performed, roads, loads, speed, maintenance and other factors. A truck operated with good care, over paved roads or streets, with no overloading, may last for eight or ten years, while the same truck carelessly operated, overloaded, over heavy roads, may last only three years. Yet the owner must estimate in advance the rate of depreciation. It is preferable to underestimate the life of the truck. This allowance should be included in the cost of operation.

Usually the method is to assume the life of the truck to be five years (or 100,000 miles) and charge 20 per cent. of the cost (less tires) each year. In fact, of course, depreciation is not uniform. The depreciation in marketable value of a new truck during the first year is usually not less than 50 per cent., though its depreciation in capacity for work may be less than 20 per cent. Repairs and depreciation charges should not be confused. Though repairs increase the life of the truck, the time will come when it would be cheaper to buy a new truck than to continue spending money on repairs. When this time comes the owner should have a fund from which to replace the old truck.

INSURANCE.

There are five separate kinds of insurance on motor trucks:

1. Liability.
2. Collision.
3. Fire.
4. Theft.
5. On goods carried.

Of these the *liability* is the most important. There are two classes of liability insurance, (1) Insurance against injury to persons, (2) Insurance against damage to property. The first class protects both the owner and the driver from paying damages for personal injury up to a certain amount. The second class covers damage done by the truck to another person's passenger car, truck, buildings, or other property. The courts have held that when a business vehicle has been injured the owner can collect from the insurance company damages for the loss of its use during the time it is being repaired. Owners should see that their policy includes a clause covering such a contingency.

Collision insurance covers only damages sustained by the insured's truck and does not cover damages inflicted. The owner should, therefore, understand that in purchasing collision insurance he is covering only the damage to his own truck. There are three classes of collision insurance, (1) Full coverage, (2) one hundred dollars deductible, and (3) fifty dollars deductible. The first covers loss up to the full amount of the policy. The second does not pay for a loss which is less than \$100, and if the loss is more than \$100 the insurance company will pay the amount of the loss, less \$100. In the third class the loss is paid less \$50.

Theft and collision policies should be taken out in the one company. A situation may arise where a motor is stolen and damaged in collision while operated by the thief. The company carrying the theft insurance may maintain that the loss

is due to the collision and should be collected on the collision insurance. The second company may maintain that the loss is due solely to the fact that the truck was stolen. Trouble and expense may be incurred in the dispute. With the two policies in the one company there is no reason for delay in settlement.

On liability, collision, fire, and theft policies the rates are determined according to:

1. The class of business;
2. Cost of truck and its age;
3. The particular business in which the truck is engaged;
4. The particular locality in which the truck is operated.

Insurance on *goods carried* may be either blanket insurance on all loads carried in a given period of time, or insurance on a certain load carried between two places at a certain time.

Usually the average truck owner does not understand that when an insurance company pays a loss it is not deducted from the policy. His insurance is for the full limit of the policy for each loss after the previous loss has been settled, unless there is a clause in the policy which specifically states that only one loss shall be settled. When losses become too frequent, the company may presuppose carelessness and cancel the policy.

Along with insurance on goods carried it is necessary to use a bill-of-lading in order to show the value of goods lost at any time.

Trucking, like any business, has its risks, and the cost of carrying these risks is a necessary and legitimate charge included in the cost of hauling.

INTEREST.

Of all the items in the cost of operating a truck that covering interest on the investment is the one usually neglected by the small truck owner. It may equal the cost of lubrication or even repairs when the truck is comparatively new and may mean the difference between profit and loss in operation.

When there is no sinking fund with which to purchase a new truck, interest may be figured at 6 per cent. on the original investment each year. When there is a sinking fund earning interest, the 6 per cent. on the original investment is excessive by the amount of the interest earned by the sinking fund.

GARAGES.

Inadequate facilities in the garages tend to increase the cost of truck maintenance and operation. They delay the entrance and exit of trucks, make repairing difficult, and as a rule lower the efficiency and morale of the drivers. These costs do not appear directly, but are nevertheless real. Continuous operation of a truck may cost \$20 per day, and of this from 50c to \$1.50 will be the cost of storage. This cost might easily be increased if facilities for supplying gasoline and oil, for cleaning and washing the trucks, for repairing, and for easy entrance and exit, are not provided.

COST ACCOUNTING.

Truck costs are of value from the following points of view:

- (1) To determine the cost of truck haulage as compared with other methods of shipment.
- (2) To determine the rates to be charged when truck is used in public haulage.
- (3) To compare cost of operation of one truck with that of another or to determine when any one item of truck expense is excessive.

