Infrastructural growth and developmental planning: A comparative study of road infrastructure in the national development of ASEAN countries

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The road itself seems to speak to him: ". . . I shall change everything and everybody . . . . I am abolishing the old ways, the old ideas, the old law; I am bringing wealth and opportunity for good as well as vice, new powers to men and therefore new conflicts. I am the revolution. I am giving you plenty of trouble already, you governors, and I am going to give you plenty more. I destroy and I make new. What are you going to do about it? I am your idea. You made me, so I suppose you know" - Joyce Cary, Mister Johnson *(New York: Harper & Brothers, 1954), pp. 186-87.*

The importance of transportion in national development is generally accepted although the extent to which transportation (and its different modes) can play a catalytic role is questioned. Transportation is one form of social infrastructure; it is also a form capital formation for any society wishing to further economic growth. Galbraith, referring to economic development, has argued that "a highly efficient transportation and an economic and reliable source of power are indispensable. With these available, something is bound to happen; without them, we can be less sure". [1] A report by the U.N. Economic Commission for Africa, reiterated a common observation when it commented that the material development in that continent could be summed up in one word, namely, transport. It argued that "improved transport is certainly a prerequisite for any type of development". [2] The importance of improved transport infrastructure may be evinced from the large allocation to this sector: countries are known to invest between 25 to 30 percent of national capital formation in the transportation sector.

This emphasis is not too surprising. Transportation is the link between geographically dispersed markets and settlements whose growth is dependent on an infrastructure which can be provided in efficient amounts and at efficient rates. Leferber sums up neatly when he said that "efficient pricing of regionally separated activities requires that the difference between the prices of homogeneous goods at different locations should not exceed the marginal cost of transporting these goods". [3] Transportation facilities thus contribute in determining the patterns and rates of economic growth and whether the factors of production may be more optimatly matched.

On non-economic considerations, transport infrastructure is equally valued as a factor in social communication and national consolidation. The ability and speed in linking variously scattered communities affects acceptance of political authority. This is even more relevant for the bulk of the developing countries which have only a brief history of infant nationhood and which have still to tackle the problems of national consolidation. External threats by "less friendly" powers and domestic threats from groups with views radically different from those of the ruling elites continue to plague many of these nations. Infrastructural development, especially road transport, is viewed a priority item because it could be used to minimise these threats or conversely, strengthen the capabilities of the ruling regimes to confront them. For example, national governments are known to have re-routed communication links to "more friendly" countries even though the economic rationale for doing so may not exist while similarly, an expanded network of infrastructure in the country is also welcomed by security forces in facilitating logistics support against scattered insurgent groups. These non-economic reasons sometime outweigh the economic considerations in the planning of additional network capabilities.

While the importance of transport infrastructure is generally recognised, considerable differences exist on a range of concomitant issues. What, for example, should be the appropriate strategic-mix in terms of infrastructural facilities? How should the modes be financed and priced? What priority to be assigned to the build-up urbanised areas and the less developed regions and how will this determine strategy in economic development? Should infrastructural development preceed demand or should it be a response to needs? The list of questions can be extended.

There are no clear-cut solutions. Infrastructural development is not the exclusive concern of the planners (spatial and economic) even though they may help influence decisionmaking. Neither can the political leadership rely exclusively on economic considerations. Besides, not all the parameters, such as improved well-being among those affected by proposed infrastructural development, can be comprehensively accounted and adequately quantified. [4]

The governments are increasingly called to shoulder the cost of infrastructural development. Apart from the scale of the costs involved, it is generally argued that such developments affect the community and the government, rather than the private sector, should assume the cost as part of its responsibility to the society. Also, the returns to investments made in plant facilities (such as roads, railways, or airports) are difficult to ascertain partly because of different categories of user-demands, a feature more so in regard to road transportation.

Road transport is probably one mode which affects

the people most intensely. It is characterised by a general purpose capability and it is also the most flexible in that access is theoretically possible on all points of the roadways. Collector or feeder roads could always be connected to the main or primary distributory roads. Secondary development can grow along the lengths of these roads. Accessibility from point to point is also complemented by a wide range of available transport modes (such as cars, freight trucks and various other forms of public transport). Entrepreneurship is thus fostered while the diffusion of rudimentary technical skills for maintenance of transport vehicles can have considerable economic and educational potential. [5]

The responsibility for road development unfortunately does not end with the provision of these infrastructure; in most instances, it is only one aspect of a syndromic development ranging from infrastructural maintenance and expansion to regulation and coordination of these linkages. A wide range of human activities depends on this infrastructure which has become an indispensible aspect for the community's continued well-being. A large number of governmental agencies is thus involved in the various aspects of road development. Intra-agency and inter-agency cooperation and coordination is thus a premium, but because road transportation serves varied needs and various user intersts are involved (including governmental agencies) cooperation and coordination among these agencies may not always be attained. Indeed, a major bottleneck in road development is not just the physical constraints resulting from overloading of system capacities but the bottlenecks which resulted from failure to ensure effective cooperation and coordination of these agencies.

Finally, a major aspect of road development is that while it links the cities to the region, it also has the effect of aggravating the problems in the cities by channelling people from the rural areas to the cities. The phenomenal growth of cities both in the West and in developing countries is largely due to the ease with which the rural people are able to come to the cities. While the flow has to some extent slowed down in the West, for the developing countries this trend continues to persist. Short of drastic measures such as those implemented by the new regime in Kampuchea to "empty" the cities, the cities unfortunately have become repositories for excess people from the regions. Lured by the presumed attractions of city life and spurred by pervasive underemployment in the rural sectors, these "urban villagers" are often unequipped for the demands and skills required in the cities while their physical presence strain the available facilities and resource-base of the cities. They thus contribute much to the anomie and restlessness in the cities. Other factors such as the growing environmental costs due to pollution and the physical hazards of urban transportation add to the growing problems of cities. Road development thus may have mixed blessings.

This paper examines the relationship between infrastructural growth and development planning in the ASEAN countries. The scope is restricted to road transportation and the role it plays in national development. The first section discusses the state of infrastructural development in these countries and the extent to which road transport can assist in national development. The second section examines the administrative agencies involved in road development and the attendant problems of coordination and cooperation. The third section analyses some of the more common themes resulting from existing pattern(s) of road development such as the effect on urbanisation. It should be stressed that in a paer of this nature and because of the non-availability and sometimes, non-comparability of country data (because of different classification methods adopted), statistical analysis can very often be handicapped or accepted with certain caution. These qualifications, however, will not detract from the main context of the paper.

