

CHAPTER IV

THE ORGANIZATION OF ROAD TRANSPORT

So far in dealing with the subject of movement we have been considering "Transportation" rather than "Transport." Transport is the general name given to the various agencies used for moving the army's needs from place to place, while transportation is the system, or science, of utilizing the various types of transport to effect movement on land, on water, or in the air. In this chapter the principles and system of organization of road transport will be examined.

Our normal organization for war includes both wheeled and pack transport, the wheeled vehicles being either horse-drawn or mechanically propelled. But in the various theatres of war in which British troops have been engaged in the past, and may be again, there are many different types of transport to be considered. These types may vary between the Chinese wheelbarrow, the reindeer or dog sledge of Russia, the ropeway of the Italian mountains, the carrier of the African bush, the yak of the Himalaya, the pack mule, donkey, camel, ox, or elephant of other countries. Again, special conditions may call for special improvisation, as in the case of the mud of a devastated area in Flanders, which produced the primitive but efficient means of transport—a bent piece of corrugated iron pulled by a horse.

Experience has proved that the vehicles in general use by the inhabitants in any given district for the ordinary avocations of peace are in many ways eminently suitable for employment during military operations in that district. Consequently, when transport has to be improvised, the vehicles of the country should always be used to the fullest possible extent for military operations in that country.

Principles involved in Transport Organization.

In planning any road transport organization, there are three main principles which need to be kept in mind ; they are :—

- (a) The organization must aim at keeping transport as fluid as possible.
- (b) The organization must be elastic.
- (c) The organization must be adaptable to meet any needs of the moment.

To consider these principles in greater detail :—

Keeping transport fluid means pooling resources to the greatest extent possible. Every unit must, of course, be provided with sufficient transport for its own immediate needs, but this allotment must be kept to the absolute minimum. All other road transport vehicles should be on the establishment of organized transport units which can be used for general purposes. The nearer the front line, the less fluid transport becomes, but farther back towards railhead the possibilities of pooling increase and should be adopted to the fullest extent possible in the interests of the force as a whole.

Elasticity of our transport organization means capability of expansion or contraction in accordance with fluctuating strengths, and varying demands on its carrying capacity, and of covering varying distances.

It may at times be necessary to introduce an extra echelon to avoid cramping the mobility of a particular force ; conversely one or more of the normal echelons may sometimes be dispensed with and the transport thus released be made available temporarily for other services. Too rigid a transport organization tends to reduce the freedom of action of a force. Our present organization admits of echelons being readily detached in conformity with any detachment of the fighting units which they are normally designed to serve.

Adaptability of our organization is necessary to meet changing circumstances and the necessity for improvisation. Although a force may begin a campaign with what is considered to be the best form of transport for the particular theatre of operations, it is difficult to foresee all and every circumstance which may arise necessitating the alteration of vehicles, loads, and methods. Such difficulties may come from soil, climate, or many other causes, of which the necessity of using pack transport in France and Flanders, and the changes from river to sleigh transport in North Russia are instances.

In conformity with the above principles our transport is organized in three echelons—first, second, and third line.

First line, or unit transport, consists of those animals and vehicles which form an integral part of the war establishment of the unit, and which are allotted to it for the carriage of the ammunition, stores, and supplies which it requires for its daily needs and for the performance of its normal duties in action.

Second line transport is represented by the baggage, supply and ammunition companies of the divisional, cavalry divisional and corps or army troops, R.A.S.C., which are allotted for the carriage of baggage and great-coats and for the daily delivery to units of the rations, forage, ammunition, ordnance and engineer stores, petrol and mails which they require for their maintenance from day to day.

Third line transport is represented by the Maintenance Companies R.A.S.C., which are provided on a basis of one for each division and cavalry division, and for corps and army troops in accordance with requirements, for the carriage of supplies, mails, stores and ammunition.

The detailed organization and functions of these three echelons of transport will now be further examined.

First Line Transport.

The points to bear in mind in connection with unit first line transport are that each vehicle has its allotted load and there is no reserve carrying capacity; consequently if additional loads are imposed upon it, something else has got to be discarded or temporarily impeded. The vehicles and animals included in unit transport are partly provided for the carriage of essential fighting needs, such as Lewis and Vickers guns and ammunition, and partly for the more creature comforts of the soldier, such as travelling kitchens and water carts. Although unit transport is normally driven by personnel belonging to the unit, and usually accompanies the unit, it can, when occasion demands, be subdivided into two; the fighting necessities remaining with the unit, the remainder being temporarily grouped under another command and moving separately in accordance with the tactical requirements of the moment. We find this practice exemplified in the custom of brigading "B" echelon of unit first line transport of infantry and cavalry brigades during tactical operations.

Second Line Transport.

