

A PROPOSED PLANNING PROGRAM FOR TOURISM
DEVELOPMENT IN HENGCHUN PENINSULA OF TAIWAN

by

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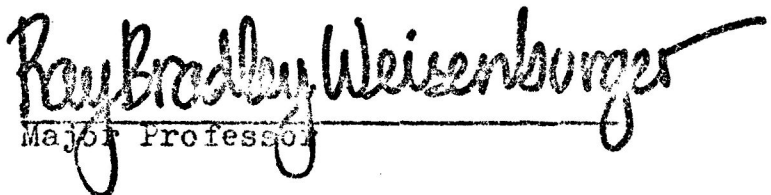

Major Professor

TABLE OF CONTENTS

	Page
INTRODUCTION TO THE STUDY	1
CHAPTER I INTERNATIONAL TOURISM AND TOURISM DEMAND POTENTIAL IN TAIWAN	4
A. Significance of International Tourism ..	4
B. Tourism Demand Potential in Taiwan	6
1. International Tourism	6
2. Domestic Tourism	12
3. Government Policies	13
CHAPTER II TOURISM SUPPLY POTENTIAL AND HENGCHUN PENINSULA OF TAIWAN	18
A. Tourism Supply Potential Areas in Taiwan	18
B. Significance of Hengchun Peninsula to Promote Tourism Development in Taiwan ..	20
1. Location and Size	20
2. Tourism Potential	21
3. Feasibility of Development	23
CHAPTER III PREPARATION OF PROPOSED PROGRAM FOR HENGCHUN PENINSULA TOURISM DEVELOPMENT	26
A. Scope of Planning Program	26
B. Proposed Planning Goals	27
C. Proposed Philosophy and Principle in Tourism Development	27
D. Planning Process	29
CHAPTER IV WORK ANALYSIS AND ORGANIZATION OF PLANNING PROGRAM IN HENGCHUN PENINSULA TOURISM DEVELOPMENT	32
A. Work Analysis in Planning Process	33
B. Organization of Planning Program	45
1. Total Work Scope	47
2. Time Period Designated	48
3. Personnel Arrangement	48
4. Fiscal Condition Analysis	50

TABLE OF CONTENTS (CON'T)

	Page
CHAPTER V	
NETWORK DIAGRAM FORMULATION AND RECOMMENDED MANAGEMENT	52
A. Methodology of Network Diagram Formulation	52
B. Formulation of Program Network Diagram	54
C. Network Diagram Management	56
CONCLUDING REMARKS	58
APPENDICES	
APPENDIX-A Definition of Tourist	60
APPENDIX-B YIN and YANG Philosophy	61
APPENDIX-C Factors Affecting The Growth and Demand of Tourism/Recreation.	64
APPENDIX-D Introduction of CPM management and Mathematical Equation Formulation	66
APPENDIX-E Computer Calculation of CPM on Program Network Diagram	68
SELECTED BIBLIOGRAPHY	77

LIST OF FIGURES

	Page
FIGURE-1	Total Study Scope Diagram 3
FIGURE-2	Geographic Location of Taiwan in Far East 8
FIGURE-3	Projection on Number of Tourist in Taiwan 11
FIGURE-4	Location of Scenic Areas in Taiwan 15
FIGURE-5	Transportation Networks in Taiwan 17
FIGURE-6	Major Tourism Regions and Tourism Flow in Taiwan 19
FIGURE-7	Hengchun Peninsula in Southern Tourism Region of Taiwan 22
FIGURE-8	Topographic Condition of Project Area in Hengchun Peninsula 24
FIGURE-9	Man-made Condition of Project Area in Hengchun Peninsula 25
FIGURE-10	Total Planning Process and Project Plan Formulation Process Diagram 30
FIGURE-11	Tourism Area, Zone-attraction and Potential Market Area Relationship 37
FIGURE-12	Proximity and Accessibility Concepts 38
FIGURE-13	Organization of Planning Program 46
FIGURE-14	Formulation of Program 51
FIGURE-15	Total Planning Program Network Diagram 55
FIGURE-16	Balance Philosophy Graphic Indication 63
FIGURE-17	CPM Mathematic Formulation 67

LIST OF TABLES

	Page
TABLE-1	Tourist Growth in The Pacific Area 10
TABLE-2	Number of Tourist in Taiwan (1961-1971) 10
TABLE-3	Number of Visitor in Several Scenic Areas with Statistical Data Available in Taiwan 14
TABLE-4	Socio-economic Characteristics Relevant to Participation in Recreation/Tourism 65

INTRODUCTION TO THE STUDY

This study is going to prepare an intensive and comprehensive planning program for formulating the tourism development plan in Hengchun Peninsula of Taiwan. This report is not a development plan but rather an outline of how to prepare the work involved in the project. The purpose of this study would be: (1) to acquaint the people who are not fully familiar with all that of tourism development planning with regard to the optimum planning approach, philosophy and methodology which would be adopted for such kind of project; (2) to provide a broad framework for the persons who work on this kind of project to successfully carry out the job within the designated time period yielding the best possible results.

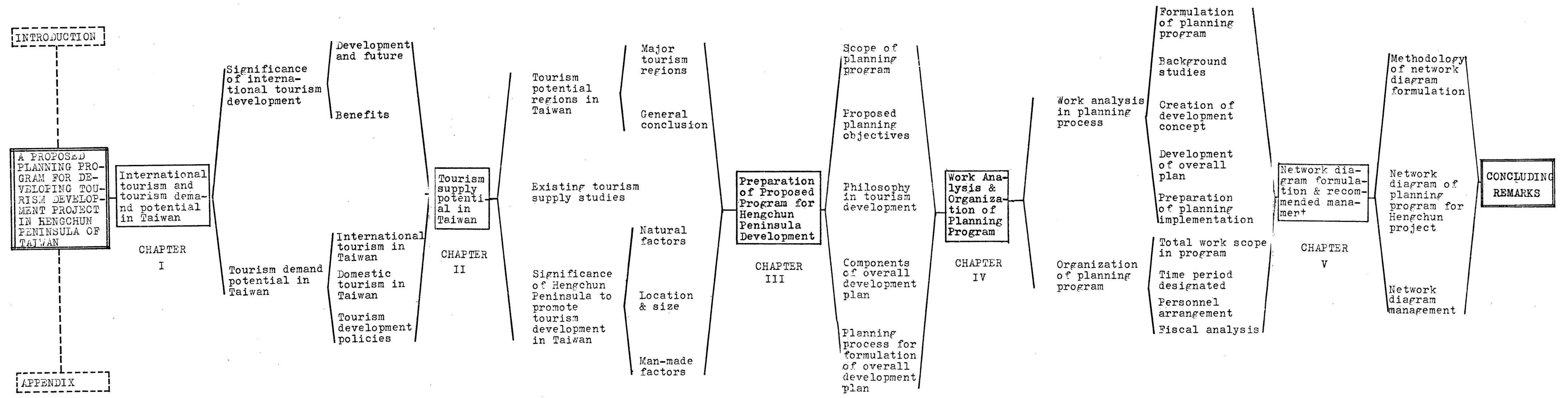
The formulation of planning program includes planning proposal establishment and planning network formulation. The establishment of planning proposal is a basic step for a project in the total planning process. The planning proposal is established based on the realization of needs and demands expected in the designated future period and on the feasibility of planning study available at the present time. The formulation of planning network is to describe and delineate the works to be performed, the work labor required, the time scheduling, the personnel arrangement and the fiscal condition analysis. Planning program is used to guide the completion of development plan for any kind of development project. In other words, it is deciding in advance that WHAT, WHEN, WHERE and HOW actions

will be taken and WHO will take them. As the formulation of planning program provides a general guide for successful approaching the completion of development project, it is generally carried out as the first phase in the practical planning process of any project.

The diagram of total study scope is shown in FIGURE-1. This report is comprised basically of five chapters. The first two chapters are the general description on tourism demand and supply potential in Taiwan and feasibility of Hengchun Peninsula tourism development. The third and fourth chapters are the preparation, analysis and organization of proposed planning program for tourism development in Hengchun Peninsula. The fifth chapter gives the formulation of network diagram and recommended management for the proposed planning program. As a conclusion, some remarks are also included in this chapter. The materials to be used as references for this report are listed in the appendices and bibliography.

The proposed study is concerned the international, national and local factors for tourism development planning in Hengchun Peninsula of Taiwan. It is suggested that the qualified persons to carry out this study should be the persons with the general knowledge and professional experiences in Taiwan as well as those countries of the great tourism market potential for Taiwan.

FIGURE-1 TOTAL STUDY SCOPE DIAGRAM



CHAPTER I
INTERNATIONAL TOURISM AND TOURISM
DEMAND POTENTIAL IN TAIWAN

A. SIGNIFICANCE OF INTERNATIONAL TOURISM

During last two decades or so, the growth of international tourism has been witnessed as one of the major industries in the world. Since early 1950s, international tourism has grown rapidly, particularly after the liberalization of foreign exchange and travel restrictions which characterized the years following World War II. In early 1960s, international tourism spread more widely and developing countries began to benefit increasingly from its growth. This development is a reflection of the changing life styles of industrial countries which have resulted in a steadily increasing income level, a growing amount of leisure time, a rise in education level, the improving of transportation facilities and the growing of international exchange and relationship. The continuously decreasing working period made possible by the mechanized productions, growing per capita income and improved travel facilities indicate that tourism would develop as a booming industry in the future years which would require minimum investment but would bring in maximum returns.

Tourism industry provides the following economic benefits for every country:

1. Effect on national income --- The money spent by tourist

circulates through the economy of the country where it is spent. It changes hands a number of times, and is spent and respent. The more times it changes hands and the more times it is spent, the greater the economic impact effects the economy. Tourist expenditures effect the national income of every country.

2. Effect on tax revenues --- It makes sense to measure the economic importance of tourism by the business that is generated by the money that tourist spent, it also makes sense to measure tax revenues from tourism in the same way: that is, by determining how much in tax revenues accrues to governments from business that is created by tourist expenditures.
3. Effect on jobs and wages --- Based on the study of Bureau of Foreign Commerce in U. S. Department of Commerce, 54% of tourist expenditures was paid out in salaries and wages. (It must be stressed that this can be regarded as a minimum figure in the course of five transactions during a one-year period.)*1
4. Effect on balance of payments --- Spenditure of international tourists are bound to have a positive effect on the balance-of-payments position of any economy. In 1958, for example, Hong Kong had a heavy trade deficit, which was considerably mitigated by tourist expenditures. This is also true to a lesser extent in Thailand.*2 The fact remains that, without expenditures of international tourists, the majority of developing countries in the

world would have had a weaker position in balance of payments and may probably have been forced to cut back on imports.*3

Apart from economic benefits, international tourism facilitates the promotion of international friendship, cooperation and understanding as well as cultural infusion. These factors grossly contribute to peace and diminish the chances of armed conflicts in the currently war-termed world. With this perspective and understanding in mind, the various national and local governments are presently involved in promoting intensive tourism planning and development within their area.