THE ASEAN COUNTRIES AND ROAD DEVELOPMENT

The five countries of Indonesia, Malaysia, Philippines, Singapore and Thailand grouped together to form the Association of Southeast Asian Nations (ASEAN) in 1967 as a concerted collaborative effort at regional cooperation. These five countries are under the control of regimes which are staunchly anti-communist; indeed, apart from neutralist Burma and the new state of Papua-New Guinea, the ASEAN countries constitute the only group of non-communist countries in Southeast Asia.

The ASEAN countries have enormous resources. They are responsible for the bulk of the world's primary commodities such as rubber and palm oil. Minerals, availability of arable land, and the more recent extensive exploitation of fuel and gas - all these indicate the range of resources in the region. This is not to underestimate the other resource - manpower - which, partly as a result of these congenial factors, has multiplied to approximately 210 million in 1970 (or a projected figure of 361 million by 1990) for the five countries.

It is necessary to point out the considerable differences which exist among the five countires as general statements tend to gloss over, and thus distort, the analysis. Differences exist among the five countries on ethnic composition, territorial size, pattern and rate of economic development. On the one extreme, there is the city-state of Singapore, limited to an area of 581 square kilometers and whose 2.2 million population has to depend on industrialisation and services to sustain what is generally accepted as the second highest level of income in Asia. On the other extreme, there is Indonesia which has 3,000 islands covering an area as large as the United States. It is the sixth most populated country in the world and is largely dependent on agriculture and extractive industries for economic growth The other countries - Malaysia, Thailand and Philippines

Table 1 - Some Basic Data on ASEAN Countries

Country	Populations (1970) (million)	Total Area (m.sq.km.)	Population Density (per square kilometer)	GNP (1970) in million US dollars	Per Capita income (US dollars)	Agriculture as percent of GDP	1970 Total imports (million US dollars)	1970 Total exports (million US dollars)
Indonesia	121.2	1.492	81	7881.9	67.9	44.8	809	883
Malaysia	10.8	0.33	32	3340.3	380.2	31.2	1757	1468
Philippines	38.5	0.300	128	8055.7	216.8	37.5	1967	1210
Singapore	2.0	0.001	3528	1555.7	770.2	2.9	1554	2461
Thailand	35.8	0.514	70	6230.4	179.3	28.6	697	1252

Source: U.N., *Statistical Yearbook for Asia and the Far East, 1970. Far Eastern Economic Review* and Statistical Yearbooks of ASEAN countries.

- fall somewhere along this continuum although they, like Indonesia, tend to depend more heavily on agriculture and extractive industries as absorbers of manpower. The details are summarised in Table 1.

The brief sketch does not indicate the complexity of the problems faced within these countries. Population and economic activities (except for Singapore) are not spread out evenly with implications for economic growth and political stability. In Indonesia, for example, more than 60 percentof the population are found in Java and Madura - two of the smaller islands of the country. Unless effective measures (such as transmigration of people to other islands or family planning) are initiated, these two highly populated islands are unable to absorb additions to their already high population concentrations notwithstanding the extremely fertile agricultural land or the over-expanded tertiary sector located in the capital city of Jakarta. In Malaysia, development in concentrated along the western belt of "Peninsula Malaysia"; in Thailand, activities and population centres are largely located in the Central Region; while in Philippines, the position is assumed by the main island of Luzon. For the ruling elites in this region, a primary task is to find possible solutions so that existing economic and population patterns can be modified without extreme dislocations or adverse effects on the economy. This is a most difficult challenge in view of the high population growth rates (around 2 to 3 percent a year) and the magnitude of other problems (political and economic) confronting them.

Developmental planning is often seen as the solution by the political elites. Through developmental planning, it is hoped that priorities can be clarified while problem areas identified and targetted for solutions. Malaysia, for example, has formal planning since 1955 when the First Malaya Plan was launched. It has completed two Five-Year Malaya Plans and is now on the Third Malaysia Plan. Indonesia is on the later stage of its second development plan or Repelita II. Thailand and Philippines have formal planning. Although Singapore discarded formal planning, it did experiment with formal planning when the first State Development Plan was initiated in 1960.

The use of formalised development strategies is thus aimed at ensuring optimum utilisation of resources and simultaneously improve the overall well-being of the people. The objectives of Repelita II, for instance, "provides guidelines for the creation of expanding employment opportunities . . . a rising level of income, a more equitable distribution of income, a more even distribution of the gains of development among the various regions of the country, greater economic and social integration of the regions into one effective national entity, and an enhanced quality of life, including environmental, cultural and nutritional aspects of life . . ." [6]

With the exception of Singapore which does not have any significant rural base, the other ASEAN countries place priority to the rural sector. There is the underlying belief that the rural sectors (including the regions) have to be uplifted. This stress is made for various reasons ranging from desire to rectify imbalances in favour of the urbanised areas, to restructuring of society to favour a more balanced equitable distribution of job opportunities and income among the diverse ethnic groups.

To attain the outlined development objectives, the ruling elites place emphasis on road development. The two Malayan plans (1955-64) focus on provision of penetration or feeder roads to link outlying areas with existing transport network. This was regarded necessary for the attainment of other objectives. The first six year plan of Thailand (1961-66) allocated some 30 percent of total developmental expenditure to transportation and communications while Repelita I sought to upgrade and rehabilitate about 50 percent of existing roads as only 5 percent of the network was classified to be in "good" condition (that is, no potholoes or corrugations). It is hoped by the second plan period, the proportion of damaged roads would have dropped from the once-staggering figure of 41 percent to only 9 percent. Even in Philippines, road construction and improvements were assigned top priority. [7]

The attention on road infrastructure is welcome, if not belated. To begin with, the network as found in the ASEAN countries were constructed rather late and were not designed for the capacity found in present days. In Thailand, the first long range programme for highway development was prepared in 1936 on the basis of an economic survey then undertaken. Although it envisaged a total system of 14,900 kilometers, this figure was attained only lately and the system then was only expected to meet minimal traffic requirements of that period. Late construction in some instances were compounded by sheer neglect. In Indonesia, for instance, the network was largely prewar and it was left to deteriorate until the rehabilitation programme was initiated under Repelita I. Road shoulders and drainage were in disrepair. The magnitude of the rehabilitation programme of Repelita I can be seen from the rehabilitation or improvement to 17,225 of the 32,531 kilometers of roads and to 80,000 meters of bridges. [8]

