

Immobility: Barrier to Development

WILFRED OWEN, The Brookings Institution

•IN the complex process of development, transport plays a special role in facilitating other objectives: getting land into production, marketing agricultural commodities, making forest and mineral wealth accessible, developing industry, expanding trade, conducting health and education programs, and exchanging ideas. In recent years there has been a sharp increase in the availability of improved transport and in the impact of transport on levels of living.

Conversely, in large areas of the world lack of transport is a primary obstacle to economic and social gains. Poor transport is a major factor in world hunger; produce rots on the ground because it cannot be moved to the people. Much of the world's forest and mineral resources lie untouched because no one can get to it or move it to where it is needed.

Industrial activity is severely hampered by unreliable transport, leading to erratic supply schedules for essential fuel, raw materials, and spare parts as well as difficulties in marketing what is made. Traffic often has to wait for months for rail shipment, even with advance space reservations.

And on the political side, poor transport makes it exceedingly difficult to achieve national unity.

The size of the financial commitment to transport suggests its importance: transport generally ranks first or second in magnitude among all expenditures for national development and has accounted for as much as one-third of all loans by the International Bank for Reconstruction and Development.

How, then, does transport influence development? How can obstacles imposed by poor transport be reduced to further economic, social, and cultural ends? How does a country determine how much transport it needs when measured against other requirements? What kinds of transport would be best, how should they be financed, how administered? What role can foreign assistance play? In short, what must be done to achieve as quickly as possible the minimum standards of transport needed for rising levels of living in low-income countries?

THE SIZE OF THE PROBLEM

Today, in a few spots, there are dramatic examples of what transport modernization can do, particularly for the major cities of the developing nations. But despite these improvements, the gap between rich and poor countries and the distance still to be traveled by the underdeveloped nations are enormous. For example, if Latin America, Africa, and Asia (excluding the USSR) were to have just half as many miles of surfaced roads per square mile as the European Economic Community, 20 million miles of good roads would have to be built. Today, this huge area has scarcely one million miles of roads, mostly poor. For a similar upgrading in motor transport, the number of trucks would have to jump from less than 5 million to 26 million.

A variety of both natural and man-made obstacles will have to be overcome to narrow the transport gap between the immobile and the mobile nations. Poor countries generally have to cope with a formidable combination of physical obstacles—mountains, excessive heat, vast deserts, unpredictable rivers, and too much or too little rain. In addition, during colonial periods, transport was often developed primarily for military or export purposes, with little regard for internal growth requirements. Instead, the growth—and congestion—occurred in the port cities.

TABLE 1
WORLD TRANSPORT TRENDS BY CONTINENT, 1950-60
(Freight in billions of ton-kms; all others in millions.)

Continent	Total Increase				Percent Increase			
	Rail Freight	Motor Vehicles ^a	Buses & Trucks ^a	Population	Rail Freight	Motor Vehicles ^a	Buses & Trucks ^a	Population
Africa	22	1.1	0.3	45	62	104	85	22
North America ^b	-14	24.1	2.6	31	-2	45	34	19
South America	10	2.1	0.8	43	16	86	72	26
Asia	264	2.4	1.7	290	261	250	293	21
Eastern Europe	916	n.a.	n.a.	65	148	n.a.	n.a.	11
Western Europe	48	16.9	1.9		28	166	50	
Oceania	3	1.5	0.3	3	26	76	42	27
World	1,249	48.1	7.6	477	65	80	102	19

^aIncrease, 1951-60—1951 was chosen as a base year since complete motor vehicle data for 1950 are not available.

^bCanada and the United States.

Sources: United Nations, Statistical Yearbook, 1957 and Statistical Yearbook, 1961.