The detailed organization and functions of second line transport are best exemplified by considering the organization within a division; the case of a cavalry division is exactly similar, and corresponding provision now made in the case of non-divisional troops. The A.S.C. organization of a division will in future consist of a headquarters and three units—viz., a *Baggage Company*, a *Supply Company*, an *Ammunition Company*. The normal equipment of these units, with the exception of the Reserve Transport Company, is the light (30 cwt.) pneumatic tyred lorry.

The Baggage Company is provided for the carriage of the authorized scale of baggage for all units of the division, and of greatcoats for infantry battalions and

field Companies R.E. It is divided into four sections, one corresponding to each infantry brigade, and one for divisional troops.

The Supply Company, which is also organized in four sections, is provided for the carriage of approximately 180 tons of supplies and forage, 12 tons of ordnance stores, and 6 tons of engineer stores, which together constitute the normal daily requirements of a division. (Total lift, 148 tons.) The normal function of the supply company is to carry supplies from Refilling Points, where they are delivered by the third line transport, to delivery points—that is, to unit first line transport. In future a separate petrol section will probably be added to the supply company.

The Ammunition Company carries approximately 147 tons of ammunition. It is divided into two sections, one for S.A.A. and grenades, the other for artillery ammunition; this latter section is again subdivided into sub-sections for 18-pounder, 4.5-inch howitzer and 3.7-inch howitzer ammunition.

The normal function of the ammunition company is to carry S.A.A. and grenades between ammunition refilling point and infantry brigade S.A.A. reserves, and artillery ammunition to the D.A.C. or battery wagons.

The Repair Company, which formerly was a separate unit, is now abolished as such, and each M.T. Company includes in its organization facilities for effecting second line repairs. Second line repairs are those which can normally be completed within four days with the light power tools at the disposal of the mobile workshop lorries.

As regards non-divisional units, such as tanks or medium artillery, these units may be attached from time to time to different corps or divisions, and, as they move from one formation to another, they will be accompanied by their corresponding echelons of second and third line transport, for the carriage of their baggage, and the maintenance of their supply services. The

Second line transport for these units is shown in the establishments of the units themselves, but it joins corps troops baggage and supply companies of the units with which the unit is serving for the time being, in the event of the unit being attached to a division, its second line transport would be attached to the baggage and supply companies of that division, while its corresponding third line echelon would be attached to the corresponding maintenance company in the corps transport column.

For the second line requirements of corps troops units in the matter of ammunition supply there is a corps troops ammunition company R.A.S.C., equipped with 30-cwt. lorries. This unit consists of sections for an army field brigade, medium brigade, or tank battalion for the time being allotted to the corps. This ammunition company performs identical services to the non-divisional units to those performed by the ammunition companies R.A.S.C. of divisions for the units included in the division. A small exception to this system is made in the case of A.A. batteries. In their case, owing to the probably large areas over which they may be distributed tactically, no ammunition lorries are included in the corps troops ammunition company R.A.S.C., but two light lorries per gun are provided on battery establishments for the maintenance of ammunition supply from A.R.P. forward.

Third Line Transport.

Third line transport is normally equipped with heavy T. vehicles, at the present time the 3-ton lorry. It is organized in maintenance companies, which each have two sections, one for supplies and one for ammunition. The function of the maintenance companies is to work between the respective railheads and the supply and ammunition refilling points, where they transfer their loads to the second line transport. The tail of the system is considered in a later Chapter under the heading of Maintenance.

The maintenance companies serving the various divisions are grouped together to form the Corps Transport Column under the A.D.S. & T. of the corps, who accordingly has at his disposal the following units :

Third Line—

- (a) A maintenance company for each division in the corps for the carriage of supplies, mails, ordnance stores and ammunition.
- (b) A corps troops maintenance company to perform the same functions for all non-divisional units in the corps.
- (c) A reserve M.T. company for emergency and general transport purposes, with a carrying capacity of approximately 250 tons.
- (d) A vehicle reception park to facilitate the rapid replacement of breakdowns.

Second Line—

- (e) A corps troops ammunition company.
- (f) The second-line transport of non-divisional units, formed into a supply and a baggage Company.

(NOTE.—A corps troops M.T. Repair Company, for second-line R.A.S.C. repairs, was formerly included as a unit of the Corps Transport Column ; it has now been done away with as a separate unit, and each M.T. company is equipped with mobile repair facilities within its own establishment.)

The road transport organization outlined above has been evolved as the result of experience gained in the Great War, and was largely brought about by the tactical conditions arising out of the Passchendaele fighting of 1917. During this battle the tremendous development of the enemy's artillery fire, directed in large part on our light railway system, made it impossible for these railways to compete with the task of maintaining the supply of the masses of ammunition, engineer stores, and supplies of all kinds, that the nature of the operations demanded. In consequence it was upon the roads

and our mechanical transport that the bulk of the maintenance work then fell.