Secondly, the physical environment takes a toll on existing infrastructure. The high rate of precipitation, the rugged terrain and climate (such as the typhoons) make it necessary to regularly maintain these roads before they are damaged or washed away. This is particularly so as not all roads are paved. As shown in Table 2,

Table 2 - Roads by Types of Surface Levels (percentages in parenthesis)

	Asphalt bituminous or equivalent		Gravel		Earth Surface		Total (kms)
Indonesia: (1972/73)	23633	(26.4)	45212	(50.6)	20533	(23.0)	89378
Malaysia: (i) Peninsula Malaysia (1971)	15098	(84.8)	2039	(11.5)	665	(3.7)	17802
(ii) East Malaysia (1970)	1004	(16.4)	3338	(54.6)	1771	(29.0)	6113
Philippines (1973)	17442	(18.8)	46149	(49.8)	29106	(31.4)	92697
Singapore (1974)	1665	(77.3)	—		490*	(22.7)	2155
Thailand (1971)	11462	(43.0)	6543	(24.6)	8630	(32.4)	26635

Sources: *Statistik Indonesia, 1972/73* (Jakarta: Biro Pusat Statistik, 1974); *UN Statistical Yearbook for Asia and the Far East, 1972; National Transportation System* (Manila: DPWTC, 1975); *Singapore Yearbook of Statistics, 1974/75.*

Note: * This refers to local unimproved roads. Some of these could have gravel surface level.

a large proportion of the roads in the ASEAN countries are largely gravel or earth roads, most of which are seasonal in use and with limited capacities. Even in paved roads, the toll resulting from overladen vehicles could be exacting as instances in Thailand and elsewhere have shown. [9] The deterioration is also speeded up if the soil surface is prone to periodic water-logging. [10]

The attention to road development is also prompted by the inadequacy of existing network. In Thailand, for instance, the major highways to the regions were constructed rather recently. The Bangkok-Korat-Nongkhai highway was completed in 1964 thereby effectively linking the capital with the Northeast region. Yet, on the whole, the ASEAN countries are far from attaining road sufficiency as shown in Table 3. Indeed, road development in most instances drop behind corresponding

Table 3 - Road Transport in ASEAN Countries: Basic Data for 1971

Countries	Total number of vehicles (excl. motor-cycles)	Length of road in km.	Total area	Density		Length of railways in km.
				Metres of road per sq.km.	Metres of road per vehicle	
Indonesia	392,100	84270	1492,000	56	214	6630
Malaysia *	385,300	23484	333,000	70	61	2313
Philippines	468,200	73532	300,000	245	157	1052
Singapore	204,000	1973	581	3396	10	negligible
Thailand	284,700**	26635	514,000	52	94	3765

Source: See Table 1.

* Peninsula Malaysia is very much more developed than East Malaysia. Thus while the overall density is 70 meters per sq.km. for the whole of Malaysia, the density in Peninsula Malaysia is 135.
** Figure for 1969 only.

increases in motor vehicles. In Philippines, for example, private motorcars doubled between 1968 and 1974. Hefty increases in vehicle population are noted in the other countries, except in Singapore where tough fiscal and regulatory measures led to a tapering off in car population.

The emphasis on infrastructural improvements will continue right into the foreseeable future. This is prompted by two other considerations. To begin with, the present network in the ASEAN countries have already attained or are rapidly attaining over-capacity as seen from the report of the Road Transport Survey of 1972. [11] Roads will continue to be the most popular mode of transport within these countries. The Road Transport Survey indicates that even in 1970, the five ASEAN countries would have 65.2 billion passenger-kilometers as compared to 8.2 and 2.0 for railway and air transport or 86.5 percent of all domestic passenger travel. Projections for intercity base into the 1990s indicate an annual growth rate in the ASEAN countries of 8.5 to 13.0 percent. Unless the network can be expanded considerably, a slowdown in pace of economic growth resulting from over-capacity in existing transport linkages is inevitable.

Secondly, the existing networks are unevenly distributed. The main islands or regions receive a fair share of the available road infrastructure; the outlying regions or islands are largely neglected. Thus in the Philippines, it is not surprising that the areas in or around Metro-Manila tend to have the densest network. In Indonesia, the islands of Java and Madura have 33 percent of total network although they constitute 7 percent of total land area. With the growing vehicle stock and with growing demands for greater mobility, the governments will be pressured to give even greater attention to expand such infrastructure. Already, in the four-year highway programme (1970/71 - 1973/74), the Philippine government envisaged an investment of 1.8 billion pesos which would be expended in strengthening 3,500 kilometers of primary roads, 2,200 kilometers of secondary roads and construction of 4,400 kilometers of new roads. It is hoped that these improvements would result in a structurally safe and adequate system of major roads supported by integral networks of secondary and feeder roads. [12]

As shown in Table 4 below, the total planned investments in highway development in the ASEAN countries between 1970 and 1990 is in the region of US$2.7 billion. This excludes investments on feeder roads which these governments would invariably undertake. By comparing to planned investment in railway in these countries over the same period (between US$261.2m and US$301.2m), it is beyond any doubt that the national governments' belief in the importance of road transportation remains unshaken.

Table 4 - Total Planned Investments in Highway Development of ASEAN Countries, 1970-90 US$ (in millions)

Indonesia	575.6
Malaysia	333.5
Philippines	445.2
Singapore	28.7
Thailand	1276.2
	Total 2659.2

Source: Extracted from page 318, *Road Transport Survey* (Asian Development Bank, 1972), Volume Two, Part One.