Without records for the determination of his truck costs, an owner is operating on a purely speculative basis. The records of operation supply him with the facts and make possible the knowledge of whether the truck is being operated at a profit or at a loss.

Below is given a sample of records taken from the *Commercial Vehicle*, a valuable truck magazine published in New York City:

FRONT

Driver's Report Card

Vehicle No. Date 19

Driver Left Garage
 Route No. Returned

TRIP LOG

From	To	Lbs., Tons, Pkgs., or Stops		In
		Out	Del.	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

SUPPLIES

Gal. Gas.
 Qt. Oil
 Lbs. Grease
 Other Supplies

TIME

Driver
 Helper (s)
 Washer
 Mechanic

Signature

BACK

Driver's Mechanical Report

(Repair Men will correct all troubles)

<p>MOTOR</p> <p>Ignition</p> <p>Carburetor</p> <p>Cooling</p> <p>Lubrication</p> <p>Valves</p> <p>Governor</p> <p>Power</p> <p>Knock</p> <p>Compression</p> <p>Nursing</p>	<p>MISCELLANEOUS</p> <p>Wheels</p> <p>Springs</p> <p>Frame</p> <p>Rodius Rods</p> <p>Torque Arm</p> <p>Radiator</p> <p>Fan</p> <p>Fan Belt</p> <p>Battery</p> <p>Motor Controls</p> <p>Pedals</p> <p>Lever</p> <p>Windshield</p> <p>Lamps</p> <p>Speedometer</p> <p>Fenders</p> <p>Cab</p> <p>Body</p>
<p>BRAKES</p> <p>Foot Brake</p> <p>Hand Brakes</p>	<p>TIRES</p> <p>Left Front</p> <p>Right Front</p> <p>Left Rear</p> <p>Right Rear</p>
<p>STEERING GEAR</p> <p>Gear</p> <p>Tie Rod</p> <p>Front Axle</p>	<p>R repaired by</p>

Only the two principal forms (see page 18 and 19) are necessary in using this system. The first is the driver's Daily Report Card, on which is recorded the information as indicated. The reverse side of the Daily Report Card may be used to report any trouble in the operation of the truck. Daily Report Cards should be kept separately for each truck.

At the end of the month the information is transferred from the Daily Report Cards to the monthly sheet. The various items are recorded on this sheet under the heads of operation, maintenance, and fixed charges. The monthly sheet may also be used in making the yearly summary. The reverse side of the monthly (or yearly) form is used for estimating the unit cost of operation on any desirable basis.

		MONTHLY TRUCK	
		Month ending	1919
Make of truck		Ford Delivery Truck	
THE COMMERCIAL VEHICLE—TRUCK COST SYSTEM		Gasoline	Electric
Operating Charges			
Gasoline	100 gal.	@ 25 cents	\$ 25.00
Current	kw-h	@	
		@	
Oil	2 1/2 qt.	@ 40 cents	8.50
Grease	2 lb.	@ 25 cents	30
Kerosene	gal.	@	
Wash	lb.	@	
Dist. Water	gal.	@	
		@	
D. ves.	24 days	@ \$1.00 a month	1.00.00
Helper	days	@	
		@	
Mechanic	hrs.	@	
A—Total operating charges			134.00
			134.00
Maintenance Charges			
Tires	600 miles	@ 22 cents a mile	\$ 13.20
Repairs	at \$3.00 a year		3.83
Overhauling, Painting, etc.	\$135 every 2 years		5.62
Spare vehicle rental			12.50
Garage rental (see rate)			
B—Total maintenance charges			34.15
			168.15
Fixed Charges			
Insurance, fire	@ 10.00 per year		\$ 10.00
Liability	@ 12.50 per year		
Depreciation	@ 2.00 per year		
Interest	@ 6% (On loan 1-12)		2.97
Depreciation on chassis	@ %		
Depreciation on body	@ 2.00 %		1.67
Depreciation on equipment	@ 2.00 %		2.5
Depreciation on tires	@ %		
Tax and license			7.50
The difference between the purchase price and the trade-in value is \$130			10.83
C—Total fixed charges			33.64
			201.79

* Note: Omit one of these.

The cost of the Ford operation as obtained from figures furnished by a department store. Note the total cost of \$201.79 per month and how a charge of \$10.83 is made to prorate the \$130 paid each year when the Ford is turned in for a new chassis.

OVERHEAD EXPENSES.

