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# The Role of Transport and Traffic in National Economy

by Dr Horst Heldmann, Bonn \*

**This article deals with transport as a service and as an investment sector. It shows the special role of transport in national economy and draws attention to some problems, which are characteristic and of particular importance to LDCs.**

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The importance of any industrial branch for a national economy is generally measured by means of indices which act as indicators reflecting its economic situation. The most frequently used indices are

- ☐ the number of persons employed in the economic branch,
- ☐ its turn-over figures,
- ☐ its contribution to the national product.

There are further indicators whose employment, however, largely depends on the object of study.

This applies likewise to the field of transport and traffic. The number of people employed in the transport sector as well as the turnover figures of passenger and goods transport can be derived from relevant statistics. In the western industrialised countries the contribution of transport to the gross national product lies on an average between 6 p.c. and 8 p.c.

However, all these data give only an incomplete picture of the importance of a transport system or an individual mode of transport to the total national economy. Recent scientific studies have shown that a transport system can have a substantial effect on the economic development of a geographic area. The nature and quality of a transport system are likely to generate processes of economic growth, but can just as well hamper or change already existing impulses. From the economic point of view it must also be considered that apart from its service functions transport also attracts substantial investments and is consequently a considerably important factor for the general economic development of a country.

Therefore, the following explanations are subdivided into 3 sections, namely transport as a service, transport policy and regional planning, and trans-

port as an investment sector. In doing so, there shall be shown on the one hand the special role of transport in national economy, but on the other hand also the manifold problems which result from structural changes and mis-developments. Concluding these explanations, attention shall be drawn to some problems which are characteristic and of special importance to developing countries.

## **Transport as a Service**

Transport is a universal service to the economy and community. It is intimately related to all other economic and non-economic sectors. Economically speaking, transport — like money — fulfills an elementary function in any economic system which is based on the division of labour.

The function of transport can be put into the following concise formula: covering of distances in the service of goods supply by transferring goods, passengers and messages from one place to another. Transport, therefore, carries goods to the place where they are urgently wanted and thus helps to overcome local shortages, thus increasing the value of the goods concerned. Transport fulfills this function not only on the domestic level as inland transport, but also on international level, as international or intercontinental transport.

The economic importance of transport as a branch of the services trade lies in the fact that, in fulfilling its transport functions, it promotes greater differentiation and integration of economic systems as well as equal distribution of production and consumption. At the same time transport increases the possibilities of competition which in turn aim at balanced prices, price stability and the prevention of monopoly prices.

Geographically separated areas are brought closer together through the services of transport. Areas which are thus brought closer within the

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reach of the market, eventually enjoy more intensive economic activity.

On the one hand, the transport system as a whole is a necessary and indispensable element for the functioning of any differentiated economy. On the other hand, the existence of different transport branches within a transport economy requires an economically consistent division of labour within the transport sector. In domestic transport, and to a certain extent this applies also to a whole continent, various modes of transport, such as railways, inland water transport, road transport, pipelines and, within certain limits, also air transport compete with each other, in intercontinental transport, however, the principal competitors are only maritime and air transport.

In addition to the great diversity within the various modes of transport which continue to differentiate and specialise in keeping with the increasing transport requirements, the individual branches of the transport economy have developed a range of enterprises of different sizes, reaching from the large-scale enterprise, such as the railways, down to the small enterprise of a road haulier owning one goods vehicle only, or the inland water transport enterprise operating only one barge. There are also great differences in respect of the organisation of the various transport enterprises; there are, for instance, big comprehensive transport enterprises like the railways with compound operation of goods and passenger transport; there are combined forwarding and transport enterprises, pure transport enterprises, and also manufacturers carrying their products on their own lorries or barges, what we generally define as own-account transport.

In the light of this multiplicity of forms and structures in the transport sector, cooperation and division of functions are elements of special importance.

### **Transport Policy and Regional Planning**

The problem of division of labour within the transport sector points towards another very important and for any appreciation of the economic value of transport very essential aspect: that of interrelationship and interdependence of transport policy and regional planning. Optimal economic cooperation between residential areas, industrial agglomerations, and the more remote and economically weaker border areas requires a well-balanced planning of transport infrastructure, in coordination with the general regional planning; that is to say both rural and urban planning. In the interest of good structural development of the regions concerned, it is desirable

that all transport planning should aim at a balanced distribution of the traffic flows as well as their repartition on those modes of transport which are best fitted to accommodate them.