Improvements to road infrastructure will thus take place in the form of addition to the existing network or improvements to existing roads. While these two aspects will be carried out simultaneously, differences in emphasis can be detected. In West Malaysia, the major additions are largely in the form of new links between the East and West (such as the East-West highway) as the arterial highways linking the capitals with the regions are completed. Attention is also focused on upgrading existing network either through improved surface treatment or expanding capacities by broadening the existing roads. In Singapore, the pattern of primary distributory roads or expressways is being constructed which would enable all parts of the island-state within direct accessibility without having to go through the densely built city areas. The primary distributory roads also link the public housing estates and the industrials areas, thus contributing to greater economic growth through reduction of journey and congestion time. At the same time, congested stretches of existing roads have also been widened. In Indonesia and Thailand the emphasis will largely be on improvements to existing network.

When then is the contribution of road infrastructure

to economic growth? In terms of capital formation, road infrastructure and transport equipment/stock form a sizable component. In Thailand, for instance, expenditure on transportation as a percentage of GDP has increased throughout the last decade, the bulk of which largely going to road transport. The extensive highway construction programme, rising costs of transport operation and vehicle ownership have contributed to a situation in which almost a quarter of the gross fixed capital formation was in transportation. Transport equipment tends to form a much higher percentage than the costs of transport construction projects. In Thailand in the period of 1966-69, the ratio was almost 2:1. As most of the equipment has to be imported and as the propensity for acquiring these will continue to increase, the effect on balance of payments is likely to be serious. This problem can be put in perspective for the ASEAN region when it is estimated that the purchase of vehicles, spare parts and oil between 1970-90 is likely to be ten times the investments allocated to highway development for the same period.

On the other hand, improved infrastructure does contribute to increased economic activities. As most of these ASEAN countries are dependent on export of primary produce and mineral extraction, an efficient infrastructural network is vital in reducing costs and also to make these exports possible. The Bangkok-Korat-Nongkhai highway in Thailand, for example, reduces travelling time between Bangkok and Nongkhai by 8 hours while the alignment of the highway results in a saving of 140 kilometers. Micro-surveys conducted elsewhere in Thailand and Malaysia also indicate an increase in economic activities and mobility resulting from construction of specific highways or roads. [13]

It should however be stressed that the mere provision of such infrastructure does not necessarily result in positive economic growth. Attitudinal changes among those people affected by such development and the presence of complementary social services necessary to support a self-sustaining process of investment, marketing and production is essential before tangible growth can be seen. A study on transportation and modernisation in Malaya noted that while road and rail act as an integrating link in the modernisation of that country, it was the rise of extractive industries like tin and later, rubber which provided the bases for spatial integration and development. As a result of these activities, the "administrative-transport web" was thus extended over the country while the impact of modernisation was diffused slowly to include peripheral areas serviced by feeder and interconnection linkages. [14]

Road infrastructure can accelerate modernisation and thus further national development. This belief underlines the strategies of the political elites when they seek to physically integrate their countries through this infrastructure. But improved well-being is not necessarily positively correlated with economic growth as available surveys show that the modern facilities (such as community centres, outpatient clinics and school) which came along with the road infrastructure are used by the people without any substantial changes in their income. [15] This is particularly so in areas in which subsistence agriculture plays a dominant aspect in the economic life of these people. More important to the national elites - than just economic growth - is the growing confidence and positive commitment to the national governments by these people who no longer feel neglected or who now perceive that they have access to larger socio-economic benefits. Indeed, this explains why infrastructural construction forms an integral aspect in counter-insurgency programme. The Accelerated Rural Development Programme which affected 42 provinces in Thailand seeks to provide economic and social betterment through the provision of roads (and thus, accessibility) and other development projects.

THE ADMINISTRATIVE AGENCIES IN ROAD TRANSPORTATION

As indicated in the introduction, a major problem is to ensure that agencies which are responsible for infrastructural development could establish a working relationship of reasonable harmony. The task of securing this relationship, is not easy notwithstanding the goodwill of all the agencies involved. Part of the difficulty in attaining this relationship stems from the numerous operations (and hence, the number of agencies) which are required in infrastructural development. Infrastructural development affects and is affected by land use and other forms of planning. Similarly, it leaves indelible impact on locations of economic activities, consumption and investment patterns and even other forms of lifestyles. There are thus many categories of users and user-needs. At the same, the government in meeting infrastructural linkages also have certain expectations and requirements. In providing these facilities, a number of agencies were created to handle these various issues. Problems are bound to arise with respect to provision, operation and utilisation of such facilities. Conflicting, as well as complementary, interests among the agencies are thus common. Smooth inter-agency and intra-agency cooperation could hardly be more emphasized. For example, the expansion in road network would invariably lead to the acquisition/importation of more transport equipment (such as vehicles) and it is necessary to weigh these induced imports against balance of payments and effect on patterns of consumption, savings or investment. Political elites are also under pressure to offset the costs of infrastructural investment by hiving these costs on to the motorists in the form of higher road and other taxes. While the major issues will have to be resolved by the political leadership, according to its set of priorities, nonetheless agency interests cannot be dismissed since the latter do influence decisionmaking with regard to such issues.

In the ASEAN countries, the more common agencies which are found to have a vested interest with regard to infrastructural development are those involved in budget-allocation, revenue-generating, public works, communications, and planning. Other agencies such as public housing, public utilities, and even security and defence do have an interest in plans pertaining to transport infrastructure as it could affect their own development plans and priorities. Generally, the communications agency would have a major - though not overriding - influence with regard to formulating and implementing communications policy. These could also include regulation and licensing of vehicles, approving different forms of public carriers (and the rates to be charged). The public works department, as the name implies would be responsible for construction of such projects according to acceptable design standards. The budget bureau would decide on priorities on disbursement of funds while the revenue-generating agency would seek various ways (including from users of transport facilities) to raise the necessary funds required. The planning department would seek to offer advice on land use and related needs and will try to integrate transport needs with other sectoral demands to ensure a more optimum use of resources. Then there are the regulatory bureaus such as the police which are usually responsible for other enforcement and related activities.

While the definition of responsibilities seems clear-cut, the modus operandi is often compounded by other

problems. The existence of different "layers" of government the presence of over-lapping authority, the continuation of ill-defined channels of communication, coordination and command, and inter-agency competition for power and influence are some of the common features which could slow down bureaucratic responsiveness with regard to provision and operation of these infrastructural development. A brief description of the agencies involved in these ASEAN countries in thus necessary to show how such problems could arise and what possible solutions have been proposed to overcome them.