For the individual truck-owner the overhead expenses may be slight. For the co-operatively-owned truck or a trucking business this charge should not be

neglected in figuring the rates to be charged. They may vary greatly of course, but should include supervision, office rent and staff, idle truck time, non-capacity loads, maintenance of warehouse, advertising, cost of soliciting business, and similar items. These expenses should be recorded separately from the operating costs in order that the operating efficiency of the vehicle may be determined and

COST SUMMARY	
Number of truck	<i>Model T (passenger car chassis) with delivery body.</i>
Capacity in lbs	<i>750</i>
Chassis No.	
<small>THE COMMERCIAL VEHICLE—TRUCK COST SYSTEM</small>	
Investment	
Cost of chassis, less tires	\$ <i>4.00</i>
Cost of body	<i>1.00</i>
Cost of equipment	<i>15</i>
Cost of tires	<i>80</i>
1—Total cost, complete	\$ <i>595</i>
Performance Record	
2—Days operated	<i>24</i>
3—Days idle	<i>4</i>
4—Days maintained (Item 2 + Item 3)	<i>28</i>
5—Total hours operated	<i>240</i>
6—Total miles covered	<i>600</i>
7—Total trips made	<i>72</i>
8—Total tons or packages or stops <i>@ 150 a day</i>	<i>3600</i>
Performance Averages	
9—Average miles per day maintained (Item 6 ÷ Item 4)	<i>21.4</i>
10—Average miles per day operated (Item 6 ÷ Item 2)	<i>25</i>
11—Average miles per trip (Item 6 ÷ Item 7)	<i>8.33</i>
12—Average tons, stops or packages per trip (Item 8 ÷ Item 7)	<i>50</i>
13—Average commercial ton-miles, package-miles or stop-miles per trip (Item 11 x Item 12)	<i>416.5</i>
Recapitulation	
14—Total expenses for month (Sum of Items A, B and C)	\$ <i>204.79</i>
15—Cost per day operated (Item 14 ÷ Item 2)	<i>8.41</i>
16—Cost per day maintained (Item 14 ÷ Item 4)	<i>7.21</i>
17—Cost per mile operated (Item 14 ÷ Item 6)	<i>34</i>
18—Total commercial ton-miles, package-miles or stop-miles (Item 7 x Item 13)	<i>29,958</i>
19—Cost per commercial ton-mile, package-mile or stop-mile (Item 14 ÷ Item 18)	\$ <i>.007</i>

compared with other records. Overhead expenses may then be added to the operating costs.

TON-MILE COSTS AND THE MAKING OF RATES.

For comparison of costs in different methods of transport and the making of rates, the ton-mile is used as a basis. A ton-mile is defined as the carrying of one

ton a distance of one mile. The actual ton-miles on a trip is figured by multiplying the distance by the number of tons carried. In actual practice with the motor truck, with its many stops and discharging and taking on a portion of the load, the determination of the actual ton-mileage is impossible, and what is known as the commercial ton-mile is used. This latter is figured on the total tons carried per trip, multiplied by the distance of the trip and divided by two. Commercial ton-mileage cannot be figured by multiplying the tonnage carried per day, month, or year, by the mileage per day, month, or year. The ton-mileage per day is the addition of the ton-mileage of the trips covered in that day.

Examples:

- (1) Actual ton-mileage—5-ton load carried 5 miles, returning empty.
(5 tons x 5 miles) plus (0 tons x 5 miles)=25 ton-miles.
- (2) 5-ton load carried 5 miles, returning with 5 tons.
(5 tons x 5 miles) plus (5 tons x 5 miles)=50 ton-miles.
- (3) Truck starts on a round trip of 22 miles loaded with 5 tons. After 2 miles it delivers 1 ton; travels 3 miles further and delivers 2½ tons; 4 miles further and delivers ¼ ton; 2 miles further and delivers 1 ton, when the truck is empty. The truck is then loaded with 5 tons and returns 11 miles.

Miles.	Tons.	Ton-miles.
2	5	10
3	4	12
4	1½	6
2	1	2
11	5	55
22	Total	85 ton-miles.

Commercial Ton-mileage:—

- (1) 5-ton load carried 5 miles, returning empty.
 $\frac{5 \text{ tons} \times 10 \text{ miles}}{2} = 25 \text{ commercial ton-miles.}$
- (2) 5-ton load carried 5 miles, returning full.
 $\frac{10 \text{ ton} \times 10 \text{ miles}}{2} = 50 \text{ commercial ton-miles.}$
- (5) Same as above.
 $\frac{10 \text{ tons} \times 22 \text{ miles}}{2} = 110 \text{ commercial ton-miles.}$

The operating cost per commercial ton-mile is determined by dividing the total operating expenses (not including overhead) by the number of commercial ton-miles. In determining the rates to be charged for truck service this cost per ton-mile should be used as the basis. Overhead charges and a fair profit should be added. It is difficult, however, to establish exact rates on the above cost-plus-profit basis, as some commodities will bear a much higher rate than others, due to their intrinsic value compared with their weight, or to perishability, or other reasons. The rates will also be influenced to some extent by the competitive means of transport, condition of roads, and other factors. Satisfactory rates are those which are low enough to attract business and high enough to offer a reasonable profit above the normal ton-mile cost.