TABLE 2
WORLD MOTOR VEHICLES AND HIGHWAYS^a

Continent	Motor Vehicles 1960			Percent Increase in Registration, 1951-60		Road Mileage ^b	
	Total (1,000's)	Per 1,000 People	Per Square Mile	Automobiles	Trucks	Total (1,000's)	Per 1,000 Sq Mi
Africa	2,573	10	0.2	101	81	241	20
North America ^c	79,163	398	10.6	45	26	2,737	367
Latin America	4,175	21	0.6	84	80	160	20
Asia	3,771	4	0.6	225	280	905	159
Europe	28,390	71	14.4	267	53	1,420	742
(EEC Countries)	16,370	91	35.1	198	45	709	1,573
Oceania	3,373	259	1.1	95	42	240	77
World total	121,145	60	3.2	68	46	5,700	150

^aMotor vehicles include automobiles, trucks, and buses.

^bPaved roads include miles of roads with gravel or crushed stone or stabilized soil surface.

^cCanada and the United States.

Source: Motor Vehicle data from United Nations, Statistical Yearbook, 1957 and Statistical Yearbook, 1961. Highway data from International Road Federation, "World Highway Statistics-1960," Staff Report.

Poor maintenance of rolling stock has been an added problem. And in those countries where water transport might provide an important avenue of commerce, the potential is limited because of silting, absence of navigation aids, and seasonal interruptions due to weather.

Finally, there is general lack of well-trained personnel for the planning, management, or maintenance of an efficient transport system of any kind.

A good case can be made for transport as the key to national development, on the grounds that widening domestic markets is essential to economic growth. No country where there is a critical lack of transport facilities is moving ahead very fast, but some countries that have fairly impressive facilities also seem to be going nowhere.

BREAKING THE TRANSPORT BARRIER

It was not long ago that developed countries were just as immobile as the impoverished nations today; and one lesson to be drawn from their experience is that it took a

TABLE 3
THE MOBILE AND IMMOBILE NATIONS
(France = 100)

Country	Freight Mobility Index ^a	Passenger Mobility Index ^b
Canada	223.1	148.9
Australia	216.7	-
United States	189.0	147.2
Denmark	110.0	119.0
France	100.0	100.0
Sweden	93.0	104.5
United Kingdom	86.0	94.5
Argentina	63.8	68.0
Netherlands	58.2	69.3
Italy	45.3	53.2
Spain	33.2	34.8
Japan	30.5	46.3
Mexico	27.8	22.8
Israel	25.2	21.7
Brazil	19.7	19.8
Greece	17.8	18.7
Turkey	13.7	-
Colombia	11.3	9.2
Ecuador	10.2	8.7
India	10.0	11.5
Egypt	7.5	9.3
Thailand	7.2	8.0
Pakistan	6.7	8.3
Burma	5.3	5.5
Iran	4.7	4.3
Nigeria	4.0	3.5
Ethiopia	1.7	1.7

^aFreight Index = Average index for rail lines per 100 sq miles, ton-miles per capita; and commercial vehicles per capita. Transport data based on 1957-58 figures.

^bPassenger Index = Average index of the following: passenger miles per capita, passenger cars per capita, and rail lines per 100 sq miles, rail lines per 10,000 population, surfaced highways per sq miles, and surfaced highways per 10,000 population.

Source: United Nations, Statistical Yearbook, 1958 and Statistical Yearbook, 1959; highway data from The International Road Federation, "World Highway Statistics," Staff Report (1957 and 1958).

big push and large amounts of time and effort to make major transport improvements. In some instances the central government played the key role in planning, financing, and managing the endeavor, but in all nations there was some combination of public and private enterprise.

The appropriate mix in today's conditions will vary. It would hardly be fitting to suggest, for instance, that private enterprises vie with each other in the emerging nations to determine who could build the greatest mileage of railways or turnpikes in the shortest time for the greatest private gain. The days of the "robber barons" have passed. Yet it is difficult to say whether public enterprise can compensate for the disappearance of the pot of gold that rallied the pioneering spirit in the earlier days.