In Indonesia, the responsibility for road development is shared between the central, provincial and municipal governments. The nationa government is responsible for the highways or major arterial routes in the country. The major agencies involved at the national level include Bappenas or the National Development Planning Agency, the Department of Finance, and Department of Public Works/Directorate-General of Highway Construction. The national communications agency, the Department of Transport, Communication and Tourism (DOC), is not responsible for highway planning, a function which is assumed by Public Works Department. This is quite surprising insofar as this ministry is responsible for planning and associated activities in the transport, communications and tourism sectors. Plan proposals for implementation had to be in line with the National Development Plans (Repelitas). The prior approval of Bappenas (which is involved in coordinating and integrating inter-sectoral planning) and the Department of Finance (for budget allocation) and the Ministry of Communications is necessary before any project can be implemented. Upon approval, Bappenas and Ministry of Communications would be responsible for monitoring these projects.

Coordination between the national and provincial levels are carried out through ad hoc steering committees of the agencies involved in the project (such as those at the local, provincial or municipal levels). Their proposals could be submitted directly to the Department of Communications or the Public Works Department directly or through their representative office at the region/provincial levels.

In Malaysia, the Economic Planning Unit (EPU) is responsible for overall macro-planning and like Bappenas in Indonesia, is responsible for ensuring that sectoral planning is integrated into the overall national planning. The plans of any sector have thus to be in line with the priorities as established in the national development plans. In Malaysia, the Ministry of Communications is responsible for formulation, evaluation and implementation of transport policies, development programmes and capital projects. The provision and maintenance of physical facilities come under the control of the Ministry of Works and Utilities and its two bureaus, namely, Highway Planning and Public Transport Unit (HP & PTU) and the Roads Section of the Public Works Department (PWD). The demarcation of responsibilities is quite clear-cut with the HP & PTU responsible for the planning and coordinating of federal road network development while the PWD is involved in the implementing of highway projects. The need for extensive collaboration between these two agencies need not be overstressed and this is even more apparent when we examine the relationship of these agencies and those at the state level. At the state (i.e., provincial) level, the planning and development of state roads fall under the jurisdiction of the state PWDs which is under the control of the federal PWD. Similarly, in the construction of federal highways, the state PWDs are sometimes delegated the responsibility of constructing those stretches that are within the respective state boundaries. It seems necessary that even though the HP & PTU is not directly in control of the state PWDs, the latter had to consult the former to ensure that proposed linkages at the state level would fit into overall federal transport system. Inter-agency coordination is further institutionalised through the Implementation, Coordination and Development Administration Unit (ICDAU) of the Prime Minister's Department which acts as a secretariat for the National Action Council (NAC). The NAC receives reports from agencies while the ICDAU assists in carrying out spot checks to ensure that project implementation is sufficiently coordinated. Steering committees are also set up on a need basis to ensure that agency interests are consulted in provision of specific linkages, be it the federal or state level.

In Phillippines, the major agencies are National Economic and Development Authority (NEDA), the Department of Public Works, Transport and Communications (DPWTC) and the Department of Public Highway (DPH). NEDA is responsible for overall development plans and coordination of inter-sectoral planning. The DPWTC is responsible for establishing a network of transportation facilities and integration of such facilities with other public works and communications systems. It discharges these roles such as planning, production, operation, regulation and maintenance of infrastructural facilities and services through specialised bureaus such as the Bureaus of Public Works and Land Transport. The DPH was a bureau in DPWTC until it was made a separate agency on par with the latter in 1968. This agency is assigned the specific tasks of planning, maintaining and regulating highways in the country and the studies on traffic flows.

In Singapore, the major agencies involved are Ministry of Finance (in charge of overall development plans and budget allocation), the Ministry of National Development and its bureaus, the Planning Department and Public Works Department, and the Ministry of Communication (overall regulation and implementation of communications policies).

In Thailand, the Ministry of Communications, through its bureau, the Department of Land Transportation, is responsible for formulating and implementing transport policies. The Ministry of Interior is also involved in provision of road infrastructure - a role which is strengthened by its control over the PWD (responsible for engineering services and roads to provinces and municipalities), the Department of Local Administration (responsible for funds to provincial administration and funds for road construction at provincial level) and the Office of Accelerated Rural Development (or ARD) which, previously under the charge of the Prime Minister, is involved in developmental activities as part of the overall counter-insurgency programme. In addition, the Ministry of Interior is responsible for town and country planning (through its Town and Country Planning Agency) and transportation systems of Bangkok (through its Expressway and Rapid Transit Authority). The Ministry of Finance affects road development with regard to revenue-generation and the Ministry of Defence, as a priority transport user, has a dominant influence on matters pertaining to infrastructural development. The latter too constructs minor roads, though ostensibly for military use or to improve local logistics. The Prime Minister's Office is involved largely through its National economic and Social Development Board (NESDB) which prepares developmental policies and the Budget Bureau. Overall coordination is ensured by the NESDB which coordinates plans and programmes both within and outside the control of the Ministry of Communication, although a Transport and Communications Committee

(TCC) was set up in 1973 and which involves all agencies which are users or providers of infrastructural facilities and services. This is also the only committee in charge of inter-modal coordination and elaborating the national transport policy in an inter-sectoral context.

The brief description of agencies in the ASEAN region points to several interesting generalisations. First, with the exception of Singapore, there are many tiers of government involved and a major administrative problem is to ensure that these layers of government and the agencies involved could function harmoniously. This is not always attained partly because of differences in extent of control, and powers to generate revenue, and partly because of differences in perceptions of needs at these various levels. In Thailand, for example, a major problem is to ensure an effective working relationship between the Ministry of Communications (in charge of the national network) and the Ministry of Interior (in charge of provincial administration and funds).

The description also shows the importance of a central planning agency. While the ambit of power and influence varies, it would seem that these planning agencies like Bappenas, EPU, NEDA, the Ministry of Finance in Singapore, and NESDB, have considerable influence on how transport development should be staged. Because of their control over inter-sectoral development, it would seem therefore that transport development should harmonise with other sectoral developments since it has, like other activities, to compete for support and thus for the necessary funds.