The strain thus imposed on our mechanical transport soon showed that our existing policy for M.T. organization, under which vehicles and units were specialized for particular services, was not the best one. Early in 1918 a new policy was adopted under which M.T. vehicles were organized into companies for use, under a central authority, in accordance with the requirements of the situation. Many of our former specialized M.T. units, such as ammunition sub-parks, ceased to exist as such, the "pooling" principle was adopted and a central reserve of M.T. companies was formed.

The German offensive of March, 1918, which closely followed our road transport reorganization, showed clearly the advantages inherent in the new system. This offensive was directed against certain vital railway centres behind the allied front, and the overrunning of such important lateral railway lines as Amiens—Achiet—Arras and the interruption by shell-fire of the line Hazebrouck—St. Pol—Amiens—St. Just interfered very seriously with efficient railway working. Owing to the difficulties of finding return circuits for empty rolling stock, congestion and delays occurred on the main forward lines, and we were compelled to select railheads far back. At the same time heavy additional demands were made on the railways for stores for the construction of rear lines of defence, for the evacuation of casualties and material of all kinds from areas threatened by the enemy; demands were also made on the British lines for maintenance of French, American, and Portuguese troops, and also for feeding civilians. In these circumstances the railways became hopelessly overweighted and congested, and the maintenance of the fighting troops was seriously endangered. The situation was met by the reserve M.T. companies, which had been formed on the reorganization. The work performed at this time by the M.T. companies, and until the Arras—Amiens railway line was regained by our advance in

July, 1918, is a splendid record in the annals of the Royal Army Service Corps.

At this time the maintenance of the armies was carried out by long-distance road work performed entirely by mechanical transport, and it would have been impossible, but for the reorganization which had been effected and which had provided the necessary reserve in the hands of the Q.M.G. Not only had the new organization proved its value, but unmistakeable proof had also been afforded of the necessity for centralized control of all transportation services under the Q.M.G.

Enough has been said to show that the lessons to be learnt in the organization and employment of mechanical transport, and in the science of transportation generally, are among the most important of the whole war. It is the clear duty of the soldier to study these lessons, to consider their application to possible future theatres of operations, and to note particularly their bearing on strategy and tactics.

Before leaving the subject of the organization of road transport, it would be well to consider some points arising from its radius of action and speed of movement, as these questions closely affect the whole problem of maintenance, which is to be considered in the next chapter.

On good roads, and during daylight, the solid-tyred 3-ton lorries can maintain an average running speed of 10 m.p.h. when working in convoys ; while the 30-cwt. lorries on pneumatic tyres can average 15 to 18 m.p.h. When working at night, in bad weather, or on indifferent roads, these figures must be considerably reduced ; with large convoys under service conditions not more than half the above speeds should be counted on at night.

Under war conditions and allowing time for loading and unloading, cleaning, fuelling, and oiling vehicles, and for reasonable rest for the drivers, it has been found uneconomical to run lorries much more than an average of fifty miles a day. This figure can, of course, be

exceeded when necessary, and the practical working limit is in or about ninety miles a day for heavy lorries and 130 miles for light lorries on good roads. It must, however, be realized that long journeys cannot be combined with effective concealment from air observation. The military situation will, in consequence, usually be the determining factor in deciding on the maximum distance which can be covered.

The use of two M.T. echelons admits of deliveries of goods being maintained up to fifty miles from railheads without undue strain. This should not, however, be taken as normal, and, generally speaking, delivery points should be considerably less than fifty miles from railhead, if reasonable concealment from air observation is to be obtained. From a consideration of the above points a figure can be arrived at for the distance between railheads and the gun line, or the infantry unit, both for economical working and as a practical maximum, as follows :—

		Economic radius	Maximum radius
3rd Line M.T. Coys.	...	25 miles	45 miles
2nd Line M.T. Coys.	...	25 miles	65 miles
1st Line H.T.	...	6 miles	10 miles
Totals	<u>56 miles</u>	<u>120 miles</u>

With the present day developments in mechanization we can anticipate that first line transport of the future will consist of mechanically propelled vehicles, whether light six-wheelers, tracked or semi-tracked. This will give a slightly increased radius of action over horse-drawn vehicles, but not a very great increase, as the factors of lateral distribution and cross-country work must be allowed for. It is on account of these considerations that no allowance has been included in the above figures for the existence, in the case of artillery ammunition supply, of two horse-drawn echelons, the battery wagons and D.A.C. of our existing organization. In mobile operations it is unwise to count on this extra echelon being used other than for lateral distribution

purposes ; it is not an additional link in the chain of supply from railhead to gun. The battery wagons in continually attending on the guns will soon cover their own maximum daily mileage ; they will often have to be used in common with the D.A.C. horse-drawn wagons for carrying ammunition from lorry head (delivery point) to the gun line. Until such time as both are replaced in our army by cross-country M.T. vehicles, our radius of action in advance of railhead will remain as indicated above.