The question facing development planners today is whether—and how—the stages of transport progress from primitive immobility to 20th century aerial, highway, pipeline, and railroad mobility can be telescoped into a shorter time span. Although generally the underdeveloped areas are in the initial stage of primitive transport, many of them are operating in a mixture of all stages at once. Rural areas may be completely isolated, while major cities in the same country are served by modern diesel railways, jet airlines, superhighways, and motor buses. From this mixture, it is obvious that two dissimilar types of transport problems must be dealt with. The new nations do not have the leisurely time to develop and pay for their transport that older nations had; but at the same time, they can take advantage of the more sophisticated machinery to help them move more quickly. But if time is no obstacle, cost is. It is no longer feasible to allocate a major share of a nation's resources to transport.

National planning bodies have emerged as essential mechanisms for progress. A key question is how far a country should go in dedicating resources to transport. It will be the growing capacity to establish transport requirements in relation to development goals that will keep the transport program within bounds, and it will be the potentials of science and technology that will reveal the best tactics to hold cost and time to a minimum.

CHOICE OF TECHNOLOGY

Similar trends in transport prevail throughout the world. In nearly all countries trucks are used for short hauls and small shipments. For low-value commodities that move in large volume, water transport and railways still provide the principal methods of getting things moved. Other major trends include the long-distance movement of people by air, and the introduction of pipeline transport for shipment of oil and gas.

TABLE 4
PROPOSED OR PLANNED TRANSPORT INVESTMENT PROGRAMS, SELECTED COUNTRIES^a
(Currency items in millions)

Country	Total	Railways	Highways	Trucks and Buses	Water Transport	Ports	Air Transport
(a) Investment							
Argentina (in pesos)	182,427.0	100,204.0	69,874.0	-	12,349.0	-	- ^b
Chile (in escudos)	1,389.0	300.2	498.0	399.2	95.2 ^c	44.8	51.6
Colombia (in pesos)	2,467.6	326.3	1,822.5	-	7.5	129.3	182.0 ^d
Iran (in rials)	34,900.0	4,300.0	23,700.0	-	-	2,900.0	4,000.0 ^d
East Pakistan (in U. S. dollars)	269.4	104.7	54.8	29.9	-	77.3	2.7
West Pakistan (in U. S. dollars)	529.2	186.0	128.7	162.0	-	44.3	8.2
Philippines (in pesos) ^e	632.5	186.0	295.0	-	-	73.5	78.0
Senegal (in francs)	15,720.0	2,172.0	11,235.0	-	1,225.0	-	1,088.0
(b) Percentage Distribution							
Argentina	100.0	54.9	38.3	-	6.8	-	-
Chile	100.0	21.6	35.9	28.7	6.9	3.2	3.7
Colombia	100.0	13.2	73.9	-	0.3	5.2	7.4
Iran	100.0	12.3	67.9	-	-	8.3	11.5
East Pakistan	100.0	38.9	20.3	11.1	-	28.7	1.0
West Pakistan	100.0	35.1	24.3	30.6	-	8.4	1.6
Philippines	100.0	29.4	46.6	-	-	11.6	12.3
Senegal	100.0	13.8	71.5	-	-	7.8	6.9

^aProposed expenditures are for the following periods: Argentina, 1962-67; Chile, 1961-70; Colombia, 1962-71; Iran, 1962-66; East and West Pakistan, 1960-65; Philippines, 1963-67; Senegal, 1961-64.

^bAir transport was not included in the Argentina transport survey.

^cIncludes shipping only.

^dIncludes airports only.