Thirdly, there seems to be a separation between agencies involved in project implementation and those in policy regulation. In Philippines, this became clearer when the Department of Public Highways was created. This separation, has been justified in many of the Asean countries on the premise that construction of all development projects (of which infrastructural development forms a part) should be undertaken by a specialised agency. On the other hand, this may compound problems in coordination and sharpen inter-agency conflicts. In Philippines, the creation of DPH on par with DPWTC, while ostensibly achieving greater specialisation in the road transport activities, "may have structurally added to coordination and integration problems in transport sector planning and implementation". [16] In Thailand, the Ministry of Interior has been traditionally a much stronger agency - more so by its control over public works, local administration, accelerated rural development programme, planning, and transportation in the Bangkok region. It is thus unlikely that such an agency would merely wit for the cue from the Ministry of Communications and is just as likely to stage its own programme and pace on matters pertaining to road and infrastructural development.

Finally, there is the tendency to resort to coordinating committees. [17] While this is a solution to matters involving multiple agencies, and could have positive uses by ensuring that plan formulation and implementation would take into account other agency interests - either as providers or users - such committees tend to blur lines of responsibility while powerful agencies would try to elbow other organisations into accepting their views. Also, it is a common observation that such committees invariably lengthen the time lag in policy formulation and implementation.

Administrative measures have been proposed in streamlining and improving the administrative processes in each of these countries in studies undertaken elsewhere on the subject. [18] Suffice it to say, administrative feasibility and political convenience and between administrative feasibility and deep seated personal and agency interests do not also coincide. Fundamental administrative changes have been proposed in some of these countries, but they were not accepted. In Singapore, the proposal for an Inland Transport Authority to encompasss all agencies involved in the regulation, enforcement, construction and planning of traffic management schemes - which would have the effect of setting up a single agency to replace the existing practice of having numerous agencies dealing on these matters on a fragmented basis - was not accepted by many of the existing agencies. A major factor in rejecting this proposal was the fear that such a super-agency may reduce or even deprive the existing agencies of their roles although the practical problems of demarcating the roles to be assumed by such an agency were also mentioned. [19] In Philippines, the Integrated Reorganisation Plan of 1972 recommended the creation of a Bureau of Transportation which would, just as in the Singapore proposal assume responsibilities pertaining to transport infrastructural activities as well as the regulation, development and control of land, sea and air transportation. [20] The sub-systems of the transport system such as infrastructure (roads, bridges, rail, ports), modes of transport (rail, road, sea, or airplanes), and regulation (licensing, tariffs, etc.), would come under one department. The proposal seeks to cut across the labyrinth of agencies and committees thus simplying and expediting decision-making with regard to overall infrastructure and national development plans. As expected, this proposal encountered vigorous resistance from many of the existing bureaus. Agency interests could prevail over arguments for administrative rationalisation.

Short of changes, administrative reforms had to focus largely on reducing possible areas of conflicts and on personnel strengthening. Personnel strengthening has been suggested as one of the remedies as many of the ASEAN countries are confronted with a shortage of trained and specialised manpower to carry out the various facets of road development programmes. Indeed, a tendency for projects to be "contracted" out to private construction companies in many of these countries indicate not so much a fervent commitment to the spirit of the pro-capitalist enterprise but because of the shortage of skilled manpower in the agencies in carrying out these projects. Consequently the private contractors are often more experienced and effective than the governmental agencies that from an cost-effective perspective, these contractors had to be extensively relied on for the construction of developmental projects. Project-implementing agencies have *de facto* been reduced to a monitoring role.

Other proposals call for unambiguous lines of authority and communication, the shortening of time-lag between formulation and implementation and effective monitoring of implementation progress are some areas that could be looked into, although, ironically, many of such proposals would simply have the effect of adding more agencies/committees to the already complex administrative scene. [21]

FUNDING AND URBAN TRANSPORATION

A major problem, apparent in the discussion on inter-agency relationship, involves the issue of funding. The national governments have to satisfy a wide range of social and other needs and they are increasingly called to fulfil these needs. Indeed, an underlying factor in the ambitious development plans of the region is the desire to maximise satisfaction of such needs through careful allocation of resources.

Road development is a costly exercise. Even though local materials and manpower could be tapped for road development, expensive equipments, and land (right-of-way acquisition) had to be bought. Foreign funding,

through technical assistance programme or borrowings, has been resorted to in specific road development projects or to top up funds resulting from policy commitments. Instances of such assistance would be the Friendship highway linking Saraburi to Korat in Thailand which was financed by the United States after an application to the World Bank bank was rejected in the early 1950s. This cost of this highway, stretching a distance of 310 kilometers, was US$15.6 million including right-of-way acquisition and construction or an average cost of $94,000 per kilometer. The loan from the Japanese government to the Philippines is another example of such assistance. This assisted project made possible a major transport infrastructure serving Luzon, Visayas and Mindanao, that is, a total length of 2,066 kilometers traversing 21 provinces and 11 major cities. From this highway, other secondary distributory linkages are constructed or made possible.

While foreign assistance would be useful and welcome, especially when it made possible purchases of equipment and materials, nonetheless there are various constraints in securing such funds. To begin with, the perceptions of needs (even when supplemented by feasibility and other cost studies) of the national government and those of the potential lenders may not coincide. The setting up of institutions like the Asian Development Bank could go a long way to securing cheap development funds, but the problem still persists. State-to-state lending, on the other hand, is influenced by other policy considerations especially the extent to which the proposed infrastructural developments would also secure the national interests of the lending countries. The willingness of the United States to participate in many highway construction projects in Southeast Asia in the 1960s was as much influenced by the extent to which such projects would help to promote better inter-state relationships between the United States and these countries and also the extent to which these assistance would improve logistics capabilities against communist insurgency. The major factors in deciding whether loans would be forthcoming would thus depend on the congruence of interests between the lending and borrowing countries and the leverage to which these countries would be able to exert on each other.

Ultimately, the national governments have to look to the domestic sources for funding. While revenue could come from other economic sectors (such as taxes from extractive activities), it is generally felt that users of facilities would have to pay for improvements to transport infrastructure. From points of political stability and social equity, the government could shift the incidence of the burden to selected user-groups while others such as the cyclists, the farmers using farm equipments, or the pedestrians would be exempted. The vehicle-users appear to be a major group of consumers made to pay. Toll practice is not widespread, being found only in isolated linkages where fees collected are generally used for infrastructural maintenance rather than for recoping of developmental costs. The acceptable approach has been to impose taxes on motorised vehicles and petroleum. This could take many forms from import taxes on vehicles to the annual "road" tax. The rates on these taxes would be varied accordingly to realize the funds required by the government after taking into account the incidence and impact of these taxes on economic activities.