B. TOURISM DEMAND POTENTIAL IN TAIWAN

1. International Tourism

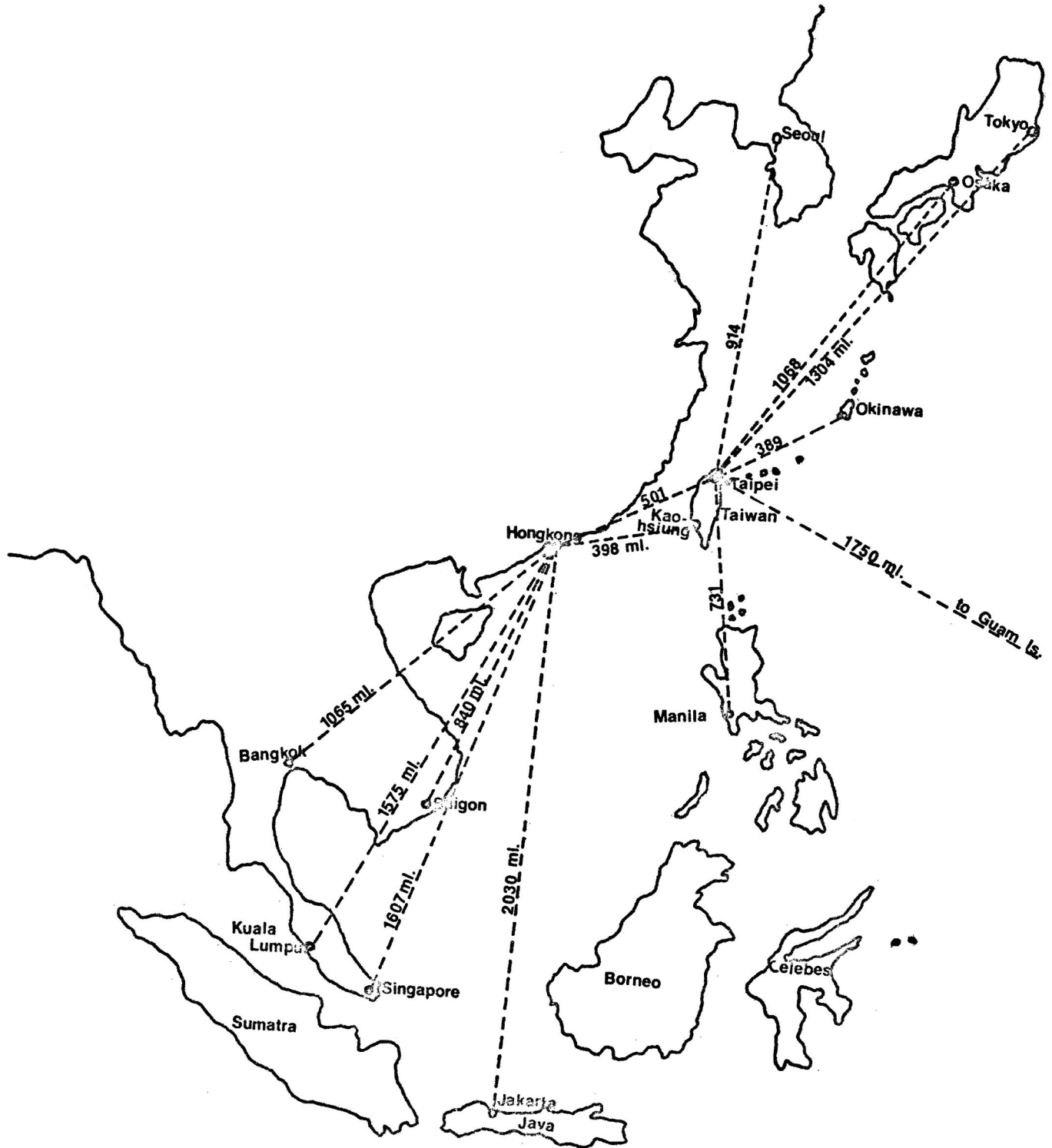
Historically, Europe has dominated the tourism industry as an international destination. However, in recent years, travel in the Pacific and Far East is one of the fastest growing markets in the world and enjoys an increase in international tourist arrival more than three times greater than the world increase rate.*4 Many travellers having seen Europe, are now desiring new experiences and looking for friendly and exotic vacation spots. There is a great potential for international tourists to visit the Pacific Areas with more money and more time in future.

Taiwan is one of the tourist destination areas in the Pacific and Far East. It possesses three major tourism assets:

- a. A prime geographic location ---Taiwan is astride the main air route between Japan and Hong Kong in the Pacific area. Taiwan can be easily visited with no extra expense while the tourists are in the Pacific area. FIGURE-2 shows the geographic location of Taiwan among Japan, Korea, Hong Kong, the Philippines, Vietnam, Thailand, Singapore, Malasia and Borneo. It also indicates the major air routes and their mileage in this area. Taiwan possesses a very high advantage in tourism development potential considering the geographic location in the Pacific area.
- b. The Chinese atmosphere --- It includes customs, traditions, food and way of life, which, because of their sharp contrast to Western life, are of great interest to tourists. Taiwan is the only place in the free world where the cultural heritage of ancient China can be freely observed and experienced. It embodies all the best of ancient and modern China -- the real authentic China.*5
- c. Benefits of beautiful scenery and a tropical climate --- Taiwan is an island of unspoiled natural beauty. It has been recognized in the Western world as "Formosa" which means "The Beautiful Island".

With these international tourism assets, Taiwan is one of the most rapidly growing tourism destination areas in the Pacific

FIGURE-2 GEOGRAPHIC LOCATION OF TAIWAN IN FAR EAST



area. TABLE-1 shows Taiwan enjoyed the second fastest growth rate of tourist visitation in this area from the year of 1965 to 1969 and its growth rate is nearly 1.5 times more than that of total Pacific area. These tourism assets are also largely responsible for the fact that the tourist growth rate in Taiwan during the years of 1961 to 1971 has averaged approximately 30 percent annually which was indicated in TABLE-2.

In addition, regional tourism can also be expected to expand in the Pacific area. The greatest growth region is likely from Japan to nearby destinations such as Korea, Taiwan and Hong Kong. Taiwan will benefit from the fast growth of the Japanese market.*6

The statistical trend indicates the increasing international tourist arrivals in Taiwan in future. Some studies made by Belt, Collins & Associates, Ltd. in their preparation of TAIWAN VISITOR INDUSTRY PROGRAM remarked:

"Our projections are based on trend analysis of contributing market regions. Consideration was given to industrial growth in Taiwan, which has been dramatic, but has not maintain the pace of visitor industry. The importance of business visitors as industry expands is reflected in the forecasts source of visitors, but not as important as the pleasure visitor market. The resultant figures were related to the capability of each region to provide international visitor as determined by the developing economic patterns of the countries within the regions. They were also related to travel projections of the other Far Eastern countries."* 7

One of their projections on international tourist arrivals in Taiwan was shown in FIGURE-3. All of these reveal

TABLE-1 Tourist Growth in the Pacific Area

Country or Area	*Total Tourists		Growth Rate (%)
	1969	1965	
Total	4,741,181	2,226,227	213
Taiwan	414,448	133,666	310
Hawaii	1,369,058	606,010	226
Hong Kong	765,213	446,743	171
Japan	608,744	336,649	166
Thailand	409,784	223,025	209
Singapore	408,709	98,481	415
Australia	361,277	173,400	208
New Zealand	220,685	122,288	180
Philippines	123,208	84,013	147

Source: International Union of Official Travel Organization (IUOTO), International Travel Statistics, 1970

*Remarks: Inclusive of U.S. Foreign Servicemen on R. & R.

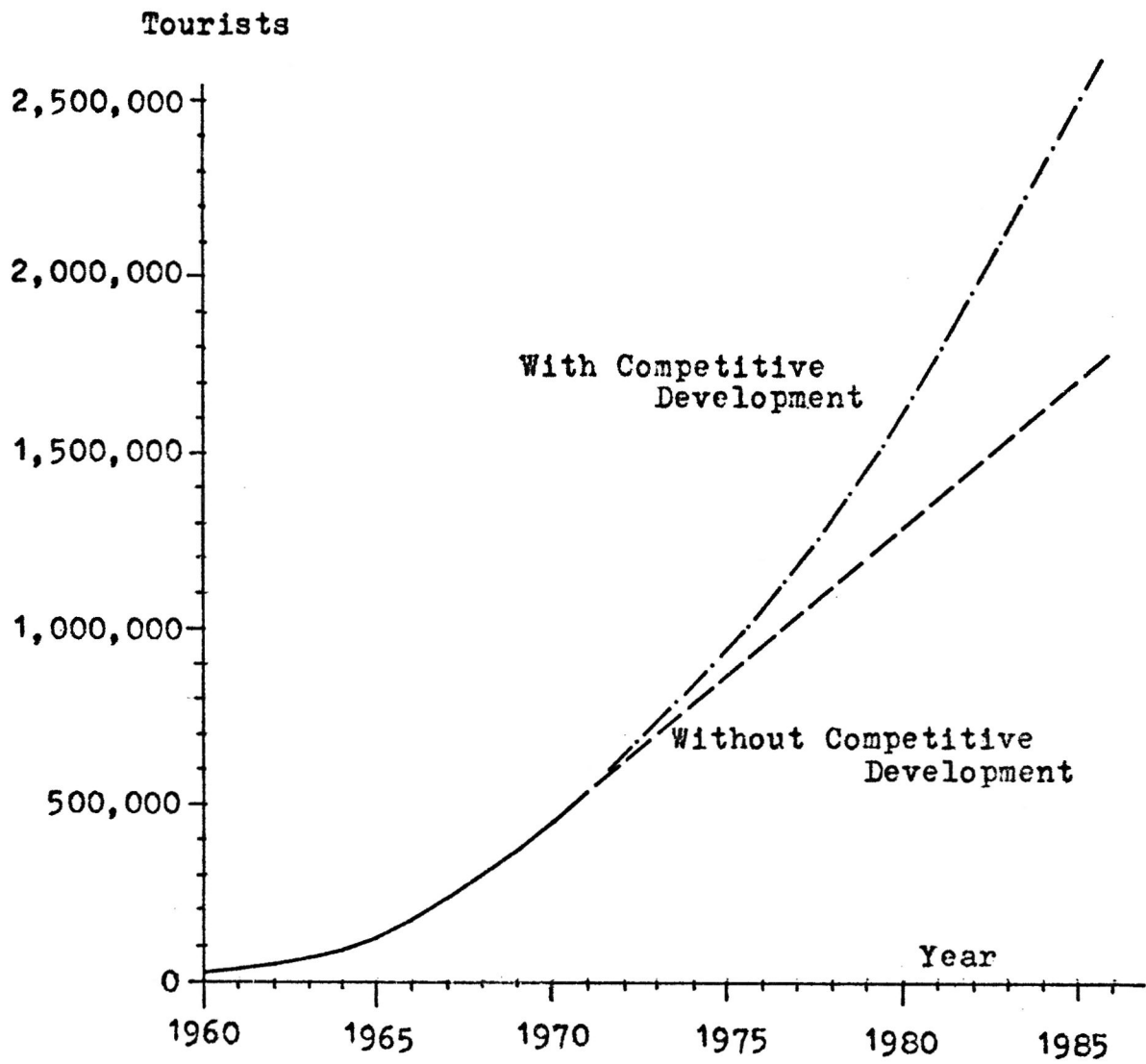
TABLE-2 Number of Tourist in Taiwan (1961-1971)