^eWhen the private sector is added, the transport expenditures are as follows:

Purpose	Millions of Pesos	Percent
Railways	186.0	5.5
Highways	295.0	8.7
Ports	73.5	2.2
Airports	78.0	2.3
Airplanes	157.4	4.7
Trucks and Buses	1,953.3	57.7
Shipping	642.6	19.0
Total	3,385.8	100.0

^fWhen oil pipeline expenditures are included, the percentage distribution is as follows:

Purpose	Percent
Highways	59.4
Railways	10.8
Ports	7.3
Airports	10.0
Oil pipelines	12.5
Total	100.0

Sources: Argentina data from A Long Range Transportation Plan for Argentina, Transportation Planning Group, Republic of Argentina, Buenos Aires, 1962, Main Report, p. 75. Chile: National Economic Development Program for Chile, 1961-70, Government of Chile, 1961. Colombia: Ministry of Public Works, Republic of Colombia, Plan for Improvements in National Transportation (Report prepared by Parsons, Brinckerhoff, Quade, and Douglas, December 1961); 1962-71 expenditures based on the table, "Summary of Recommended Investments—All Modes of Transportation." Iran: The Plan Organization, Transport and Communication—Third Plan Frame, Teheran, 1961, based on Table I, p. 11. East and West Pakistan: Corps of Engineers, Department of the Army, Transport Survey of East Pakistan, Washington, 1961, Vol. 1, p. 23, and Transport Survey of West Pakistan, Washington, 1960, Vol. I, p. 29. Philippines: The Republic of the Philippines, Five-Year Integrated Socio-Economic Program for the Philippines, 1963-67, based on the table on p. 88. Senegal: Le Plan Quadriennal de Developpement, 1961-64, Dakar, 1961.

The United States, as an affluent society, has shown a markedly greater expansion in truck and pipeline freight traffic in the past two decades of enormous growth of freight movement by all methods. But in the underdeveloped nations, those with dense populations have been emphasizing railroads, and those with sparse populations have been emphasizing roads. Whatever the proportion, however, the combination of road and railway investment has absorbed most of the transport resources in the developing countries in recent years.

TABLE 5
DISTRIBUTION OF FREIGHT TRAFFIC, SELECTED ASIAN
COUNTRIES, 1957
(Freight traffic in thousands of ton-km)

Country	Total (ton-km)			Percent Distribution		
	Rail ^a	Road	Water ^b	Rail	Road	Water
India	73,415	4,550	5,950	88	5	7
Japan	48,991	13,724	41,000	47	13	40
Pakistan	6,684	438	4,960	55	4	41
Thailand	1,025	780	500	44	34	22
Burma	621	388	1,400	26	16	58
Indonesia	1,044	1,568	3,491	17	26	57
Philippines	190	1,558	300	9	76	15
Vietnam (S)	82	350	1,210	5	21	74
Cambodia	62	126	400	11	21	68

^aRoad traffic is estimated by multiplying the following assumed annual performance to the numbers of registered vehicles by type:

Year	Type of Vehicle	Capacity	Rate of Performance	Avg Annual Distance Traveled	Annual Performance
1957	Bus	30 pass.	0.80	40,000 km	960,000 pass.-km
	Pass. cars	5 pass.	0.40	12,500 km	24,000 pass.-km
	Truck	2½ tons	0.50	20,000 km	35,000 ton-km

^bExcept in the case of Japan, Indonesia and the Philippines, water transport refers to inland waterway traffic only, figures of which are worked out largely on the basis of the estimates of the number of vessels, inland country-boats, the average load factor and informed opinion regarding the average length and number of journeys performed annually. For Japan, Indonesia and the Philippines figures refer to interinsular freight traffic. In the case of Indonesia and the Philippines, estimates are made by multiplying actual tonnage carried by an average haul of 500 km for Indonesia and 200 km for the Philippines.

Source: Economic Development and Planning in Asia and the Far East, VI. Transport Development, U.N. Economic Bulletin for Asia and the Far East, Vol. XI, No. 3, December 1960, pp. 6-7.

In early stages of development, when low cost movement of bulk commodities is especially important, waterways can provide excellent cheap transport for both short and long hauls. Improvement of the navigability of waterways and use of newly developed diesel-powered tow boats—or even putting small motors on country boats, as the Thais have done in Bangkok—could help expand the usefulness of water transport in many places.