Developments in road transport work with an army in the field bring with them a number of correlated factors for consideration.

The increase in the use of mechanical transport, both for tactical purposes as well as for the work of maintenance, makes an army far more dependent on roads than was formerly the case. Cross-country mechanical traction is, of course, developing along various lines, but roads and road transport still play a very prominent part in the carriage of an army's needs. The increase of mechanical transport necessitates a greater measure of staff control over transport than was the case in the past. The wear and tear on roads are very heavy, and the most careful organization of repair work and of traffic control is essential. The maintenance of roads requires much labour, plant and material. A few *skilled* men can possibly keep a road in repair if provided with the necessary material, where unskilled men would do more harm than good. But once a road has got into a bad state of repair, quantities of unskilled labour, under skilled directions, will be necessary to put it in order again.

The staff can do much to prevent unnecessary wear and tear of roads, by careful organization of traffic circuits, by arranging separate routes for horse transport and mechanical transport, by ensuring supervision and control to prevent M.T. vehicles proceeding along roads at excessive speeds, by sighting horse lines and water points where animals and vehicles using them will not

bring mud on to the roads, and by making provision during periods of hard frosts so that heavy transport may be kept off the roads during the subsequent thaw.

It is in such matters, and in the prevention of waste of transport by reduction of empty mileage, that a good staff organization will add immensely to efficiency. Staff work in connection with transport tends to become more important owing to air developments. An increase of mechanical transport in an area is a sure sign of an increase of fighting troops in this region. Quantities of M.T. vehicles are readily visible to air observers, and the necessity of confining movement of M.T. columns to the hours of darkness is becoming more important, and obviously movement of this nature will necessitate very careful and detailed staff work.

Yet another important consideration is the provision of parking grounds with hard standings for the large masses of M.T. vehicles now included in our army. This has to be borne in mind in all questions of accommodation of troops and control of M.T. units. Cover from air observation, prevention of traffic congestion, and avoidance of empty mileage must all be considered in this connection.

APPENDIX 4.

TABLE TO SHOW THE COMPARATIVE USEFUL LOAD OF DIFFERENT TYPES OF TRANSPORT AGENCIES.

NOTE.—The actual load of any transport vehicle varies enormously with the composition of the load, *e.g.* :—A 10-ton railway truck will carry 10 tons of oats, but only 4 tons of bread or 7 tons of meat. A man can carry 500 rounds of S.A.A. weighing 40 lbs., but only one box of grenades weighing 28 lbs.

In the following table the maximum dead weight loads are given.

Serial No.	Type of Transport	Maximum useful Load	Relative Mobility		Daily maintenance food, forage or petrol
			Rate M.P.H.	Days' March	
1	Native carrier	40-50 lbs.	2½	12-15	4½ lbs.
2	Pack donkey	100 lbs.	1½-2½	12	14 lbs. excluding driver.
3	Pack mule or pony ...	160 lbs.	3	12-15	18 lbs. do.
4	Pack horse ...	200 lbs.	3	12-15	24 lbs. do.
5	Pack bullock ...	200 lbs.	2	12-15	20 lbs. do.
6	Pack camel ...	320 lbs.	2	12-15	22 lbs. do.
7	L.G.S. wagon	15-30 cwt.	2½	15	48 lbs. do.
8	Light van ...	8 or 15 cwt.	15-25	60-90	2½-3½ galls. (18-27 lbs.)*
9	30 cwt. lorry	30 cwt.	15-25	60-90	3-4½ galls.†
10	3-ton lorry ...	3 tons	10-20	50-90	22-33 lbs.‡ 5-9 galls. 36-65 lbs.)*
11	Dragon as carrier ...	3 tons	10	45	—
12	Burford semi-track ...	30 cwt	20	60-90	—
13	Crossley semi-track ...	30 cwt	20	60-90	—
14	Morris 6-wheel	15 cwt	30	60-90	—
15	Hathi tractor (hauled) ...	10 tons	15-20	50-90	—
16	Transporter tank ...	3 tons	12	45	—
	<i>Aircraft</i>			Radius of action.	
17	Bristol Fighter	224 lbs	105 @ 10,000 ft.	100	26 galls.‡
18	D.H.9 ...	448 lbs.	114 @ 10,000 ft.	200	36 galls.‡
19	Heavy bomber	2,200 lbs.†	95 @ 8,000 ft.	450	80 galls.‡
20	Troop carrier	2,200 lbs.†	95 @ 5,000 ft.	120	80 galls.‡

* Weight of petrol is for bulk supply—i.e., exclusive of weight of tins.

† Dependent upon amount of fuel carried.

‡ Average over a month.