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Tokyo - Kyoto, Japan

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At the 7th International Conference on Operations Research, I was engaged as a chairman of the Urban Planning Workshop. Thus in what follows, I will report only on the activities related to the Workshop, but not to the whole conference. There were two interrelated forms of activities, a field trip to the Tokyo Metropolitan Government and the Workshop itself, both having clearly visible ad hoc features in their organization.

I. Summary of the Urban Planning Field Trip

The trip attracted 26 participants from six countries (Japan, USA, USSR, UK, India, Indonesia). The field trip presentation was made by two representatives of the Planning Department of the Tokyo Metropolitan Government (Mr. T. Okamoto and Mr. K. Horie), as well as Dr. S. Ito, who is the professor of the Tokyo University. The discussion topics may be conventionally classified into three basic groups:

1. Description of the current situation in Tokyo as related to population processes, housing and transportation systems, and characterization of the Tokyo medium-term plan.

2. Discussion of the solution for the specific problems (garbage transportation and processing pollution problems, transportation networks, earthquakes).

3. Discussion of planning methodology.

There was no proper balance among these topics and an evident overemphasis was made on the discription of physical problems.

1. Current Situation in Tokyo

According to the 1970 national census, the population decreased in 20 prefectures of Japan, while it increased in 26 other prefectures. This results in a labor force shortage in some places and overpopulation in such cities as Tokyo, Kyoto, Nagoya.

The population of the Tokyo Metropolitan region increased by 3.08 million in five years between 1965 and 1970, in spite of the out-migration which is growing. The radius of Tokyo is 60 - 70 km. Tokyo concentrates more than 50% of activities in such important areas as economics, banking, wholesaling, culture, education, etc. The daytime population in Tokyo is about 13 million and it is expected to grow up to 15 million in 1980.

The National Capital Region Development Law was enacted in 1956 but Tokyo has continued to spread outward. To restrict growth, the law was revised in 1965 and the concept of the green belt was incorporated. The plan for the development of suburban areas has been set which suggests arranging 18 satellite cities so as to smoothly introduce industries and manage distribution of population. The plan for development of the Tokyo capital region (Tokyo plus seven prefectures) envisions launching large-scale projects, such as expressways, express trains, rebuilding of housing, new towns, etc.

One of the basic planning principles is land use zoning, which submits several areas with restricted urban development processes.

There is an urbanization promotion area and urbanization control area where no development is allowed.

Building height control districts are introduced with the purpose of providing not only enough sunshine, ventilation and lighting, but also to improve the general living environment.

Building bulk control districts are to ensure adequate urban space by limiting the ratio of total floor space of the building to its site area.

Fire-proof and quasi-fire-proof districts are to introduce fire-resistant structures as a collective anti-disaster measure.

A special inspection is set up to cope with the earthquake disasters and to prevent them.

To cope with problems of overpopulation, transportation and housing, extensive rebuilding projects are under way. For example, such centers as Shinjuku and Ikebukuro were readjusted. This helps to rearrange the structure of Tokyo from a one nucleus to multi-nuclei and alleviate excessive concentration of population in the center. Other examples are the Koto Delta District and Tama New Town. Tama New Town, with a population of about 400,000 people, illustrates a population deconcentration measure.

Although the transportation system of Tokyo is continuously improving, the traffic problem is still far from the final solution.

A very good system of circular and arterial roads is now available. It is planned to introduce 12 routes of expressways with a total length of 171 km (eight routes are currently in use). An underground railway will have 11 lines with a total length of 287 km (eight lines with a length of 164 km are in operation).

There are about 2.5 million vehicles in Tokyo now. This results in many accidents, noise and air pollution. To cope with these problems, special measures are taken to isolate roads from housing (setting protecting walls, underground tunnels, etc.). To reduce the number of accidents and to eliminate traffic congestion, a computer control

traffic network will be arranged, hopefully by 1985. Negative effects of transportation systems result in debates about limiting road construction in Tokyo.

Due to the absence of an efficient land use strategy, the housing problem became more and more serious in Tokyo. The Municipal Government sees a solution in the simultaneous development of housing and land use policies. Some steps in this direction are being undertaken.

2. Solutions of Specific Problems

We were presented with several examples of approaches to solutions of specific problems. The participants were impressed by the large-scale rebuilding programs implemented as anti-earthquake protection measures and new building designs with anti-earthquake facilities.

The history of road construction in Tokyo illustrated difficulties which may arise due to the application of a non-systematic approach. At the stage of planning of a road network, no one expected the growth of the Tokyo port to produce a significant effect on the network. After this occurred, urban planners and the metropolitan government met an almost unresolvable problem of rearranging some roads and introducing new ones. They not only have technological difficulties in planning and accomplishing new road construction, but also difficulties in matching public opinions.

Very illustrative in terms of the power of public opinion was an approach to garbage transportation and processing. Although it is not required by economic and technological considerations, the garbage processing plants were set up one in each of the Tokyo wards as a result of pressure group activities. The same activities resulted in the construction of very expensive underground tunnels to remove garbage carrying cars from some roads.