The amounts realized can be substantial. In Singapore, it has been shown that the revenue collected through these sources exceeded annual expenditure on road development by wide margins. [22] Undoubtedly, the rates of taxes levied are also done with other implications, namely, as a deterrence to over-expansion of car-ownership. The Singapore case is interesting insofar as it illustrates the use of tax measures not merely for revenue-generation (welcome though this would be), but largely as a deterrent against ownership of cars. The over-riding factor is to prevent the city-state from suffering the slow strangulation resulting from a saturation of vehicles and inadequate room for mobility. V.P.D. (on many of the arterial roads in 1968) were reported to be 40,000. Apart from improving the public transport system, the taxes on cars and petroleum were periodically revised upwards to make car-operation in this city-state one of the costliest in the world. [23] Even then, the number of car-ownership tapers off rather than declining sharply. At the same time, an attempt at road pricing in the core areas of the city (the CBD) was attempted when fees were levied for vehicles seeking access to the CBD during morning peak hours. This arrangement (the Area Licensing Scheme or ALS) has the purpose of reducing car flow into the CBD. [24]

It would seem that enormous revenue could be realised from this form of domestic funding. These fiscal measures could also have the effect of ensuring a more orderly growth in car-ownership. To a great extent, the initiative will have to come from the political leadership which has to decide on which source of funds ought to be tapped and on whether it is willing to antagonise vested interest groups such as the road users. An attempt to impose road tax on cars on a sliding scale in Thailand, for example, resulted in vociferous denunication of the proposal.

On the other hand, it is clear that a major factor in car-ownership is its disproportionate concentration in urbanised areas, especially in the primate capital cities. It is true that the larger share of national wealth and tertiary activities are found in these citites - and hence the ability to pay for the vehicle-purchasing and maintenance - but the figures have been disquieting. An examination of the vehicle distribution in the ASEAN countries shows that more than half of the total vehicle population are concentrated in the capital cities. Thus, in Philippines, 58 per cent of the vehicles registration in 1973 was in Manila Bay region, as compared to the 13 percent in other parts of Luzon and Palawan, 14 percent in Visayas, 12 percent in Mindanao and 2 percent in the Bicol region. [25] In Malaysia, it is projected that by 1990, about 50 percent of the families in the metropolitan area of Kuala Lumpur will be car-owners. Translated into other terms, there were already 200 vehicles for every of the 192 kilometers of road in Kuala Lumpur in 1970 as compared to 39 vehicles per kilometer for the whole of peninsula Malaysia. If this car-kilometer ratio between Kuala Lumpur and the rest of the country were to be maintained, the city would require an additional 960 kilometers of roads to be constructed by 1990.

The problems of the primate cities are the large concentration of population and economic activities. In most instances, they have also attracted the bulk of the country's industrial activities. Mobility and accessibility in these cities are a premium, but these requirements have been hampered by many factors such as the inability of earlier city-planning designs to cope with the dimensions of the current problems, the rural-urban drift of people and the lack of other supporting facilities. In Jakarta, for example, basic utilities like electricity, water and sanitation have yet to cover all parts of the metropolis - the task of providing these services having been hampered by growing population and proliferating commercial/industrial activities. Daily trips in these cities exceeded the million mark and puts a considerable strain on existing transport modes and facilities.

Obviously, a solution to the transport problem (and

also, road development problem) in the capital cities is most urgent if economic activities are not to grind to a halt by the slowing down in mobility. Planning of transport development has to take into account a possible replanning of the cities, not just the often delapidated CBD but also the other industrial and commercial zones to ensure better use of land. Solution to congestion and traffic manoeuvrability cannot be adopted on a piecemeal basis (such as the construction of new roads) because of environmental constraints. It is thus not surprising that the replanning of the city areas has been initiated such as is occuring in Singapore or is currently been thought out in Manila. Hopefully, these new plans could provide for a more rational and effective use of land and other resources in the metropolitan areas.

At the same time it is increasingly clear to most policy-makers that a reduction of motor vehicle population is essential. This is done through construction of ring roads so that through-city traffic need not go through the city areas and thus reducing demand on city routes. In Singapore, as stated earlier, the Area Licensing Scheme is another regulative method to reduce traffic into the city areas through imposition of a fee. Governments are also made aware of the need to improve public transport such as rationalising the routes and tariffs or ensuring that public transport operators do have sufficient fleets. The unsatisfactory state of public transportation and the inevitable interest in public transport by the government (or the municipal authorities) invariably lead the authorities to a more extensive involvement on the operational issues of public transport.

The problem of urban transportation is thus a source of continuing concern. This can be seen from the number of reports or studies commissioned. [26] Most of these reports mentioned a series of proposals such as improved traffic management, reduction of through city traffic, curbs on car-ownership, and improvement of public transport. Each of these proposals, taking into account the complex urban administrative processes and the configuration of political support, would itself be a challenge. Yet, unless policy-initiative in these directions are made, the urban transportation problem is likely to be excerbated.

The other proposal which most of these expert-reports have generally recommended is the introduction of mass rapid transport system. [27] Unlike the other categories of proposals, the mass rapid transit system (MRT) requires a different approach to the urban transportation problem insofar as it called for the provision of right-of-way or grade segregation for selected transport mode, further investment in technology and equipment and a revival of the problem as to the extent of governmental involvement. Funding and recoping of investments on such a massive scale are likely to be major problems for the governmental authorities having to decide on whether such a system is essential. These decisions have to be made amidst other considerations such as the requirements of the rural and other less urbanised sectors, the availability of financing, and also, the need to prevent the urban sprawl in the primate cities from becoming unmanageable. Notwithstanding feasibility and other studies, any decision on whether to implement such a project or otherwise would ultimately have to be decided by the political leadership.

CONCLUSION

In this paper we try to examine the role of road infrastructure in the national development of ASEAN countries. This is largely an exploratory paper since studies on a comparitive basis of this region in this aspect have been neglected and much of the data necessary for a full-scale study are not available. Nonetheless, it has been shown that the national leadership in these countries are committed to formal development as a optimal approach to accelerating economic growth and improving the welfare of the people. There is a general acceptance of the importance of infrastructural development, notably with regard to road infrastructure. The belief in a correlation between provision of road infrastructure and economic growth and improvement in overall national welfare has been justified by the feedbacks to the government which indicate that visible social and economic changes do result from investments in road infrastructure.