Year	*Number of Tourist	Growth Rate (%)
1961	42,205	-
1962	52,304	23.93
1963	72,024	37.70
1964	95,481	32.57
1965	133,666	39.99
1966	182,948	36.87
1967	253,284	38.42
1968	301,770	19.20
1969	371,473	23.10
1970	472,452	27.18
1971	539,775	14.30
Average		29.33

Source: Tourism Council, Ministry of Communications, Republic of China, 1971

*Remarks: Exclusive of U.S. Foreign Servicemen on R. & R.

FIGURE-3 Projection on Number of Tourist in Taiwan



that the international tourism demand in Taiwan has a great potential and a very bright future.

2. Domestic Tourism

Traditionally, the economy of Taiwan has been primarily based on agriculture. However, in the past fifteen years under the pressure of population growth, the government of Taiwan has made the great effort to balance the economy through industrialization and thus enhanced the quality of urban life. Having the advantage of labor force and convenience of transportation networks, industrialization in Taiwan has grown very rapidly. This growth enhances the expansion of international and national exchange and promotes the living standard of people in Taiwan. All of these have produced a great dramatic change which is visible on every hand.

With increasing prosperity and leisure time, higher living standards and education level, more public transportation facilities, and wider ownership of vehicles (particularly, motorcycles), recreation activities and vacation travels in Taiwan are getting more and more popular. Recreation activities, weekend day-outing and vacation travel have become one of the major portions in the life of people in the urbanized areas of Taiwan. As the nation moves into an economy of related affluence, the population will search for new experiences. It is evident that more and more people in Taiwan are traveling in increasing times, both internationally and nationally.

TABLE-3 shows the statistical data of domestic visitors in nine recreation areas which are located in different region of Taiwan (FIGURE-4). In comparison with the total population in Taiwan, the growth rate of domestic visitors in these areas increased in the recent years. This indicates the great prospective potential in domestic tourism in Taiwan. In the foreseeable future, the domestic tourism in Taiwan will be mainly confined to the nation's boundaries.

3. Government policies

The Republic of China is a member of the International Union of Official Travel Organization (IUOTO), the Pacific Area Travel Association (PATA), and the East Asia Travel Association (EATA). The Ministry of Communications is in charge of the development of the tourism industry through its Tourism Bureau, which was established in June, 1971. Prior to the setting of the Bureau, the Tourism Council of Ministry had been responsible for coordination, planning and promotion on an international scale. The Bureau works closely with the Taiwan Visitor Association, private travel organizations and other setups at the provincial and local levels.

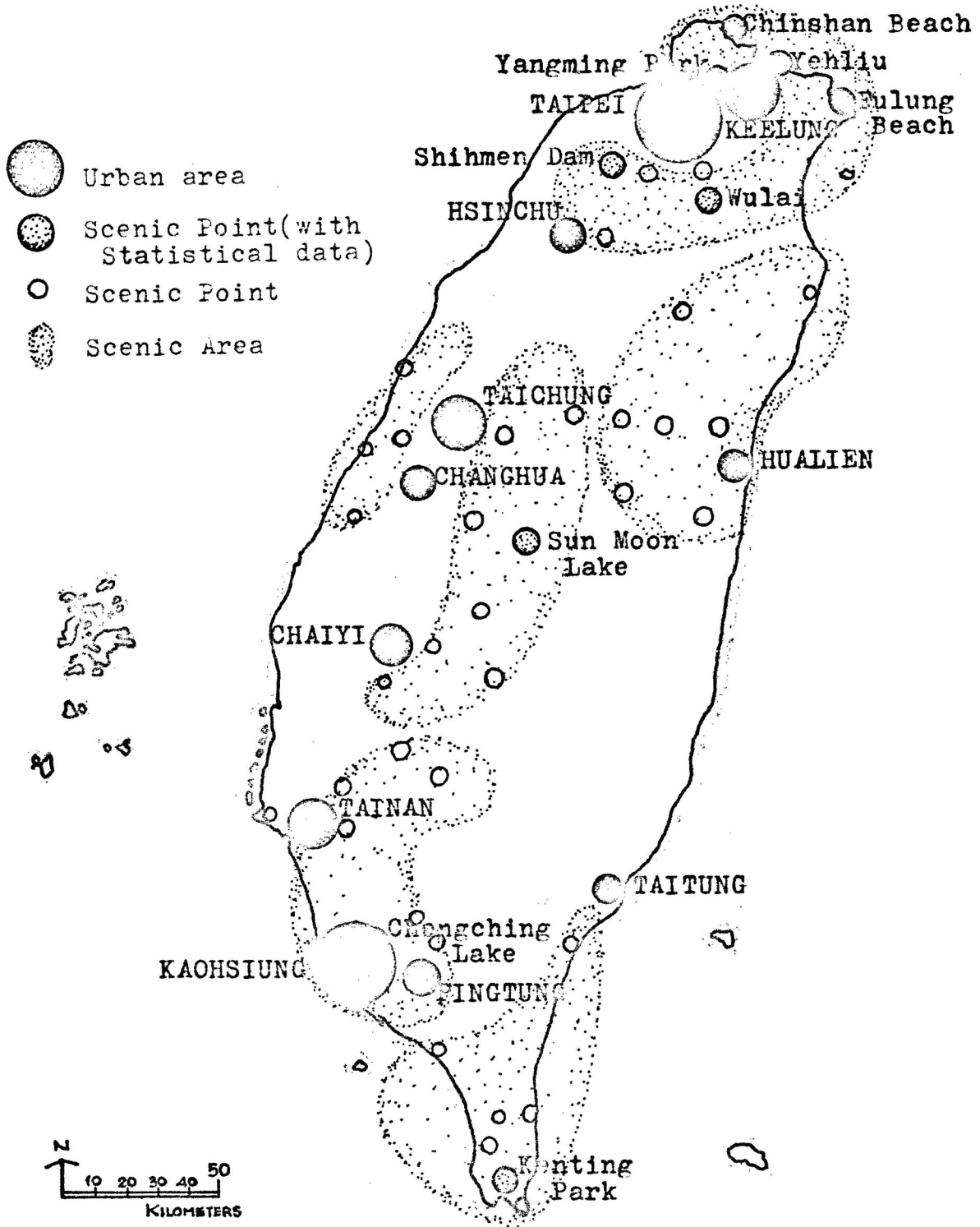
During the last decade, the government of Taiwan has made progress in developing international and domestic tourism as means for economic development and for bolstering its national economy and improving its balance of payments. As direct results of the improvement of tourism facilities, the simplification

TABLE-3 Number of Visitor in Several Scenic Areas
with Statistical Data Available in Taiwan

Scenic Area	Number of Visitor					
	1965	1966	1967	1968	1969	1970
Yangming Park	925,000	1,018,000	1,248,000	1,300,000	1,585,000	1,694,000
Chengching Lake	748,247	817,289	884,483	903,576	924,998	1,025,726
Chinshan Beach	67,953	81,572	90,413	98,733	103,041	160,007
Wulai	178,803	228,323	516,176	667,405	626,706	606,158
Yehliu	406,726	480,866	476,741	480,437	495,374	542,796
Shihmen Dam	495,356	603,150	605,519	639,101	602,031	698,006
Sun Moon Lake	220,893	253,373	294,051	326,932	391,230	393,038
Fulung Beach	24,940	26,733	30,891	37,053	50,030	54,908
Kenting Park	188,983	214,154	247,371	277,456	296,131	358,908
Total	3,256,901	3,723,960	4,393,645	4,720,693	5,074,541	5,533,447
Population of Taiwan (1,000)	12,628	12,992	13,296	13,650	14,037	14,602
	25.8%	28.9%	33.0%	34.6%	36.2%	37.9%

