

PRESENT SITUATION AND ISSUES ON LANDUSE AND TRANSPORTATION
IN BANGKOK METROPOLITAN AREA

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The experience in urban development and transportation in Bangkok Metropolitan Area over the past two decades indicates some deficiencies in planning and implementation. The city has encountered a variety of serious difficulties to translate plans and policies into operational programs and investments in spite of the dramatic economic development. The magnitude and seriousness of the problems encountered suggests that alternatives approaches for existing planning and implementation system be tested and evaluated. The objectives of this study are to investigate the present situation of transportation planning in relation to landuse planning and to identify issues at different stages of planning and plan implementation pertaining to landuse and transportation in Bangkok Metropolitan Area. The paper starts with a brief review of the present situation of urban development and transportation system in Bangkok and followed by a discussion on the current issues of planning and plan implementation regarding landuse and transportation.

1. Present Situation of Landuse and Transportation in Bangkok

1.1 Urban Problems

The rapid urbanization of Bangkok Metropolitan Area during the past decades have created urban problems of enormous proportion. The urban problems of Bangkok might be represented by excessive agglomeration of economic activities, traffic congestion, disordered development of landuse, environmental pollutions and safety problems, which are described in Table 1. Furthermore, other problems such as land subsidence, flooding, garbage and water resource are emerging and increasing seriously.

1.2 Landuse

The spatial pattern of development in Bangkok has been determined to a large extent along transportation corridors. The recent development pattern is characterized by large portions of land being held idle, particularly in the middle and outer rings of the city. The fragmented pattern of land ownership has made it more difficult to assemble tracts for development. The pattern of uneven development is further exacerbated by property tax and state enterprise land policies. Low property tax remove one potentially valuable incentive for land development which is allowing land owners to sit on idle land and thus imposing additional burdens on their neighbors while paying little of the cost. Effective land policies is therefore needed to follow up the problems.

The present urban development is being represented by the rush in construction of office buildings, hotels and condominiums in and around the Central Business District (CBD) area, and supermarkets and department stores in the fringe area. This has resulted to an increase in the density of built-up area and a reshaping of the urban structure of Bangkok. Due to high land prices, residential development tends to move outward the city center while the tertiary industry is likely to be located in the CBD.

1.3 Transportation

The Bangkok traffic congestion is well known as one of the worst in the world. Although transportation problems are similar in nature to other developing metropolises, they may not be of the same in magnitude. Some characteristics of the problems include traffic congestion, air and noise pollution caused by road traffic, a large number of accidents especially to pedestrian, cyclist and motorcycle and so on. The main causes of the problems could be seen from an inefficient road network, inadequate public transportation, shortage of parking space, and neglect of pedestrians and cyclists. The performance of existing transportation system in Bangkok indicates a serious condition as described in Table 2.

1.4 Environment

An emerging issue accompanying transportation problems in Bangkok is the environmental damage caused by traffic. It is apparent that there are severe problems of air pollution in several areas of Bangkok. The data from National Environmental Board (NEB) shows that carbon monoxide and lead do not constitute a serious problem but

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the level of suspended particulate matter is generally high, yet this doesn't seem to represent the actual situation. From the same source, a continuous measurement of noise level at 14 stations along the roads in Bangkok indicates noise problems for many miles of the road close to heavy traffic. From the data at least 5 stations have noise levels in excess of 80 dBA and the rest in excess of 75 dBA as compared to the standard of 70 dBA. In addition, visual impact due to an increase high-rise buildings and elevated roads have given some areas of the city a sense of enclosure. The major roads have severe effects on some communities and often act as a physical barrier to movement either due to the number of lanes that need to be crossed, the high traffic volumes and the presence of a median divider. Other important issues arising recently are :

- (1) NEB noise and air quality standard are more lenient than US and EC standards,
- (2) black smoke from diesel engines continues to be a problem and vehicle inspection are not effective,
- (3) emission from motorcycles are a growing problem,
- (4) vehicle noise is high, particularly

from motorcycle and tuk-tuk (local cars), (5) enforcement of vehicle emission standards need to be strengthen, (6) the pedestrian environment is poor, (7) environmental issues need to be fully integrated into project design.

2. Planning and Implementation

2.1. Landuse Planning

Starting with Litchfield Plan in 1960, several master plans for Bangkok have been made and revised many times. However, very small part of the plan has been implemented because of lack of legislative support. It was only used as the basic guidelines for the government agencies in metropolitan development.