There are many constraints or bottlenecks in the provision of road infrastructure. There are even more bottlenecks on the other issues of maintenance and regulation. The major constraints have been noted to include the complexity and cumbersomeness of the existing administrative processes, the question of fundings, and the problems peculiar to primate capital cities. For the national government, all these problems are not exclusive to the road infrastructure. As indicated in the paper, these issues relate to the wider questions of resource allocation, opportunity costs, development strategies, inherited administrative processes and skills - all of these in an environment of limited resources at the disposal of the national elites. Yet, unless positive response to these issues are forthcoming, the question of maximising the use of limited resources will remain only partially answered. For the national governments, this could mean a slower response to satisfying the demands of national development and could limit the potentialities of road infrastructure to satisfy national and community needs.

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[3] Louis Leferber, "Economic Development and Regional Growth", in Gary Fromm, ed., **Transport Investment and Economic Development** (Washington: Brookings Institution, 1965), p. 120.

[4] Some transport planners and economists feel that quantification is not an insurmountable obstacle. See, for example, Sei-Young Park, "Transportation and its role in socio-economic development", in ITC-UNESCO, **Seminar on Transportation Problems and Integrated Surveys** (Delft: ITC-UNESCO, 1968), especially pages 38-46.

[5] Local participation in both construction and maintenance of road facilities is possible. Such participation imparts experience in administration and greater inter-personal contacts. See G. W. Wilson, "Theory a Theory of Transport and Development", in G. W. Wilson, **et. al., The Impact of Highway Investment on Development** (Washington: Brookings Institution, 1966), pp. 190-218.

[6] **Indonesia Develops: Repelita II** (Jakarta: Department of Information, Indonesia, n.d.), p. 7.

[7] The total length of paved roads, for example, has increased from 10,208 kms. in 1966 to 15,540 in 1970 or 34.3 percent in 5 years. Also see Chapter 9 of **Four Year Development Plan, 1972-75** (Manila: National Economic Council, 1971) for details.

[8] Extracted from Table E-8, in **Southeast Asian Regional Transport Survey,** Vol. Three, Part Two (Manila: Asian Development Bank, 1972), p. 17.

[9] In Thailand, the policy in the 1960's was to construct all primary highways with base and sub-base layers to support a minimum load of 9,000 lbs. per single wheel. This figure has been raised to 12,000 lbs. in new design construction because frequent overloading contributed to rapid deterioration of roads built to lower standards. See D. K. Clark and A. C. Giarratana, **Transportation System of Thailand** (McLeen, Virginia: R. N. Corporation, 1966), p. 8.

[10] Erosion caused by floods and water logging is very common. See **ibid.,** pp. 13-14. Also see comments of **Evaluation**

of the First Six-Year Plan, 1961-66 (Bangkok: NEDB, 1967), Chapter 9.

[11] This survey carried out under the sponsorship of the Asian Development Bank, looks into highway development in Southeast Asia. The study was carried out by Arthur D. Little Inc., and Associated Consultants using materials and data supplied by countries included in the survey.

[12] See for example the National Transportation System Study made by the Department of Public Works, Transportation and Communications in collaboration with other related agencies.

[13] See for Example, Willian Hughes, "Social Benefits Through Improved Transport in Malaya", in E. T. Haefele, ed., **Transport and National Goals** (Washington: Brookings Institution, 1969), pp. 105-121; G. W. Wilson, *et. al.*, **op. cit.,** pp. 127-161; J. H. Jones, **Economic Benefits from Development Roads in Thailand** (Seato Graduate School of Engineering, Technical Note 15); Patrocinio S. Villanueva, **The Value of Rural Roads** (Manila: Community Development Research Council, 1968). Also see, G. Fromm, ed., **Transport Investment and Economic Development** (Washington: Brookings Institution, 1965).

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[15] See Hughes, **op. cit.**

[16] See, page 4 of G. U. Iglesias, *et. al.*, "Study of the Administration of Transport and Communications Projects, Plans, and Annual Budgets in the Philippines", in **Transport Planning Procedures** (Kuala Lumpur: ACDA, 1976).

[17] See the country-papers in **Transport Planning Procedures, ibid.,** for a description of the agencies and committees in the five Asean countries. In most instances, the list is staggering.

[18] See the country-papers in the **Transport Planning Procedures.** The respective writers for the country reports are M. Siregar (Indonesia); Abdul Halim bin Datuk Haji Abdul Rauf (Malaysia); G. U. Iglesias, J. B. Evidente, Jose R. Valdacanas and E. T. Gumayan (Philippines); Seah Chee-Meow (Singapore); and Pharani Kirtiputra (Thailand).

[19] See Chia Lin Sien, *et. al.*, **Organisation and Financing of Domestic Transportation in Singapore** (Kuala Lumpur: ACDA: 1976), p. 38.

[20] Iglesias, **op. cit.,** p. 70.

[21] Reforms that have a high degree of acceptance generally do not affect the core interests of certain competing agencies. These are likely to be in the form of more coordinating committees which would over-stretch the time and energy of the bureaucrats.

[22] Revenue from import duties, petroleum tax and fees collected by Registry of Vehicle has increased from $59 m. in 1969 to $134 m. in 1973. Expenditure has not matched revenue. Development expenditure in 1973 amounted to $29 m.

[23] For a detailed discussion of these rates see, Chia Lin Sien, *et. al.*, **op. cit.**

[24] See Tan Kee Tiang, **The Area Licensing Scheme in Singapore** (Academic Exercise, University of Singapore, 1975).

[25] **Philippine National Transportation Survey, op. cit.,** p. 4.

[26] For example, the studies on Singapore Mass Transit Study by Wilbur-Smith and Associates, Bangkok Transportation Study by the German Team of Experts, and the Urban Transport Policy and Planning Study for Metropolitan Kuala Lumpur by Wilbur Smith and Associates. Many of these studies are carried out with the financial assistance of international agencies such as the World Bank.

[27] Specific agencies, as in the case of the Singapore Mass Transit Planning Unit, could be set up to examine the issues specific to the implementation of rapid transit systems.