In the absence of water transport, of course, railways provide the most economical way of carrying bulk materials long distances, and in many countries they are the principal method of mechanized transport. Railway mileage is actually very small in much of the underdeveloped world, however, and the question is arising as to whether industrialization will result in a new railway age for Africa, Latin America, and the smaller countries of Asia.

Rail movement, to be economical, requires sufficient traffic moving over a given route to permit the economy of large-scale operations; both traffic density and length of haul are key factors in judging whether a heavy investment in rail transport is justified. Short hauls and/or light traffic make for high unit costs for rail freight.

Three main facts have led to the recent worldwide emphasis on roadbuilding, instead of railway building, for transport needs. One is that, along with better roads, the economy and reliability of truck haulage has vastly improved; secondly, where traffic is light, this is the only feasible method of mechanized transport; and thirdly, the service can often be faster and more flexible than rail operations with their complicated schedules, fixed routes, and loading problems.

In some countries, where the terrain is rough and difficult to cross, moving cargo by air has proved to be relatively economical. But to perform efficiently, an air vehicle is needed that moves at relatively slow speed, in order to reduce the cost of

ground and navigation facilities, increase safety, and reduce operating complexity. If such an aircraft could be built at low cost, it might appreciably alter the character of the transport investment program in many developing nations.

The use of pipelines also offers interesting possibilities, particularly since it may be feasible to move some solids as well as liquids and gases by this method. The practicality of pipelines for developing countries lies in the ability to traverse even the most difficult terrain, to be almost unaffected by weather, and to furnish transport of petroleum products at low unit costs. Maintenance is also simple and does not require a large number of highly trained personnel.

In addition to the cost and service characteristics of transport methods, another factor to be weighed in making a wise choice of alternatives is the effect it will have a on the economic activity and living standards of the country. Different methods require different inputs of capital, foreign exchange, managerial talent, and technical skills. They take different lengths of time for completion, and afterwards have varied requirements for maintenance and operation. The outputs will also differ, including the ability to create capital, earn foreign exchange, train entrepreneurs, foster supporting economic activities, and provide jobs.

A major shortcoming in the process of selecting among transport technologies is the hesitancy to adopt innovations, owing to traditional attitudes in developing countries. As a result, many of the plans for future development seem to deny the transport revolution and favor instead a reconstruction of the past.

CARRYING OUT THE PROGRAM

Every country, regardless of its state of development, is burdened by the high cost of moving. Virtually all nations operate their transport at a deficit, and often rates are below out-of-pocket costs. While to some extent this can be corrected by more realistic rate structures, it is also necessary to avoid the opposite danger of achieving self-support by putting rates so high they discourage use of facilities and thereby interfere with the goal of generating new economic activity.

User taxes are one acceptable way to help pay for transport, but the extent to which they can be adopted varies with the type of transport. It can only be said, therefore, that different circumstances make it necessary to tailor price and tax policies to the particular economic and social environment served.

The cost problem is especially acute for roads and railroads, which account for two-thirds of all expenditures for transport. In the railway field, the global picture is one of chronic deficits stemming in part from the persistent idea that railways are capable of providing every type of transport service with maximum efficiency and economy. The result is that they carry too much unremunerative traffic.

It is important, therefore, that railway managements be empowered to determine what price policy is appropriate in the light of the overall circumstances in a particular country, and that public policies take into account the economic advantage of carrying part of the freight by road. Road deficits may also be expected to persist, however, because the economic returns from road use are often difficult to reflect in prices paid for service. But roads are needed, regardless of whether there is a railway, because they serve the unique function of providing access to land and resources throughout their length, and accommodating all kinds of traffic, from primitive to mechanized.

The problem of financial support is closely related to the organization and administration of the transport program. Unfortunately, in developing countries as in many developed nations, neither physical nor financial problems are viewed in relation to a "coordinated" transport system for highways, rail, water, and air. Typically, each method of transport is studied separately because most experts are specialists in one aspect of transport only. The focus should be on the economics of alternative technologies.