Source: Belt, Collins & Associates, Ltd. TAIWAN VISITOR INDUSTRY PROGRAM
PP.94

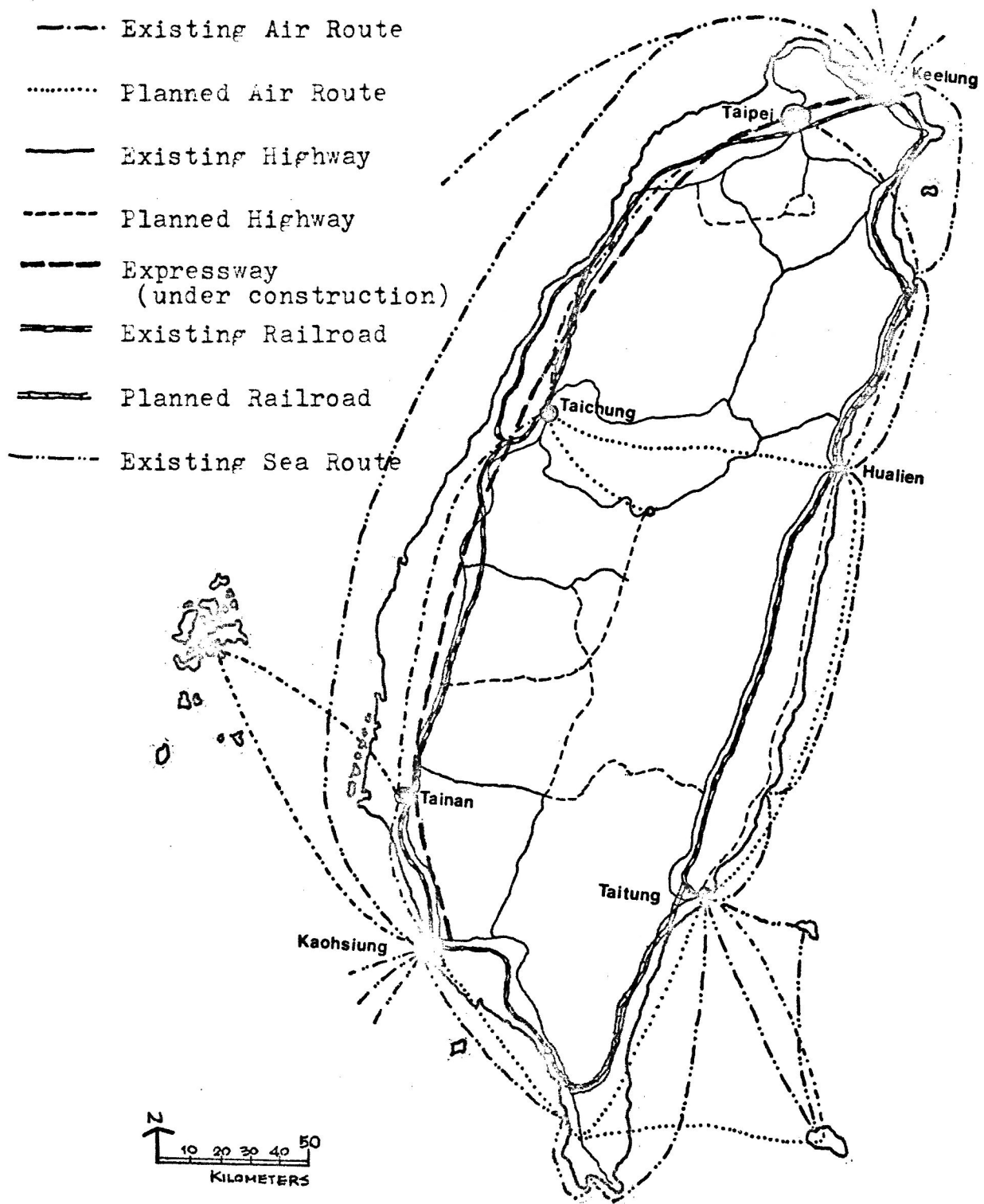
FIGURE-4 SCENIC AREAS IN TAIWAN



of entry procedures and intensive widespread promotion on transportation networks and facilities (FIGURE-5), the government policies in tourism development indicate the great advantage for tourism promotion in Taiwan.

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- *1, *2, *3 U. S. Department of Commerce, Bureau of Foreign Commerce, THE FUTURE OF TOURISM IN THE PACIFIC AND FAR EAST, Chapter I and II, pp.1-54.
 - *4 Organization for Economic Cooperation and Development (OECD), TOURISM: IN OECD MEMBER COUNTRY.
 - *5 Wei, James, CHINA YEARBOOK 1971-1972, Tourism Industry Section.
 - *6 World Bank, TOURISM-- SECTOR WORKING PAPER, Chapter I.
 - *7 Belt, Collins & Associates, Ltd., TAIWAN VISITOR INDUSTRY PROGRAM, Section VI "Visitor Industry Analysis", pp.68-96.

FIGURE-5 TRANSPORTATION NETWORKS IN TAIWAN



CHAPTER II
TOURISM SUPPLY POTENTIAL AND
HENGCHUN PENINSULA OF TAIWAN

A. TOURISM SUPPLY POTENTIAL AREAS IN TAIWAN

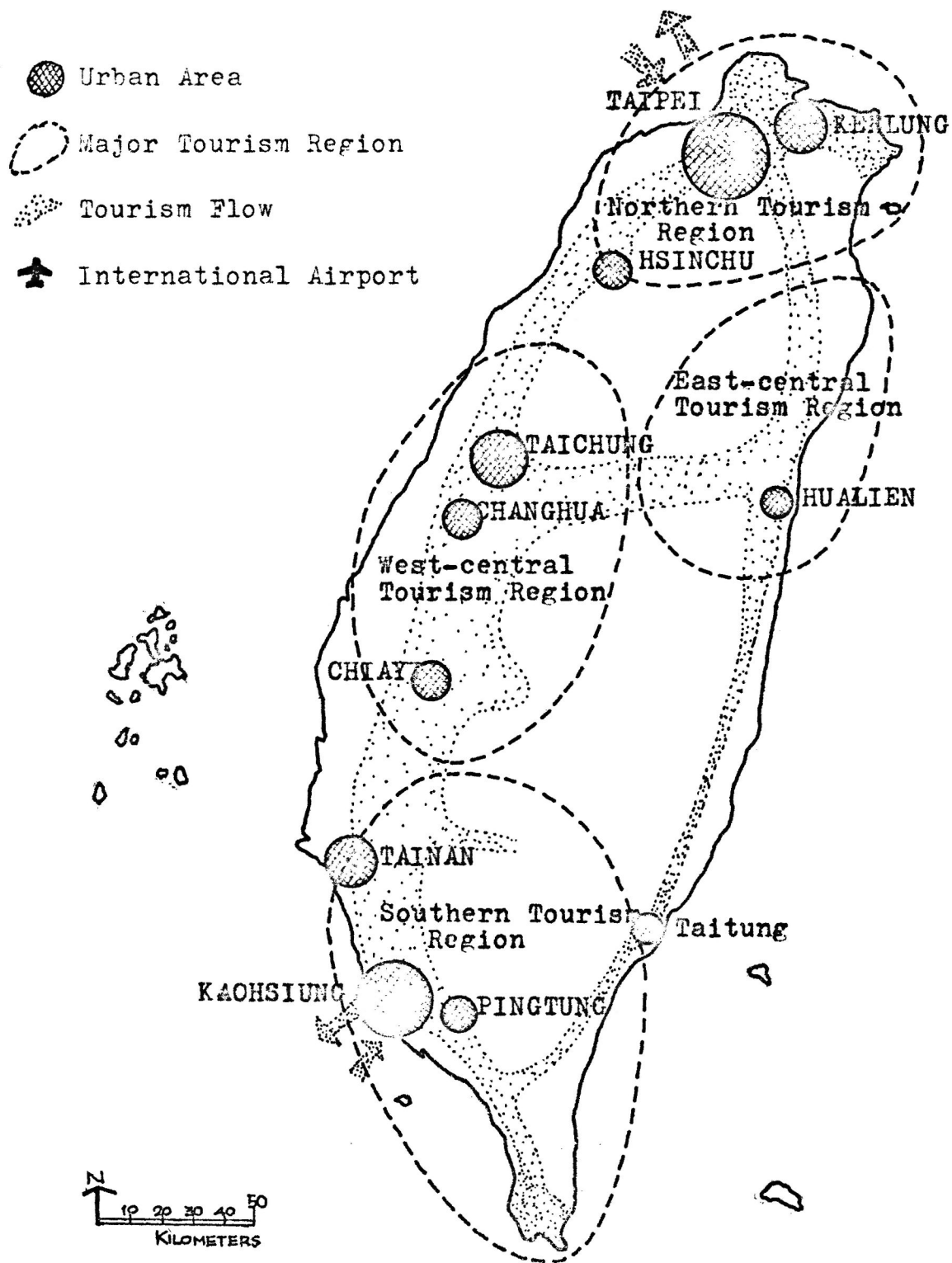
In order to meet the needs and demands of both international and domestic tourism development in Taiwan, it is necessary to develop the tourism potential areas. This kind of development would enhance and contribute to the tourist growth rate on both international and domestic tourism. Several studies have already been made by many national and international professionals on scenic points, areas and regions in Taiwan concerning tourism development and recreation resource development. These studies include the report prepared by Taiwan Tourism Bureau with cooperation of seven consultants from Japan in 1969, the report prepared by Belt, Collins & Associates, Ltd. of Hawaii in 1970, the report prepared by Chinese Tourism Corporation in 1972, and a series of studies prepared by different governmental and private agencies in Taiwan.

On the basis of these studies, the major tourism development potential areas in Taiwan may be divided into four regions:

1. Northern tourism region
2. East-central tourism region
3. West-central tourism region
4. Southern tourism region

FIGURE-6 shows these four regions in Taiwan. With dif-

FIGURE- 6 MAJOR TOURISM REGIONS AND TOURISM FLOW IN TAIWAN



ferent conditions of geographic location, climate, topographic feature, natural and man-made environment, each region is gifted with the variety of attractions and characteristics as the main underlying factors for tourism development. However, with regard to the potential on both international and domestic tourism development for future demands, a general agreement from all of these reports was found. The Northern Tourism region is limited in physical size because of the overcrowded cities and towns in it. The Central Tourism regions are confined their tourism activities only on high-mountainous areas due to the geographic condition. The Central regions have a great potential in domestic tourism development, but they are limited in international tourism development because of the geographic conditions and transportation difficulties. The area which can best provide the greatest potential to meet the future needs and demands in tourism development is in the Southern region. Particularly, the southernmost part of Taiwan, which is called "Hengchun Peninsula", provides the best feasibility in the promotion of tourism development in Taiwan.