These requirements clearly demonstrate that construction of transport infrastructure — in keeping with the given state of development in a country — is one of the most essential elements of optimal economic satisfaction of the diverse range of transport requirements. Acute and particularly difficult transport problems in the agglomerations cannot be solved, unless the immediate environment and the region as a whole are included in the planning. It is a fact that insufficient development of the transport system in rural areas very often results in an intensification of the rural exodus and, consequently to a still greater concentration within the agglomeration areas.

Any new industrial plants, residential areas, and similar projects must, therefore, be designed in such a way that they do not cause further congestion of the city traffic network. Even the most modern city transport network will, ultimately, reach a point where any further extension involves unproportionally high cost to the national economy and imposes virtually intolerable conditions to the public.

What are the conclusions that can be drawn for transport planning in developing countries in the light of what has been said so far? We shall now try to analyse the situation and its consequences: Let us consider a place which is a junction of several traffic relations and as such attracts new commercial enterprises or encourages the extension of existing enterprises. Modern location theory has established beyond doubt that such traffic junctions offer particularly good conditions for net investments.

Net investments have an income and capacity effect. According to the findings of modern growth theory the interaction of the multiplication and acceleration principles is likely to spark off self-sustaining development processes. What we want to know is, to what extent such a development process is formed and characterised by the transport system.

There is no doubt that the transport system has an influence on the direction of the income effect. Where working place and domicile of the working population lie close together due to insufficient commuter services, the income effect is concentrated on a very small punctiform area. If there are within a national territory several traffic junctions with good locational conditions, it is likely that economic development processes are generated in these points whereas the areas lying

between them remain unaffected. This is today the situation in many developing countries. But it is also illustrated by the economic history of Western Europe. If the income effect is to be spread over a larger geographic area, the transport relations and services in the economic hinterland of the development centres have to be improved, so that at least part of the income earned in the centres is spent in the more remote residential areas of the workers.

But also the capacity effect of an investment is influenced to a substantial extent by the quality of the transport system. With more traffic relations to the more remote markets, the industries located in the favoured areas are able to extend their market position and to proceed to mass production. In many cases this results in a reduction of the marginal costs so that, cost-wise, the industries are able to improve their market position. Economically speaking, the limit of further extension of the market position is theoretically reached if additional costs for transport exceed possible cost savings per unit of production. But since in most instances improved transport quality results in lower transport costs any extension of the transport system is likely to push this limit continuously further.

The interaction of income and capacity effect emanating from the transport system thus can give rise to growth processes which initially favour only specific points, later on however cover whole areas and eventually form industrial zones, as can be seen from the example of Western Europe and North America.

#### **Transport as an Investment Sector**

Another very essential economic aspect of transport relates to transport investments. It is quite natural that in highly industrialised countries with comprehensive and differentiated transport systems these investments assume much greater proportions than in developing countries. This may change in a relatively short time considering the present stage of technical development and the manifold possibilities it offers. There is no doubt that the developing countries will develop their transport systems and industries much more rapidly today than leading industrial nations were able to do during the last century. Hence, the developing countries should be interested in getting an idea of the proportions of investments involved, bearing in mind that the development of transport and the investments required for that purpose are to some extent interrelated.

As this sector of transport is mainly a matter of figures and orders of magnitude the explanations will be concentrated on the essentials. It should,

however, be pointed out at this juncture, that transport is one of the most capital-intensive branches of national economy. According to scientific calculations the capital invested in transport in the Federal Republic of Germany amounts to 50 p.c. of the total industrial investment. During a period of 20 years since the constitution of the Federal Republic of Germany from the year 1949 until 1969, public authorities and private transport economy together have invested some DM 180,000 mn in infrastructure, vehicles and other transport installations. To this, another DM 100,000 mn must be added, spent on 16 mn private cars, newly admitted to traffic during that same period.

In the Federal Republic of Germany, private and public transport investments represent 15 p.c. of the total economic investments. Transport investments of the Federal Government amount to 40 p.c. of all Federal investments. The transport budget has a share of 11 p.c. in the total Federal Budget. This shows that transport is one of the principal customers of the capital goods industry and consequently makes a considerable contribution to economic growth.

The emphasis of investments lies on the field of traffic infrastructure, including construction, maintenance and repair. In the Federal Republic of Germany the largest proportion of investments goes into road construction. Over the 20 years, from 1949 to 1969, the total gross-capital investment in road construction amounted to some DM 80,000 mn. To this we must add other capital expenditures, in particular for stationary installations such as ports, railway stations, transshipment equipment — and rolling stock.