In Ontario few highway transport firms have placed their rates upon a satisfactory basis. Neither the Federal nor the Provincial Governments have undertaken to standardize motor transportation rates. No doubt the time is not far distant when motor truck rates, like railroad rates, will come under public supervision. In this connection it should be remembered that while the railroad and

steamboat costs as a rule are reckoned only from terminal to terminal, the truck delivery is usually direct from consignor to consignee. Therefore, when a comparison of railway and truck costs is made, terminal charges, carting, extra cost of crating not needed for shipment by truck, and freight cost of extra weight of crates, should be reckoned in the cost of railway transportation.

In the United States, the Nebraska State Railway Commission established standard rates for motor truck haulage on July 1st, 1919. In fixing these rates the following estimate of operating costs, based on a truck with a 4,000 lb. load, driven fifty miles daily was used by the Commission:

<i>Operating:</i>	<i>Per ton-mile—Cents</i>
Gas (at 25 cents per gal) and oil (at 75 cents per quart).....	2.500
Chauffeur's wages (\$24 weekly with \$2 daily expense allowance).....	7.200
 <i>Maintenance:</i>	
Running repairs	2.500
Depreciation (on basis of 3,600 miles)	4.160
Repair of tires, etc. (life of 7,500 miles)	1.870
 <i>General:</i>	
Salaries, rent, etc.	3.000
Insurance500
Loss and damage800
Taxes (\$1,200 per ton for first year of truck's life, \$800 per second year, and \$400 per third year)027
Return on investment (2 per cent.)	2.500
 Total	 25.057

Allowing for profits, different sizes of trucks and other conditions on the above basis, it was estimated that 100 lbs. could be transported one mile for 1.5 cents. To this amount is added 15c per 100 lbs. to cover handling charges at point of origin and destination. Thus the rate for 100 lbs. of first class goods carried one mile is 16½c, and for 100 miles \$1.65. Second class rates are 85 per cent. of first class rates; third class are 70 per cent. and fourth class rates are 60 per cent. The minimum charge is 50c. The rates cover a schedule within a radius of sixty miles.

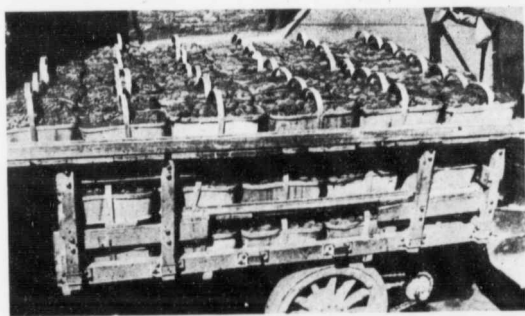
These rates were based on the erroneous assumption that the ton-mileage of motor transportation should be determined by multiplying the mileage covered during any period by the tonnage hauled during the same period.

THE RETURN LOAD BUREAU.

When a truck on a return trip travels empty or without full load, the cost per ton-mile is obviously increased. It is too expensive to move many empty trucks even over the Toronto-Hamilton highway. Every year there are thousands of dollars lost in the chief motor truck areas of the Province, because trucks are travelling empty and there is as yet no agency whereby idle or underloaded trucks may be given any business available. No doubt such an agency, called a Return Load Bureau, will in some form shortly come into being in Ontario. These bureaus are a recent development in the United States. They are either associations of truck-owners, who through such an association, divide their business or obtain new business for idle trucks; or they may be separate companies, catering to shippers for their trucking business, and engaging trucks of the different truck owners for the work.

THE CONDITION OF ROADS.

No figures are available to show the actual cost of operating trucks over different types of road. The economy of good traction roads, however, is so obvious that actual figures are perhaps not necessary. Return loads, efficient drivers, use of trailers and other methods of reducing cost are of no avail without good roads. As far as the motor truck is concerned the starting point on a good road programme is the highway bridges. Bridges are usually the weakest link. Though the Toronto-Hamilton highway was opened for traffic in 1917, the bridges were not completed till 1920. Traffic during this time was compelled to pass over weak temporary bridges, and 5-ton trucks could haul only three tons with safety. To provide for the risks on these bridges or in meeting disaster on inferior roads, transport concerns added a special rate. All over the Province motor truck loads and speeds are reduced by poor highways and bridges.