The desire to provide a better organizational and administrative environment has led some countries—with prodding from the World Bank—to alter their administrative approach to transport. One trend has been toward a public authority, especially for the operation of railways and ports. Another has been to lodge all public transport

TABLE 6
 CUMULATIVE AID FOR TRANSPORT, UNITED STATES
 AND INTERNATIONAL AGENCIES^a
 (In millions of U. S. dollars)

Aid	Total	Percent
I. By Source		
IBRD and IDA	2,508.2	38.3
Export-Import Bank	2,136.2	32.6
ICA	979.9	14.9
DLF	561.9	8.6
AID	173.9	2.7
EEC (European Development Fund)	195.7	3.0
Total	6,555.8	100.0
II. By Method of Transport		
Railways	2,537.4	38.7
Roads	2,080.9	31.7
Ports and inland waterways	562.0	8.6
Shipping	88.1	1.3
Air	671.7	10.2
Pipelines	64.0	1.0
Miscellaneous	377.8	5.8
AID	173.9	2.7
Total	6,555.8	100.0
III. By Region		
Africa	862.0	13.2
Asia and Middle East	2,826.9	43.1
Western Hemisphere	2,016.2	30.8
Europe	690.7	10.5
Oceania	159.6	2.4
Non-Regional	0.4	-
Total	6,555.8	100.0
IV. Transport Equipment—AID		
	700.0 ^b	
Grand Total	7,255.8	

^aOver the life period of the aid organization to June 1963, except for the AID data which cover only through June 1962 and the European Development Fund figures, as of January 1963.

^bTransport equipment aid expended by AID and its predecessors under non-project type aid between June 1952 and June 1963.

Source: "European Development Fund: Balance Sheet 1958-62," Information Memo, European Economic Community, Brussels, January 1963; W. Owen, Strategy for Mobility, Brookings Institution, 1964, Appendix tables A.9, A.10, A.12, and A.13, and Tables 6.1 and 6.4.

responsibilities in a ministry of transport, with its own research and planning staff. Or if neither of these is adopted, then the national planning agency, if there is one, may be left to coordinate various plans. But the function of a planning commission is to help relate transport projects to development goals, and it is generally too late at this stage to weigh individual project decisions.

With respect to transport operations, another type of administrative problem arises. Experiences in Canada suggest that a key element in improved and efficient operation is to view the several carriers as an integrated system, rather than as a series of component or unrelated parts. Such an approach could lead to rate policies and traffic allocations that would encourage movement by the most economical channels. Various mixes of public and private enterprise can be involved in the resulting system.

FOREIGN AID

Whatever the domestic efforts, most developing countries will need help from the outside—more capital, foreign credits, entrepreneurs, and technical skills. How much of this help is now being provided? And what more is needed?

In this decade of development, it can be said that extensive assistance has been provided, and that many of the results have been impressive. The principal agencies have been the World Bank, the International Development Association, the European Development Fund of the Common Market, the Export-Import Bank of Washington, and the United States Agency for International Development. In the postwar years, these agencies have given or loaned a total of \$7.3 billion for transport development, with the World Bank and IDA providing the largest segment of the total. Most of this has gone for railroads and highways.

With all this help, scarcely a dent has been made in the transport barrier. If the growing challenge of meeting the needs for money and materials is to be met, the necessity for larger amounts of financial support is clear. And equally clear is the need for the transfer of knowledge and experience from the rich nations to the poor.

Students of foreign aid objectives have identified six discernible motives at work among donor nations, including the pursuit of humanitarian purposes, provision of subsistence aid, furtherance of military objectives, offering of political rewards, granting of prestige foreign aid, and the promotion of economic development.

In the transport field, as in others, the first five may continue to be provided on a bilateral basis, or through international agencies. But the sixth, which is most important, should be granted on the basis of an overall economic strategy adhered to by both recipients and donors, regardless of the selfish interests of the latter. Aid for this purpose should be judged in terms of what is best for the aided country.