To give an idea of the orders of magnitude involved, in the following there are returned some figures of gross capital investments in the Federal Republic of Germany during the 20 years, from 1949 to 1969:

	DM in mn
Railways, including tracks	40,000
Tramways and busses	11,000
Road transport of goods and passengers for hire and reward (including forwarding operators)	15,000
Waterways, inland water transport, inland ports and affiliated enterprises	10,000
Maritime ports and maritime transport	18,500
Air transport	5,500

Capital expenditures of this proportion for transport infrastructure require, of course, detailed studies to ensure that an optimal investment

structure is obtained. Possibilities in this field are given by transport research and by application of general economic cost-benefit-analyses in cases of appropriate importance.

### LDCs — Long-Term Solutions Preferable

But, as we know that any maximisation of productivity in underdeveloped areas is likely to result in a one-sided strengthening of the existing development centres, and a further discrimination of the "backward areas", the principle of equal distribution of marginal profits asks for long-term solutions. To illustrate this, there may be given an example from developing countries. With respect to the long-term integration of the whole African Continent, the problem of standardisation of the railway gauges is of some significance. In such an event, the economic areas of Kenya — Uganda — Tanzania, for instance, would be required to change 6,339 km of railway track from a 1 m gauge to the Cape-gauge, which is 3 feet 6 inches, or 1.067 m. The cost of such changes of gauge on existing networks is estimated at Dollars 28,000 per km. This amount could, however, be reduced to one-eleventh of its original sum, that is to say to Dollars 2,400 per km, if already now the necessary precaution were taken to facilitate subsequent changes of gauge, — by installing certain technical adapter devices whenever new tracks are built or old ones are repaired. Although this may cause a higher initial investment cost which, on a short-term basis, does not yield higher rentability or productivity, in the long-run, however, it will guarantee considerably higher rentability and productivity.

### Conclusions

After this brief introduction into the different aspects of transport and their effects on the economy, there shall be summarised the conclusions that can be drawn.

☐ The benefit of sufficient development of the transport system lies generally in the creation of efficient transport services, in the reduction of excessive and production-hampering transport costs on existing relations, and consequently in the possibility of greater mobilisation of a country's natural resources. Newly established or strengthened contacts with outside lying areas and societies may introduce new impulses into stagnating conventional economies, and if they are accompanied by political measures they can break up rigid demand structures and stimulate new demands; at the same time new and additional opportunities of profit-making might contribute to develop a new spirit of enterprise and also new initiatives.

☐ The extent to which the fruits of technical progress can be made use of for the purpose of cost reduction in fields other than transport is largely determined by the size of the area involved, which in turn is a function of the quality of the transport system, by the population of this area and its average level of demand. Mass production requires large markets, which depend on the efficiency of the transport system. The better the quality and efficiency of a transport system, the greater and more plentiful are the chances of economic growth. In developing countries the contribution of the transport system to the national income is, therefore, in the beginning of lesser relevance than the creation of a transport system which is efficient enough to provide economically relevant service so that it is able to spark powerful development impulses for the economy as a whole. The productive value of the transport system for the total economy of a developing country should, therefore, not be given priority in the considerations and plannings for transport, — at least not in the beginning.

☐ If a developing country were compelled to organise its transport system exclusively in accordance with the principles of market economy it would probably never be able to catch up. In such countries the extension and improvement of the transport system, at any cost, is a must and prerequisite for economic development.

☐ Immense progress in the field of technical development of the means of transport and communication has made our world become smaller and smaller. And this development is going to continue. Its component in the economic sector is the formation of larger economic communities aiming at large-scale economic integration. A necessary consequence is that the transport system must be fit for cooperation on continental and intercontinental level. This trend gets strong impulses from the benefit offered by the use of containers which allow the continuous transport chain from continent to continent to become a reality.

☐ The core of any discussion on the economic importance of transport is, naturally, goods transport which, no doubt, is the principal aspect of its economic function. Of no lesser importance, however, is the role of transport in passenger traffic where it spans bridges from continent to continent, from country to country, and from man to man. This function in the service of international understanding cannot be expressed in economic figures and quantities. In a future where all nations of this world live in peace, freedom, and friendship with each other this function of transport will be of great significance, and it is worthwhile remembering this at the end of this consideration.