3. Planning Methodology in the Tokyo Metropolitan Government

The Tokyo metropolitan government has a highly centralized hierarchical planning system: governor, deputy governors, departments. The finance department has a special position in terms of its influence on other departments. There is no rigorous methodology of planning. The plans of all departments are independent, so that there are no horizontal links among departments. The budget is distributed on a proportional basis plus some increment for growth. There are no operation research models at the highest level of decision making in the metropolitan government, however they are widely used at the level of subsystems, e.g. public transportation.

The following conclusions may be drawn from analyzing results of the field trip:

The Tokyo example illustrates very well the variety of urban problems and shows how serious some of them may be (distribution of population, housing, transportation).

Difficulties of planning arise due mainly to three factors:

1. complexity of the system under study;
2. human factors;
3. lack of system approach to problem solutions.

System complexity makes it difficult to evaluate the consequences of decisions. For example, satellite cities were initially planned as a means for population deconcentration and for unloading the center. The initial housing price was low, but it rapidly grew as these cities did not have enough money for their development in the form of taxes, as there was, initially, no industry planned. Thus industry started to move from the Tokyo center into the

satellite cities. This solved one part of the problem, but regenerated the old problems of population overconcentration, transportation, pollution, etc.

Human factors contributed a great deal to the difficulties of planning and the implementing of plans. Public debates about planned activities sometimes continue for several years reducing the actuality of plans and promoting solutions which often reflect the interests of pressure groups, not of the community as a whole.

Due to the lack of a system approach to urban problems' solutions, the plans and activities of governmental departments are not matched when dealing with clearly interconnected problems. Partial solutions found by separate departments do not often meet the requirements of others and this results in wasting efforts and moneys. The unexpected strong influence of the Tokyo port on road networks is a good illustration of the absence of a system approach. The importance of developing a system approach to urban problems was stressed. These would allow the treatment of a whole set of interrelated problems over a whole set of planning stages starting from the formulation of goals and passing through evaluating the attainability of goals, generating alternative strategies, choosing optimal or rational strategies, implementing and correcting plans to achieve the best attainments of the goals.

Under the influence of the field trip discussion, an integrated methodology for urban planning became the main topic of the subsequent workshop.

II. A Summary of the Urban Planning Workshop

The workshop was carried out in an atmosphere of informal discussions. The common feeling was that the hours allotted to it were clearly insufficient to cover all issues related to the general topic of the integrated urban planning. There were two sessions of the workshop. One

attracted 15 participants and another--10 participants from six countries: Japan, UK, USA, USSR, Canada, Indonesia. Three background papers appeared spontaneously and they contributed very much to structuring the discussion.

An integrated planning approach for urban management was suggested by Dr. Yasuda (Japan) which interrelated the micro and macro levels of management. It was based on systems dynamics principles and assumed close interaction between the decision-maker and a model in process of making decisions. The basic information sources for a macro-model are statistical data, whereas for the micro-model information is obtained through questionnaires.

It was noticed that implementation of the model may meet serious difficulties as it is a contrast to the existing system of urban management in Japan.

Discussion of integrated planning revealed very important problems of goal setting. It was stressed that the process of goal setting is closely related to human activity and is highly dynamic in its nature.

However strange it may seem but no more elegant solutions of goal setting problems than Delphy were found. I suspect that this may be the result of direct influence of the personality of Norman Dalkey who made very good contributions to the workshop, both by presenting the background paper on the Los Angeles experiment concerned with urban goal setting and by active participation in discussions. Many discussants underlined clearly positive results of applying Delphy not only to urban problems but to other types of problems as well, e.g. technological assessment. Beside Delphy, a single-expert approach and gaming simulation approach were discussed as prospective instruments for urban decision making.

An interesting practical approach to goal setting for urban planning was presented by Dr. Yen (Canada). He

suggested a so-called community approach which is based on intentional biasing of goals weights in the direction of the people's interests. A project for restructuring urban management in the city of Winnipeg was presented.

Several discussants expressed the necessity for closer interaction of urban managers and operation research specialists. They argued that this may result not only in better models, but in narrowing gaps between the design and implementation stages.

The latter problem was discussed using the relation of decision making and supporting data base as an example. Prof. N. Dalkey described a very illustrative case where a comprehensive urban data base was helpless in formulating answers to questions set up by practical decision makers, although it appeared very efficient by the judgements of operation research specialists.

The feasibility of a general purpose data base structure for urban planning and management was under discussion. Participants exemplified several case studies showing a strong effect of specific national approaches to planning which should be reflected in a structure of the data base. IIASA initiative in arranging comparative studies of urban systems at the cross-national level gained positive responses and was supported by participants.

The following conclusions may be drawn from the workshop sessions. Although formal and formalized approaches to urban planning develop in many countries, there is evident lack of integrated planning methodology which is able to cope with the whole variety of urban problems. Such a methodology may be developed through collecting and generalizing urban planning experience accumulated in different countries. First steps are being taken now in this direction, such as international urban planning workshops and collaborative studies (IIASA Urban Project activity being an example).

To gain more from urban planning activities, a cooperation of operation research people with a staff of urban and regional governments should be considerably extended. Finally, developing countries should pay more attention to negative consequences of partial (non-systematic) solutions of urban problems in developed countries and use this information to improve the situation in their cities more efficiently. As we learned from informal discussions during the workshop such an attitude, however slowly, is being set up in people's minds in some of the countries, e.g. Indonesia, where considerable attention is paid now to system planning in Jakarta.