A good case can be made for funneling a much higher proportion of loan and grant programs through international arrangements that remove mixed motives and make it easier to impose performance standards on the recipient nations. Such a consolidation would also help alleviate the acute personnel shortage problem through pooling information and experience. Pre-investment surveys, in particular, should be accomplished through international auspices, with the goal of achieving a standard acceptable to all agencies that might be called upon for money.

Another new direction for improved foreign assistance efforts lies in viewing the task as a long-term operation which includes maintenance, good management, and sound financing as well as initial construction. Closer controls over financial assistance through international agreements would also make practical a system of grants instead of loans.

This use of grants offers the only promise of stepped-up efforts without prohibitive debt burdens for the developing nations. They can be made on a businesslike basis if matched by the recipients on a sliding scale determined by financial capacity. The European Development Fund of the Common Market, used principally for African nations, suggests a pattern for applying an agreed-upon percentage of the gross national product of the donor nations for such aid to the underdeveloped world.

One major step toward improving transport planning would be the establishment of a World Transport Center to serve the United Nations as a focal point for research and education. This could provide for an interchange of experience among member countries in various parts of the world, would promote regional transport solutions, and would direct research and training efforts toward the solution of common problems.

A TRANSPORT STRATEGY FOR DEVELOPMENT

Global transport and communications have set the stage for man to think his way as well as work his way out of bondage. But to date, the transport revolution has been contained in scattered economic islands where mobility and some degree of prosperity go together. There are still vast areas where immobility and poverty persist.

There are no easy guides for the transport policymaker. The most urgent need may be simply to create a state of mind in which transport decisions are clearly seen

as an integral part of other policy decisions. And this will mean giving up some long established misconceptions.

The misconception that causes the most trouble is that transport is a separate sector of the economy, where in reality it is a link among sectors. Improvement of transport is justified only if it serves other purposes. Another misconception is that each method of transport can be planned separately, for clearly what is done in one part of the transport system has important bearings for the whole.

One cannot establish a simple goal for transport, such as for steel production or food consumption. It is up to those responsible for the development of agriculture, industrialization, and other targets to say how much transport will be required.

Thus, within the poor nations, the strategy for mobility must start with a thorough knowledge of the country's resources, its development potentials and objectives, whatever transport plan it may have in existence, how various types of transport would serve the national purpose, how transport can be paid for, and how it should be managed and operated effectively.

Improvement of transportation in the United States, for example, requires many of the same approaches called for in less developed countries. This includes the formulation of desirable goals for the nation and for the community, based on a consensus as to both needs and priorities. In establishing a clearer set of goals, whether at the national or the community level, there will be a better understanding of how transport can help to achieve these objectives as an integral part of the physical developments proposed in other sectors. For example, there is a close relation between urban transport facilities and the design of the city, and between transport services and the functioning of the city. Similarly, effective distribution facilities for industry have important implications for industrial location, costs, and markets.

In the United States, as elsewhere, there is pressing need for viewing transportation problems as a whole, to assure that maximum advantage is taken of all available technologies. Physical interrelations among the several methods of transport are needed to permit all forms to play their appropriate roles in a total system. And the conduct of research and development to apply the fruits of scientific innovation presents a continuing challenge and opportunity.

Both the rich countries and the poor have much to learn from each other. The great need today is for a global interchange of information and experience, greater support of transport research and training, and continuing efforts to overcome the world's transport barriers through cooperative action. For if the world's idle resources can be put to effective use through easier access and low-cost movement, the result may be a key to improving living conditions everywhere.

As the dimensions of the world community continue to grow smaller with advances in transport and communications, higher standards of living on one continent cannot fail to have a desirable impact on all the others. An effective strategy for transport and communications may prove to be the most important single factor in the global effort to bridge the gap between physical resources and human needs.