B. SIGNIFICANCE OF HENGCHUN PENINSULA TO PROMOTE TOURISM DEVELOPMENT IN TAIWAN

1. Location and Size

Hengchun Peninsula is located at the southernmost part of Taiwan. Geographically, it extends from the line between Fangliao of Pengtung County and Tawu of Taitung County south

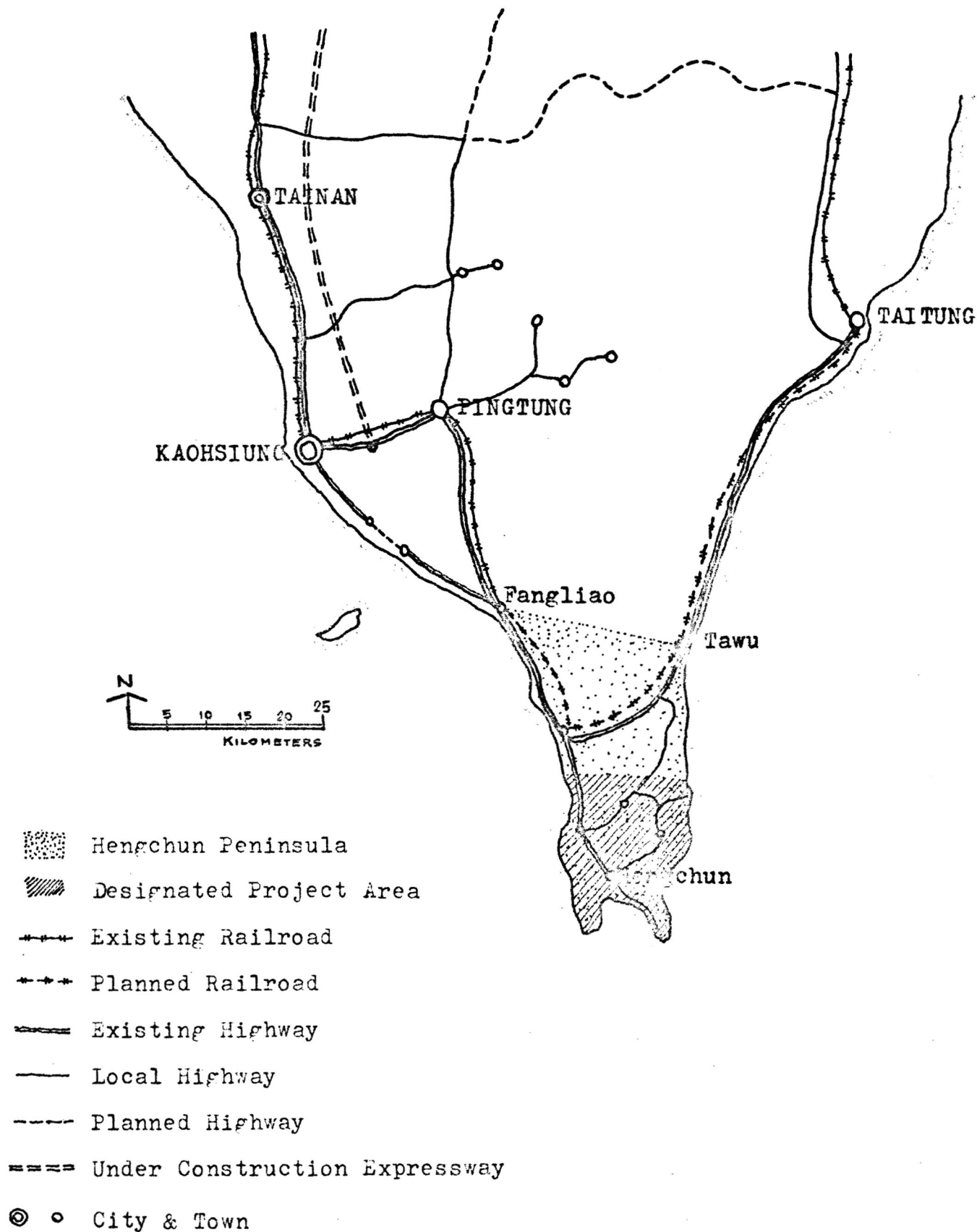
to the tip of Taiwan (FIGURE-7). Town of Hengchun, the southernmost town of Taiwan, with population about 40,000 is the biggest town in this area. In the Southern Tourism region of Taiwan, Hengchun Peninsula is within the range of one-day driving distance from the industrial city of Kaohsiung, the biggest seaport of Taiwan and Taiwan's second biggest city with an international airport. The existing access is a highway of 110 kilometers from the international airport of Kaohsiung. This highway is lined by casuarin trees which make driving along the coast quite enjoyable.

The total area of Hengchun Peninsula is about 750 square kilometers (290 square miles) which nearly equals to one fortieth of Taiwan. Hengchun Peninsula can be divided into two parts by topographic condition: the mountainous area which is higher than 1600 feet in the north part of Peninsula and the moundous, plain and water area in the south.

2. Tourism Potential

"Hengchun" in Chinese means "Spring Time Forever". This gives the best indication of the climatic condition in this area. Since this area is within the tropics, the environment of the Peninsula is strongly influenced by the tropical climate. The vegetation is predominantly tropical, and coral reefs are seen along the coast of deep blue seas. The Peninsula abounds in natural and cultural resources --- the historical town of Hengchun, the battlefield of Shihmen, the hot springs of Szechungchi, the lighthouse of Oluanpi, a waterfall and unusual rock

FIGURE-7 HENGCHUN PENINSULA IN SOUTHERN TOURISM REGION OF TAIWAN



formation of Chialoshui, the coastal highway, the tropical flora along the road and in the Kenting Botanical Garden, the Kenting National Park and the stalactite cave and coral reefs --- providing the great potential in tourism development.*8 The topographic condition of Hengchun Peninsula are shown in FIGURE-8. The man-made factors concerning with the tourism development in this area including land usage, transportation networks and facilities are shown in FIGURE-9.

3. Feasibility of Development

Hengchun Peninsula provides the greatest potential for tourism development because of the excellent beaches, clear, warm water, pleasant climatic conditions, scenic environment and other natural factors in this area. Another advantage of this area for development is a relatively undeveloped land area, most of which is under government ownership. All other possible sites in Taiwan are limited by physical size from accommodating substantial development and/or by man-made establishments that have already destroyed the natural beauty of the site. Hengchun Peninsula has the potential in substantially developing and expanding in future without unnecessary overcrowding the area and diminishing or destroying its scenic qualities. It is for this reason that with a great potential in natural and environmental resources and a least restriction in man-made development, Hengchun Peninsula should be given the first priority in developing tourism industry in Taiwan.

*8 Belt, Collins et, al., TAIWAN VISITOR INDUSTRY PROGRAM, PP. 176-194.

FIGURE-8 TOPOGRAPHIC CONDITION OF PROJECT AREA IN HENGCHUN PENINSULA

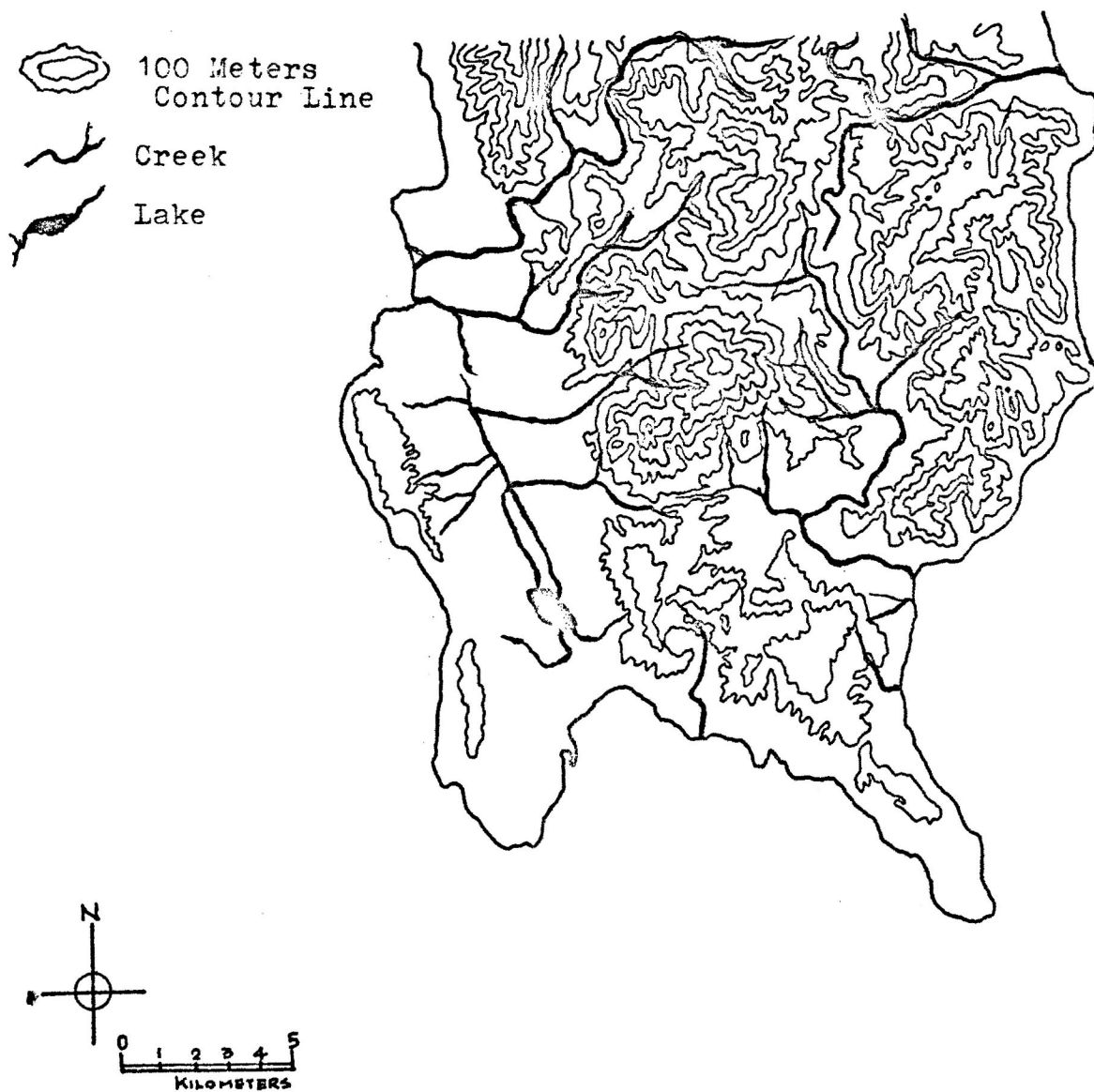
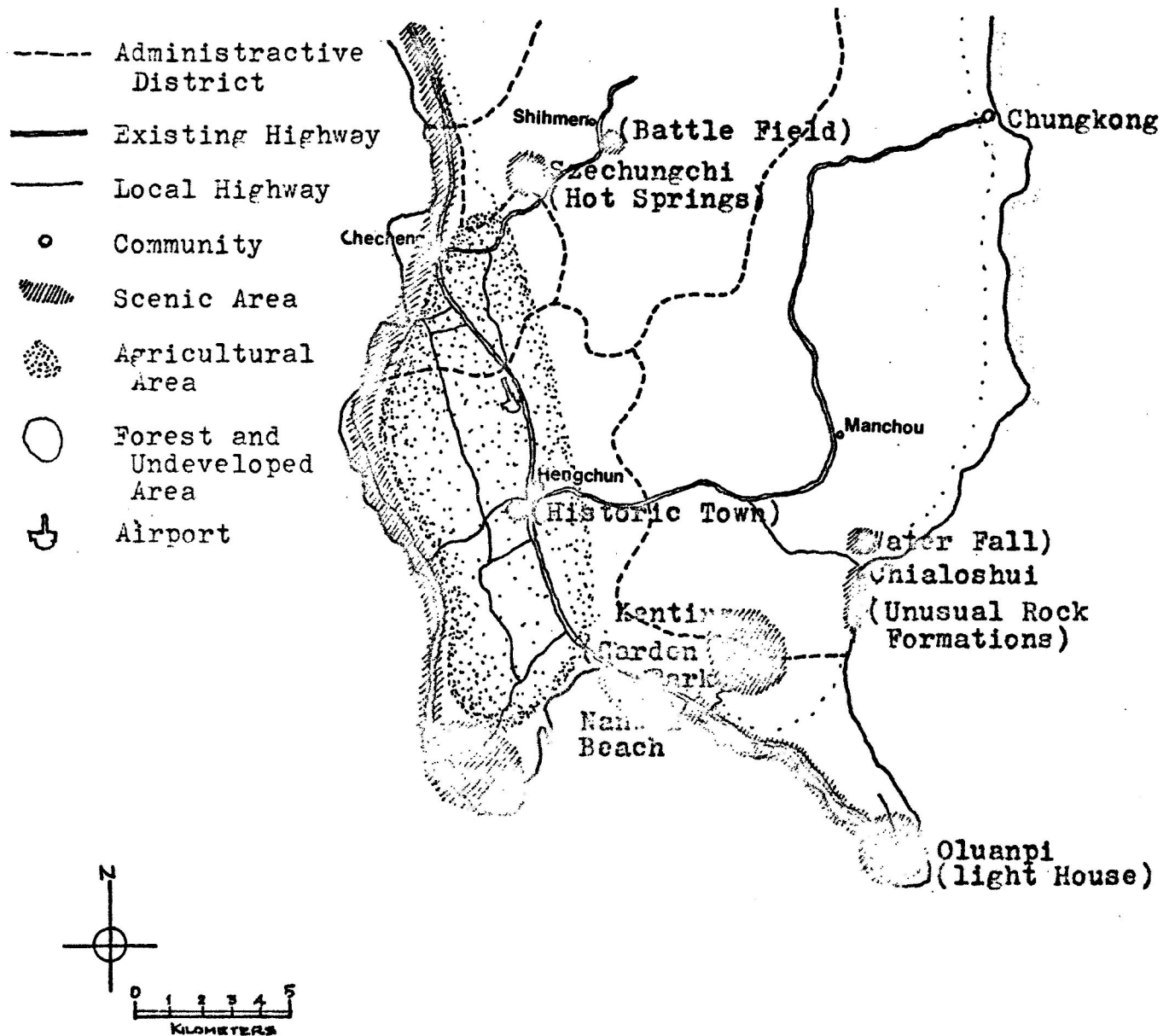