A truck from Coburg taking back peaches and grapes from the Toronto Fruit Market.

THE TRAILER.

A trailer attached either to a pleasure car or truck will be found to be economical under certain conditions. When attached to a pleasure car the trailer and its load should be comparatively light; otherwise the depreciation on the pleasure car is excessive.

The use of trailers will enable those engaged in motor truck express to increase their loading capacity at a comparatively small additional expense; providing there are no steep grades on the route. The pavement of a road is more likely to bear a truck and trailer than a truck of their total capacity. This is because the load is spread over a greater area and the trailer exerts no tractive effort on the road.

THE HORSE, THE MOTOR TRUCK AND THE RAILWAY.

Motor truck rates in Ontario have not been sufficiently standardized to afford a comparison between cost of railroad and motor freight, but at present much freight business has been taken from the railroads between such points as Toronto, Hamilton, St. Catharines, Welland, Guelph, Preston, Hespeler, Waterloo, Kitchener, Woodstock and London. In place of freight taking from four to ten days, there is now a daily truck service between these chief centres.

The motor cannot hope to compete with the railway in long hauls or even in fairly short hauls where the freight consists of bulky farm produce of low intrinsic value. Even when teaming charges at both ends of the haul, cost of crating the freight, and extra cost of freight on crates, are added to the railway freight rate for comparative purposes, the limit of advantage of a truck as far as cost is concerned is reached (under normal conditions) within 100 miles. It has been estimated that motor truck hauling under country road conditions costs from 12c to 25c or more per ton-mile. Railroad hauling costs $\frac{1}{2}$ c to 5c or more per ton-mile. Horse and wagon hauling costs from 20c to 40c per ton-mile. These figures would indicate that for continuous hauling (except for very short distances over a poor road) the motor is more economical than the horse; that the motor has the advantage of the railroad considering quickness of dispatch and less terminal expenses only up to a certain distance; and that for long hauls and bulky freight the railroad will be the permanent freight carrier. Within its field, however, the motor truck is an increasingly important factor in relieving the railroads of peak loads and in moving farm products short distances to markets.

CONCLUSION.

In summing up the information gained in this inquiry, the authors realize the absolute necessity of conducting a careful survey by any operator or group of farmers desiring to start a motor route in any particular locality. Inquiries should therefore be made in the following directions:

- (1) The county agricultural representative, with his intimate knowledge of local conditions, should be able to give an unbiased opinion.
- (2) The local banker, in close touch with conditions in his district is a helpful source of information.
- (3) The local merchants know the transportation needs of their communities. These merchants, together with local industrial plants, and city dealers with rural clientele, make profitable customers, as their freight usually bears a higher rate than farm products. Few farming districts can support a motor route with tonnage of farm products only. The amount of commodity freight available between towns and villages and cities should be estimated.
- (4) The farmer shippers should be interviewed in order to estimate the amount of tonnage moving from the district, and available for a truck.

The conditions to be inquired into include:

- (1) The times of shipment of the tonnage available. The ideal territory is one in which the products move to market in a fairly steady stream throughout the year, such as in a dairy or truck farming district.

(2) The character of the tonnage. Low priced, light or bulky staples (such as hay) will not usually bear the motor truck rate. In general, loads which have a high value per unit of weight or size offer the most profitable return.

(3) The possibility of obtaining return loads.

(4) The roads. In connection with roads it is necessary to know what territories they serve and where they connect; whether paved, the kind of pavement, and its condition in wet and dry weather; the grades; the traffic conditions at different hours on different days of the week and at different seasons of the year. (Much freight is moved over the Toronto-Hamilton highway at night to avoid congestion of traffic during the day.)

(5) The existing transportation facilities. The prospective operator should pay special attention to the schedules, collection and delivery arrangements, and rates, of existing carriers, and determine whether the motor can make marketing more direct, can move perishable products more speedily, or can offer a more complete pick-up and delivery service at competitive rates.

Since rural motor express is developing rapidly, failures should be avoided by acquiring an accurate knowledge of conditions and using good judgment in forecasting business prospects.

It has often been maintained that the average farm is already over capitalized with machinery. The purchase of trucks by individual general farmers would accentuate this condition, as the truck like other machinery would be used but a small portion of the year. The co-operative ownership of a truck, by which the trucking of a number of farms may be combined, would therefore be more advantageous, and might prove to be the means of overcoming the transportation difficulties of the district.