The current structural plan for Bangkok has been formulated by the Department of Town and Country Planning (DTCP) and submitted to the government for approval in 1983. The plan considers the target year of 2000 and is aimed mainly at defining plans for landuse and communications in the metropolitan area. But so far, there has been little

Table 1 Urban Problems of Bangkok

General Problem	Specific problem
(1)Excessive agglomeration of economic activities	migration due to job opportunities and higher income
(2)Transportation	inadequate public utilities, housing shortage
(3)Landuse development	traffic congestion, poor public transport service, inefficient road network
(4)Environment	disordered development of buildings, extensive slum housing, inefficient use of land
(5)Safety	air & noise pollution, water pollution
(6)Others	traffic accident
	garbage, flood, water resource, subsidence

Table 2 Transport Situation in Bangkok

Some Transport Performance Indicators	
1.road network performance	.serious congestion in city center, especially in peak hours with traffic speed of 11-13 kph
2.public transport service -buses	.no segregated public transport system .low travel time with average bus speed of 13 and 18 kph in peak and off-peak hours. .low level of bus service, crowded, unreliable, uncomfortable, etc.
3.environmental degradation	.air pollution with high level of SPM .serious noise level alongside major roads exceeding 75 dBA
4.safety	.dramatically increased traffic accidents i.e. 14,092 in 1985 to 31,175 in 1988 (no. of accidents recorded by police)

possibility of making such plans effective. The plan is still in the various stages of the approval process and thus do not have current legal effect. The procedure for approval of these plans are complex and time consuming.

In mid 1990 the DTCP published its new landuse plan for the Bangkok Metropolitan Area and is hoping to obtain legislation to strengthen its power of implementation. However, up to the present time there is still no issuance of a ministerial regulation enforcing the Bangkok Metropolitan Plan. We may not know how successful this effort will be and how much influence it will have in the development of the Metropolis.

2.2 Development Control

The Structural Metropolitan Plan should be used as a guideline for landuse development and control, i.e. zoning enforcement, as well as transportation infrastructure provision. However, as the plan is still in the process of approval, the Bangkok Metropolitan Administration (BMA) has been using the Building Control Act of 1979 as a tool to control the landuse development. The measures used in landuse control are mainly zoning control in terms of building height control, building type control, and building use control. However, these measures are limited only for some specific type of landuse and areas which has resulted in a mixed landuse and haphazard growth in some areas of Bangkok. Inadequate landuse control is one of the reasons why the transportation system has failed to play an important role as directive for urban landuse development. In addition, uncontrolled development of landuse, especially the increase in high-rise buildings in city center, have placed heavy demand for transportation services. Therefore, without definite transportation policy, the transportation investment programs are attracted to concentrate in the inner area of Bangkok to serve the demand.

2.3 Transportation Planning

The development of transportation infrastructure in Bangkok has been following the policies and guidelines of the five-year National Economic and Social Development Plan. From the experience during the past years, only the Sixth Plan (1986-1991) contains a serious plan to resolve the transportation problems of Bangkok. In addition to the five-year plans, there were other transportation plans such as the Bangkok Transportation Study which

provided a comprehensive long-term transport plan, Short Term Transport Review (STTR) and the Seventh Plan Urban and Regional Transport (SPURT), which proposed broadly the same approach as the former plan.

The experience and understanding of the transportation problem in Bangkok over the past 20 years have acquired a much greater consensus in professional transportation planners. As a result, when confronted with the problems of Bangkok most impartial transportation planners will come with the same conclusions, which are clearly stated in the STTR and SPURT. Therefore, the transport strategy for the Seventh Plan (1992-1996) follows the same line as the earlier studies. The strategy may be summarized in the following guidelines: (1) use existing road capacity more effectively, (2) take steps to reduce demand for road space, (3) create new road capacity (where the cost can be justified), (4) improve the quality of public transportation, (5) give priority of road to buses, (6) build a segregated public transportation system as soon as possible, and (7) set program of progressive improvements in environmental standards and impose necessary control to achieve them.