FIGURE-9 MAN-MADE CONDITION OF PROJECT AREA IN HENGCHUN PENINSULA



CHAPTER III
PREPARATION OF PROPOSED PLANNING
PROGRAM FOR HENGCHUN PENINSULA

A. SCOPE OF PLANNING PROGRAM

In the process of tourism development in Hengchun Peninsula, before undertaking the background studies, it is necessary to prepare the proposed planning program with the following work scopes as the first step in formulation of the development project:

1. To provide the basic preparation of planning program for tourism development project.
2. To outline proposed development goals, objectives and policies as well as various means of achieving planning goals in the project.
3. To create planning philosophy, principle, and theory as the basic criteria guiding the formulation of project plans.
4. To develop methods, standards and techniques required for the planning of land use, traffic and transportation circulation, facilities and utilities, and tourism development based on local, regional, national and international conditions.
5. To obtain the necessary knowledge by insuring inclusion of up-to-date physical and socio-economic data and information as a beginning for the effective planning.

6. To delineate the work scope in planning process for accomplishment of project plans.

B. PROPOSED PLANNING GOALS

The following goals are suggested for the development of Hengchun Peninsula in tourism development program:

1. Develop the Hengchun Peninsula as an international and domestic tourism center in the Southern Tourism region of Taiwan to enhance the local, regional and national economy.
2. Develop this area with concern of the natural beauty and aesthetic environment and protect them from the damaging by any kind of man-made treatment.
3. Provide for a future domestic tourist industry, which would function primarily as a product of the international tourism.
4. Derive maximum social benefits and promote cultural interactions by integrating international tourism with domestic tourism.
5. Provide the potential expansion of facilities and amenities for future population growth and the socio-economic impacts of tourism development in this area.

C. PHILOSOPHY AND PRINCIPLE IN TOURISM DEVELOPMENT

The basic principle of planning approach for the tourism

development in Hengchun Peninsula is suggested to adopt the concept of "Utilizing existing natural environment with optimum man-made intrusion". Such an approach would result in enhancement of the rich natural beauty of the Peninsula for tourism development purpose with the least expense. In the developing of policies, the following "Balance Planning Philosophy" would be suggested:

1. Balance development on both international and domestic tourism;
2. Balance development on both mountain and water areas;
3. Balance development based on both Eastern and Western philosophies on the way of leisure life: the Eastern way of life, people seek their pleasure in the mountain while the Western, in and around the water;
4. Balance development on both passive and active activities on tourism facility planning;
5. Balance development on both tourism and rural community in this area;
6. Balance development on both natural and man-made environment.

The "Balance Planning Philosophy" is an application of "YIN and YANG Principle" in Chinese philosophy. (APPENDIX-B). Such a concept would promote simultaneously the development of international and domestic tourism in this area. The proposed planning concept would bring a balance development of all parts of Hengchun Peninsula. The people in this area would derive the maximum social, economic and cultural benefits from

balance development in this area.

D. PLANNING PROCESS FOR FORMULATION OF DEVELOPMENT PLAN

Successful planning must be a continuing process. It is impossible to obtain a single final ideal solution for planning in a community or area development just as it is impossible for a businessman to develop one single and perfect technique for expanding his business. Time brings changes, and the comprehensive plan must be changed to accommodate the changes. Planning being as a process, as a method of approaching to the needs and demands, the comprehensive and coordinated basis in the planning process is as significant as the plans produced by the process. The total planning process for a long range development is ever cyclical, while within the total planning process the short range project becomes a linear approach to its own objectives. FIGURE-10 indicates the total planning process for long range development and the process for formulation the plan in short range project.

The planning process in formulating the tourism development plan for Hengchun Peninsula is a short range process within the long range process of tourism development in this area. The process for preparation of development plan for this project includes five phases:

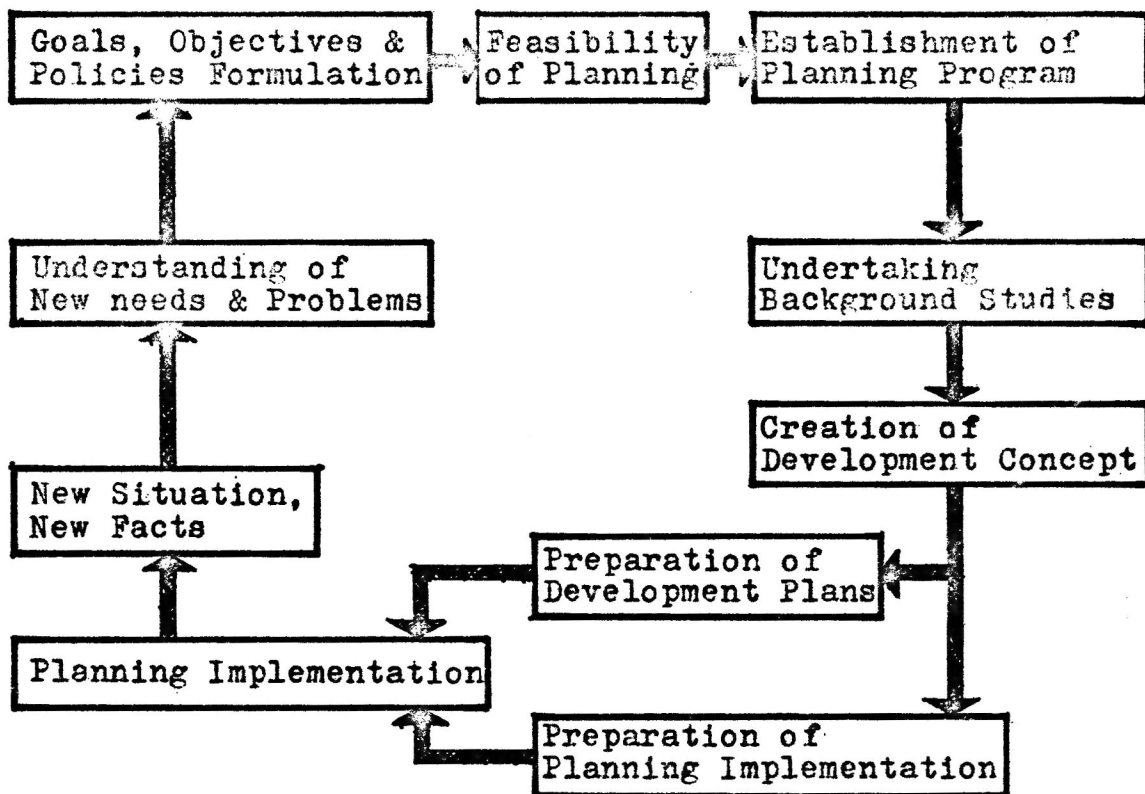
PHASE-1 Formulation of planning program

PHASE-2 Undertaking background studies

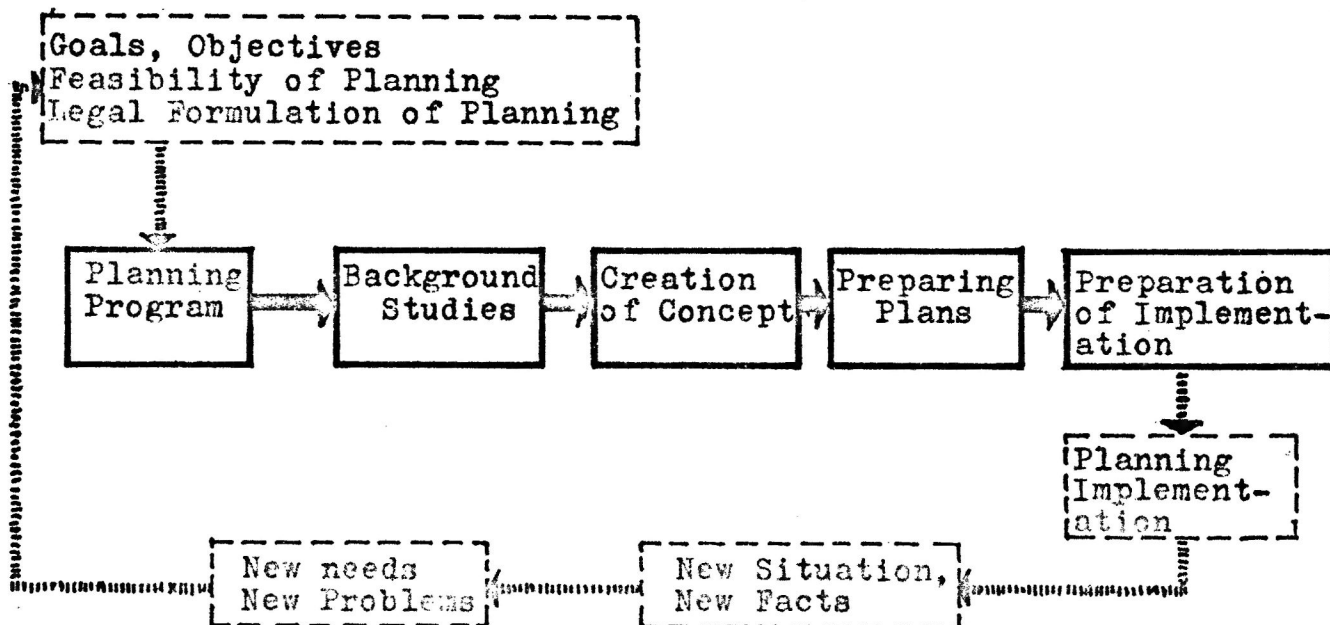
PHASE-3 Creation of development concept

FIGURE-10 Planning Process for Development Project and for Formulation of Development Plans

A. Cyclical Process for Development Project



B. Linear Process for Formulation of Development Plans



PHASE-4 Development of overall plan

PHASE-5 Preparation for planning implementation

In phase one, formulation of a planning program would involve the establishment of work scope, work program and the organization of total work schedule, personnel and fiscal program in the planning process. In phase two, background studies would include the collection, survey, analysis and projection of natural and man-made data and information in project area and its related areas concerning the tourism development. In phase three, creation of development concept would consist of forming several alternative concepts for tourism development in project area and selecting the optimum development concept through cost-benefit analysis of alternative concepts. The concept would primarily prescribe the future land use patterns, transportation systems and tourism attraction development. The optimum concept would be developed into a overall development plan in phase four. The overall development plan would serve as a guide in tourism development for Hengchun Peninsula. In phase five, the preparation for planning implementation would include: (1) establishment of tools for implementation such as formulation of capital program and planning control tools -- planning laws, ordinances, regulations; and (2) preparation of actions for planning implementation such as executive projects and planning legislation.

CHAPTER IV
WORK ANALYSIS AND ORGANIZATION OF PLANNING
PROGRAM IN HENGCHUN TOURISM DEVELOPMENT

In the tourism development of Hengchun Peninsula, from the beginning of the project, all land owners, businessmen and governments should be involved. The project requires a special kind of professionalism. During whatever time period in the planning process of this project, a coordinated team of specialists is required to converge upon the process so that reasonably worthwhile results can be anticipated. The project breadth needs the input of others besides the planner and designer. The planner or designer does not place himself in the position of deciding for others. Because the economy and the market areas of tourism region are important, an economist can make an important contribution. Because businessmen, non-benefit organizations and governments are involved, someone knowledgeable in these fields is also essential. Because the goals of the entire project are directed towards people, a marketing specialist and a human behavior specialist are important too. Emphatically, this project must be placed on a team approach, because no one has the exclusive capacity to perform the total task needed.

As team approach is suggested in this project, it is necessary to develop a planning work program in carrying out every detailed work within the planning process. This program would be used for the planning team to complete the project

effectively, essentially, economically and successfully. This program is formulated basically by work analysis in every phase of planning process and planning organization on time scheduling, personnel arrangement and fiscal condition management. These will be discussed in detail as follows.

A. WORK ANALYSIS IN PLANNING PROCESS

This is the basic preparation for developing work procedures, time scheduling, personnel arrangement and fiscal analysis in forming the comprehensive planning work program. In this section, all the necessary works in each phase of planning process would be described and analyzed.

Phase-1 Formulation of planning program

The major work in the first phase of planning process includes formulation of planning proposal, work program and planning organization. The works required within this phase are listed as follows:

a. Planning Proposal

- (1) Scope of planning program
- (2) Planning goals
- (3) Philosophy and principle in tourism development
- (4) Planning process

b. Planning work program

- (1) Work analysis in process

(2) Work procedure formulation

c. Planning organization

(1) Time scheduling

(2) Personnel arrangement

(3) Fiscal analysis

Phase-2 Undertaking background studies

Within this phase, survey, data collection, analysis and projection are the major works. The information is obtained by means of survey and collection from existing data sources. After that, analysis and projection of the background information are needed. The works involved in the background studies will be discussed separately in the following paragraphs:

a. Survey

(1) Users and markets survey --- This is a survey of users and markets to the project area as a tourism destination. The purpose is to search out clues to the number and interest of people who might make use of the developed environment if it were made available to them. The factors affecting the growth and demand of tourism/recreation are shown in APPENDIX-C. In general, this survey should be:

(a) of representative market areas;

(b) current, not based on outdated studies;

(c) of representative present users of the region;

(d) indicative of trends in competitive areas. These will provide the information on both quantitative and qualitative characteristics of potential users and markets. The human behavior specialist, marketing specialist, demographer as well as the planner should be involved in this survey.

(2) Land ownership and developers survey --- This is to obtain clues to policies and practices which might facilitate or restrain development. This survey consists of following items:

- (a) Existing owners;
- (b) Controller at the present time;
- (c) History of their land development policies;
- (d) Existing land development decisions;
- (e) Some estimates of outside potential owners.

(3) Land use survey --- This is a survey of the existing land use patterns of the area and its potential subdivisions. A survey on a parcel-by-parcel basis of all properties within the area will be undertaken. This work would be carried out with the following information:

- (a) Existing land use patterns
- (b) Community information
- (c) Transportation systems
- (d) Existing recreation and tourism development
- (e) Historic, archeologic and ethnic land

(4) Visual survey --- This is a survey for visual analysis in the whole development area. The following information would be obtained in this survey:

- (a) Zone-attraction potential areas ;
- (b) Aesthetic conditions ;
- (c) Size and shape of project area;
- (d) Image of area .

A visual survey on natural forms, plant materials and existing development patterns will be made in order to locate the areas that are stimulating, inimate, dynamic, proliferated, consolidated or interesting for development. This survey will provide the area with certain landscape characteristics that are worth documenting because of their potential for tourism development.

b. Data collection from existing sources

The planning in tourism development for Hengchun Peninsula is suggested to be separated into two levels: An area project which can provide the broad overall planning possibilities and several zone-attraction complex projects which can identify the detail needs for local action (FIGURE-11). The effort proposed here identifies zones which are appropriate for attractions. Thus, data collection should be carried on two levels:

(1) Area environmental data --- For an area, both data of external and internal factors contribute to the potential for tourism development.

(a) External factors (FIGURE-12)