2.4 Transportation implementation

The Sixth plan period is not yet over but one can see clearly what is likely and not likely to be achieved. The achievement of the investment program has been better than that of the policy proposal, and some agencies have kept closer to the plan than others have. Most of the planned non-highway investment have also materialized. However, the policy requirements in the Sixth Plan have been almost wholly disregarded. Although the First Stage Expressway and other numerous big roads were built, the start of construction for the Second Stage Expressway was seriously delayed and little has been done to implement the other vital elements of the plan. Many other proposed roads have not been commenced and there is uncertainty with the contract for the mass transit system. In addition nothing has been done to introduce busways, nor to restraint traffic and little has been done to rectify the lack of distributor roads, or to reform the bus industry and raise the quality of bus service.

SPURT has identified the reasons why the transportation plans are not often implemented. There appears to be four main reasons (1) lack of technical capacity (2) difficulties in acquiring

land (3) complexity of bidding procedure and (4) the lack of finance. However, most of the failures in the past were not due solely to the technical difficulties but they were due, at least in part, to the lack of will on the part of the agencies. This could be attributed to a lack of common purpose, signifying that the objectives of the agencies were not compatible with those of the plan. This is an institutional problem, which will be discussed in the next section.

2.5 Institution Issues

There are 37 official agencies and four statutory committees responsible in urban transportation in Bangkok. In addition, a number of ad hoc committees have also been created. The main agencies involved in the landuse-transportation planning and implementation are presented in Table 3. The NESDB acts as the national coordinating agency for policy making. The project planning and operation activities are mainly carried out by the agencies and public enterprises of the Ministry of Interior and Ministry of Transportation and Communication. The local governments prepare the detailed action plan and become the core agency in project's implementation.

The failure of implementing the transportation system in Bangkok are as much due to institutional deficiencies as to the lack of material resources. The main problem, however, is not on the number of agencies but on their individual objectives and the way they are controlled. A conflict arises between the requirements of good transportation planning in other hand, and the capabilities and interests of the agencies, on the other. The conflict is due partly to the difference of opinion about transportation policy and much more to the institutional pressures on agency officials. The main problem seems not to lie with individuals who make the decisions but with the institutional structure in which they work.

Some issues related to institutional problems in the transportation sector are: (1) lack of agreed policies and plans, (2) prolonged decision making, (3) complex and inflexible procedures, (4) gap between project and financial planning, (5) land acquisition difficulties, and (6) lack of suitably trained and experienced staff.

3. Requirements for Realizing Integrated Landuse-Transportation Planning and Implementation

3.1 Requirements

It is clearly apparent that landuse planning and transportation planning in Bangkok are regarded as separate activities. There is a small link between them at the stages of both planning and implementation. The problems related to interactions between landuse and transportation as well as between planning and implementation are generally described in Miyamoto (1991). The experience from the past development in Bangkok has pointed out that the problems are categorized in the four areas of (1) physical constraint; (2) financial constraint; (3) technology constraint and (4) institutional constraint. The integrated way of landuse and transportation in the stages of both planning and implementation process is necessary but not easy to realize.

The authors consider that the institutional framework is much more important for realizing integrated landuse and transportation planning in Bangkok. The effective institutional framework can provide unique or common consensus of landuse and transportation plan to agencies concerned. The requirements for this effort should comprise of: (1) the development of planning tool for integrated landuse and transportation planning which is appropriate to the situation of Bangkok; and (2) the strengthening of institutional framework.

The planning tool for Bangkok, i.e. integrated landuse and transportation planning models, if accepted by agencies concerned, will provide effective solution for planners or decision makers to put the plans into implementing program. The development of this sort of planning tool have been discussed in Miyamoto (1990) and Ratchapolsitte (1989).

3.2 Institutional Set-up

The institutional problems are not unique to Bangkok, on the contrary, they have been found in every large cities of the world. Among the various proposals, there are two models which suggest a reshape of the institutional framework of Bangkok which are applicable for realizing integrated landuse and transportation planning: (1) set-up single authority such as metropolitan development authority, and (2) strengthen capabilities and the role of the local institution.

Many cities have created a single authority to be in charge of the strategic planning and development of

Table 3 Main agencies concerning urban landuse and transportation of Bangkok

Agency ----->		Central government				Local gov.	State Enterprise		Private
Type of involvement		OPM	MOI	MOTC	MOF	MOI	MOI	MOTC	sect.
LANDUSE									
P L A N N I N G	.National plan	NESDB							
	.General plan		DTCP						
	.Specific plan		DTCP			BMA			
	.Planning law and regulation		DTCP			BMA			
	.Financial allocation				BB	BMA			P.E
I M P L E M E N T A T I O N	.Land management		DOL						
	.Provision of public structure & utilities		DPW			BMA			P.E
	.Provision of housing						NHA		P.E
	.Building construction control		DPW			BMA			
	.Land acquisition		DPW DTCP			BMA			
EVALUATION ----->		NESDB	DTCP			BMA			
TRANSPORT									
P L A N N I N G	.National plan	NESDB							
	.General plan		OCMRT DTC OCMRT						
	.Specific plan		PD	DLT		BMA			
	.Regulations					BMA			
	.Financial allocation				BB	BMA			P.E
I M P L E M E N T A T I O N	.Provision of roads								
	-National								
	-Provincial								
	-Municipal								
	-expressway		DPW	DOH		BMA	ETA		P.E P.E P.E
	.Provision of transport terminals			DLT					P.E
	.Provision of public tran.								
	-bus								
	-mass rapid transit						ETA		P.E P.E P.E
	-rail transport							BMTA	
	-water transport							SRT HD	
	.Traffic management		OCMRT PD			BMA			
EVALUATION ----->		NESDB				BMA			

ABBREVIATIONS		BB = Budget Bureau	ETA = Expres. Transit Authority
MINISTRY	MOI = M. of Interior	BMA = Bangkok Metropolitan Administration	HD = Harbour Dept.
	MOTC = M. of Transport & Communication	BMTA = Bangkok Mass Transit Authority	OCMRT = Off. of Committee for Management of Road Traff.
MOF = M. of Finance	DLT = Dept. of Land Transport	NESDB = National Economic and Social Development Board	NHA = Natl. Housing Authority
OPM = Office of Prime Minister	DOH = Dept. of Highway		PD = Police Dept.
	DPW = Dept. of Public Works		SRT = State Railway of Thailand
	DTCP = Dept. Of Town and Country planning		P.E = Private Enterprise

landuse and transportation. The main reason is that the landuse and transportation infrastructure should be planned as a single system for the whole metropolis, not each part planned independently. The need for this solution is to find a form such an authority that can be fitted into Bangkok's administrative system with minimal disruption and conflict. Several options has been elaborated in SPURT.

The other alternative is to strengthen the role of the local institution, BMA, and its capabilities. Since BMA is the only institution which is involved in landuse and transportation at both stages of planning and plan implementation as shown in Table 3, it should play a much more important role in planning and managing the city's development system. This approach can minimize the coordination of activities among agencies which is the source of the major problem of institutional deficiencies. The local institutional problems such as financial constraints, legislative framework and lack of technology and training should be solved to strengthen its capabilities.

4. Concluding Remarks

The present situation of landuse in Bangkok is represented by an uncontrolled development arising from ineffective control and land policies. Landuse master plan could not be implemented effectively due to the lack of legislative support. The transportation situation in Bangkok is becoming the worst in the world. There is a considerable disparity between the intentions of the Sixth Plan and the reality that has been unfolded. Traffic congestion is remarkably worse, the condition of public transportation has generally deteriorated and the environment has not improved. Had the plans been implemented, there would still be problems, but the situation would be much better than it is at present.

In attempting to implement landuse and transportation plans, Bangkok encountered a variety of serious difficulties. The failure to implement transportation plans could be attributed to factors which are still present such as the lack of technical capacity, the difficulties in acquiring land, the bidding procedure and the lack of financial resources. Moreover, the failure of implementing transportation systems are as much due to institutional deficiencies.

Integrating landuse and transportation

planning and implementation is an alternative approach to improve the landuse and transportation problems in Bangkok. The proposed framework for realizing integrated landuse and transportation planning have placed the emphasis on two efforts, namely (a) by providing planning tools for the integrated landuse-transportation, and (b) by strengthening the institutional framework. The former is concerned with the development of integrated landuse and transportation planning model which is appropriate to the condition of Bangkok. The latter focuses on the institutional approach to strengthen the existing institutions capabilities for realizing the integrated plan. Two models are proposed, (a) the first is to set-up a single authority responsible for strategic planning and development of landuse and transportation, e.g. metropolitan authority and (b) the second is to strengthen the role and capacity of the local institution.

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