- 1. Proximity -- location and regional relationship

FIGURE- 11 TOURISM AREA, ZONE-ATTRACTION AND POTENTIAL MARKET AREA RELATIONSHIP

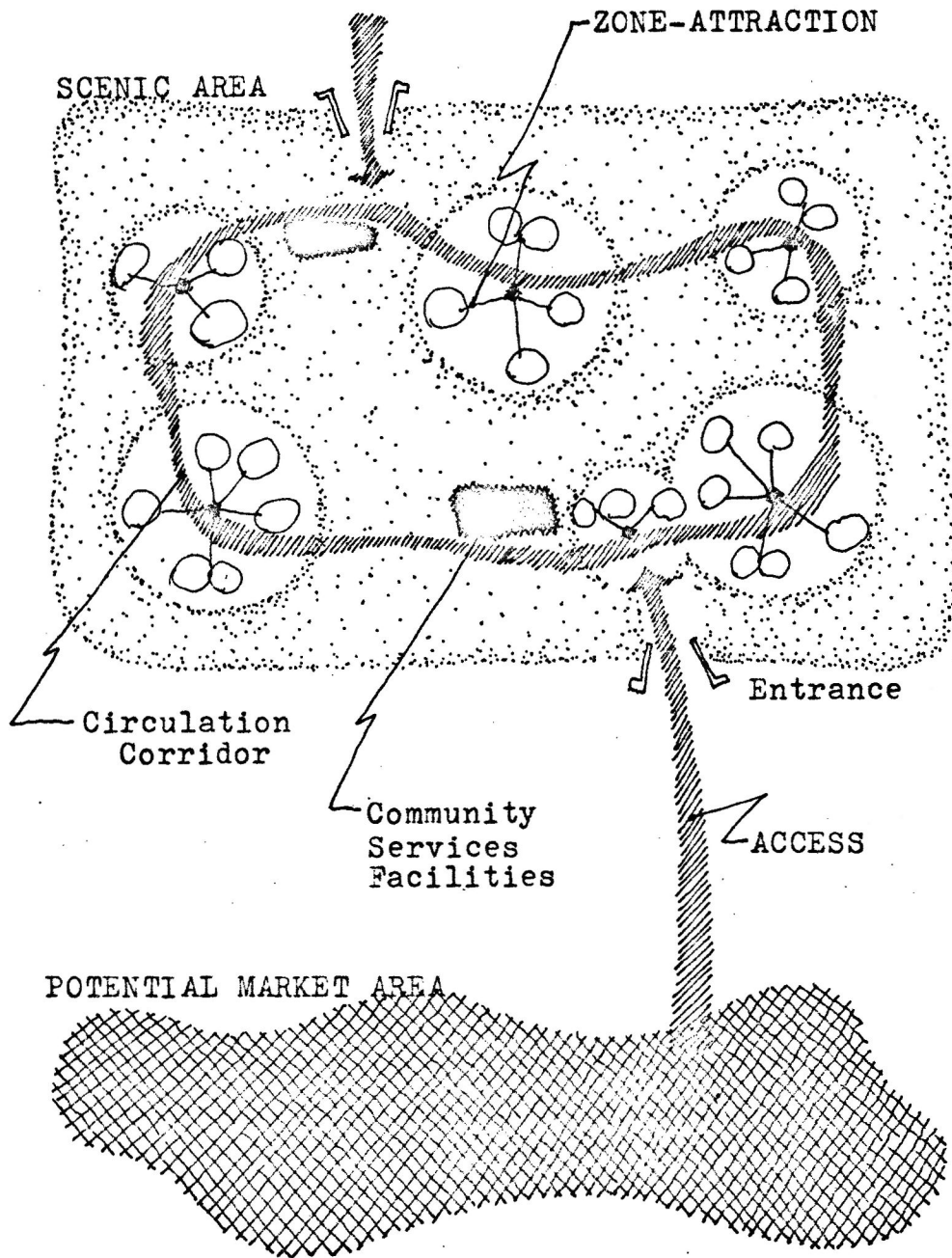
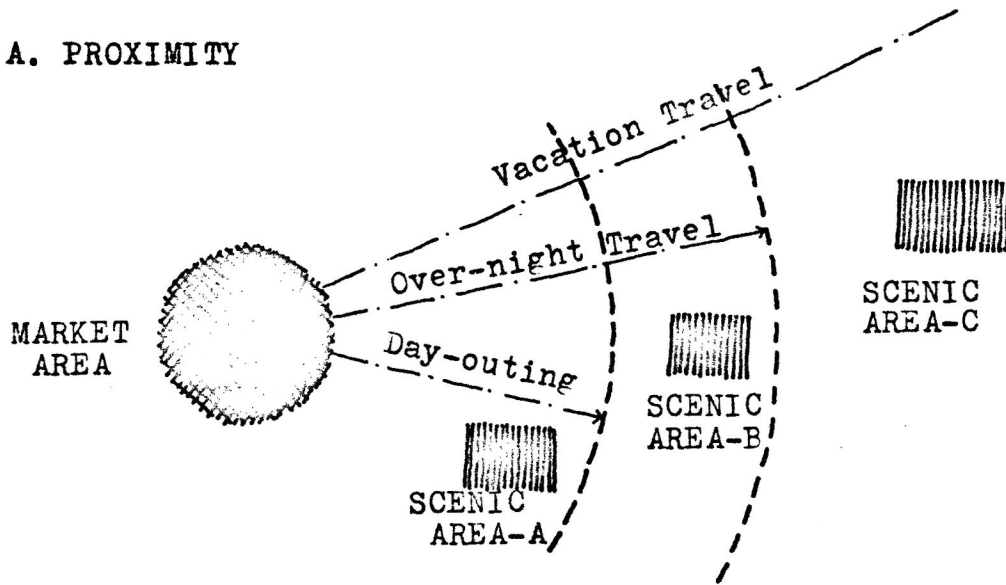
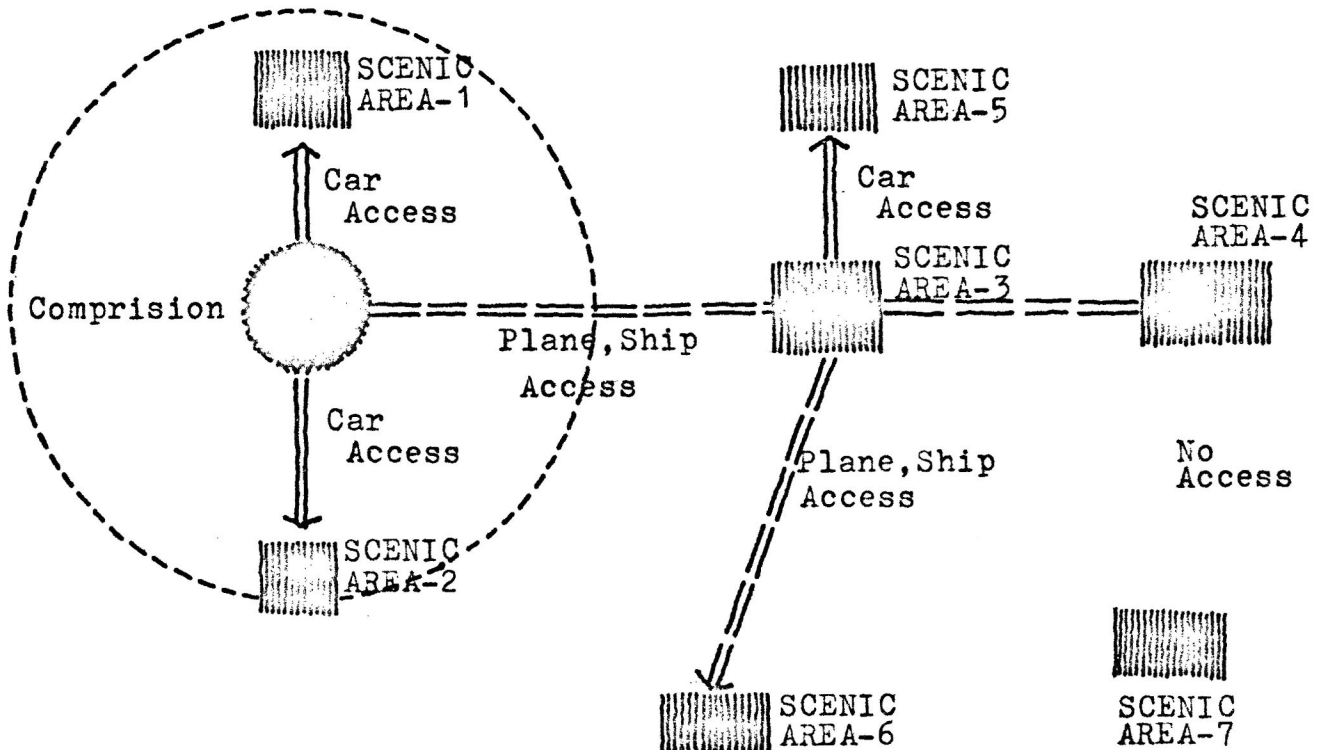


FIGURE-12 CONCEPTS OF PROXIMITY AND ACCESSIBILITY OF TOURISM/RECREATION AREA

A. PROXIMITY



B. ACCESSIBILITY



- ii. Accessibility -- transportation, circulation and facilities

(b) Internal factors

- i. Climatic condition
- ii. Land relief
- iii. Wildlife
- iv. Water and waterlife
- v. Vegetation
- vi. Shoreline
- vii. Community
- viii. Internal transportation
- ix. Historic, archeologic and ethnic factors
- x. Existing land use and tourism development
- xi. Existing service facilities
- xii. Major attractions

(2) Zone-attraction detailed data --- For all zones which have the potential attractions, the detailed data would be collected with the same factors listed above but in more detail.

c. Data analysis and projection

After data collection, the data and information would be studied, categorized and analyzed to realize the existing and future development potential and limitation. Due to the team approach in this project, all data and information obtained from existing sources or by means of survey should be carefully integrated, unified and manipulated.

Phase-3 Creation of development concept

- a. Synthesis and conclusions --- With the data analyzed and mapped, basic features of the area become identified and can be studied for relative importance. Places with similar factors begin to appear and can then be identified. In this stage, it is important to deduce the general overall character of the area. Data about users and markets now can be integrated with resource information to seek out voids and opportunities. Another integration is to accommodate the land-resource assets with the ownership patterns. Ownership policies need to be applied to the qualitative evaluation of land resources to obtain clues to the growth potential of tourism development. These works would include the following means:
- (1) Graphic and word documentation;
 - (2) Graphic summary analysis;
 - (3) Statements of conclusions.
- b. Environment program and concept development --- With the development background studied, idea about the environment program and concept can be developed. The facts of research and conclusion drawn should sparkle with stimulation for the planner or designer. Two major thrusts of this effort should be identified, although in practice they are not always held apart. That is the matter of program emphasizes most the substance of development, whereas the conceptual emphasizes location and

manner in which the design might take place. The coordination of program and concept is one of the secrets of successful planning for development.

- (1) Area program and development concept -- This can be described with words, photographs, sketches, graphics and particular abstract diagrams of functional relationships. All the art of creative environmental planning--land, structures, space -- should be mixed with the science and the art of leisure behavior of people. Most desirable are documents with sketches on that of the entire area.
- (2) Zone-attraction development concept -- It is to make a more detailed investigation and concept planning. The criteria for the selection of these zones within the overall area might be as follows:
 - (a) The greatest number and the strongest quality of resource characteristics;
 - (b) The most readily accessible over present circulation systems;
 - (c) The greatest undeveloped land;
 - (d) The most easily promotable with equal investment;
 - (e) With existing high-quality service centers;
 - (f) With organized development leadership and coordination.
 - (g) With the fewest and least formidable barriers and inhibitors.

In each zone, it is necessary to be identified in greater detail as:

- (a) The assets and liabilities of the resource base;
- (b) Potential activities and their optimum location;
- (c) Travel-purpose categories and trends of users;
- (d) Attraction complex locations;
- (e) Circulation corridors and business-success factors;
- (f) Major service locations.

c. Cost-benefit analysis of alternative concepts --- This is an analysis to select the optimum concept for development. The optimum development concept will be used to formulate the development concept plan. The concept plan is a long range sketch of policy plan showing the schematic regional relationship, land use patterns, traffic networks, public facilities, tourism development patterns and future growth trends. It provides a base to guide the formulating of the overall development plan.

Phase-4 Development of overall plan

a. Comprehensive plan ---As an integration of all plans, the comprehensive plan would show the proposed land use patterns, transportation networks, service systems and

tourism development as a general guide for future development in this area. It includes the following plans:

- (1) Land use plan --- The land use plan relates the growth projects to land usage, and indicates methods for serving the land development problems of this area. This would be accomplished by correlating and adjusting existing and future land uses with emphasis on the need and suitability for land use categories. The plan should be prepared in map form with each land use category illustrated.
- (2) Transportation plan --- A plan for safe, convenient and effective circulation within the project area and for connection with market areas is needed. It would be prepared in coordination with city, county and regional planning officials, the highway department and related communities.
- (3) Public facility plan --- This plan would show the recommended sites and capacities to meet future needs in the project area and the communities in this area.
- (4) Scenic landscape plan --- This is a landscape layout for the entire area such as scenic drive-way landscape, community environment landscape.

b. Designated zone-attraction development project plans --- All zones with major attraction to tourists would be designated as the potential sites for tourism development. These designated projects will be the action program in

the implementation of tourism development in Hengchun Peninsula. They can be divided into three categories:

- (1) Attraction development project;
- (2) Attraction redevelopment project;
- (3) Community attraction project.

Phase-5 Preparation for planning implementation

The preparation for planning implementation is the final phase in formulating planning program. The long-range concept plan and the short-range comprehensive plan would be used as a specific implementation measure. These plans identify the steps and procedures to be followed in carrying out planning goals and objectives. The following works should be prepared to be accomplished with those plans in planning implementation:

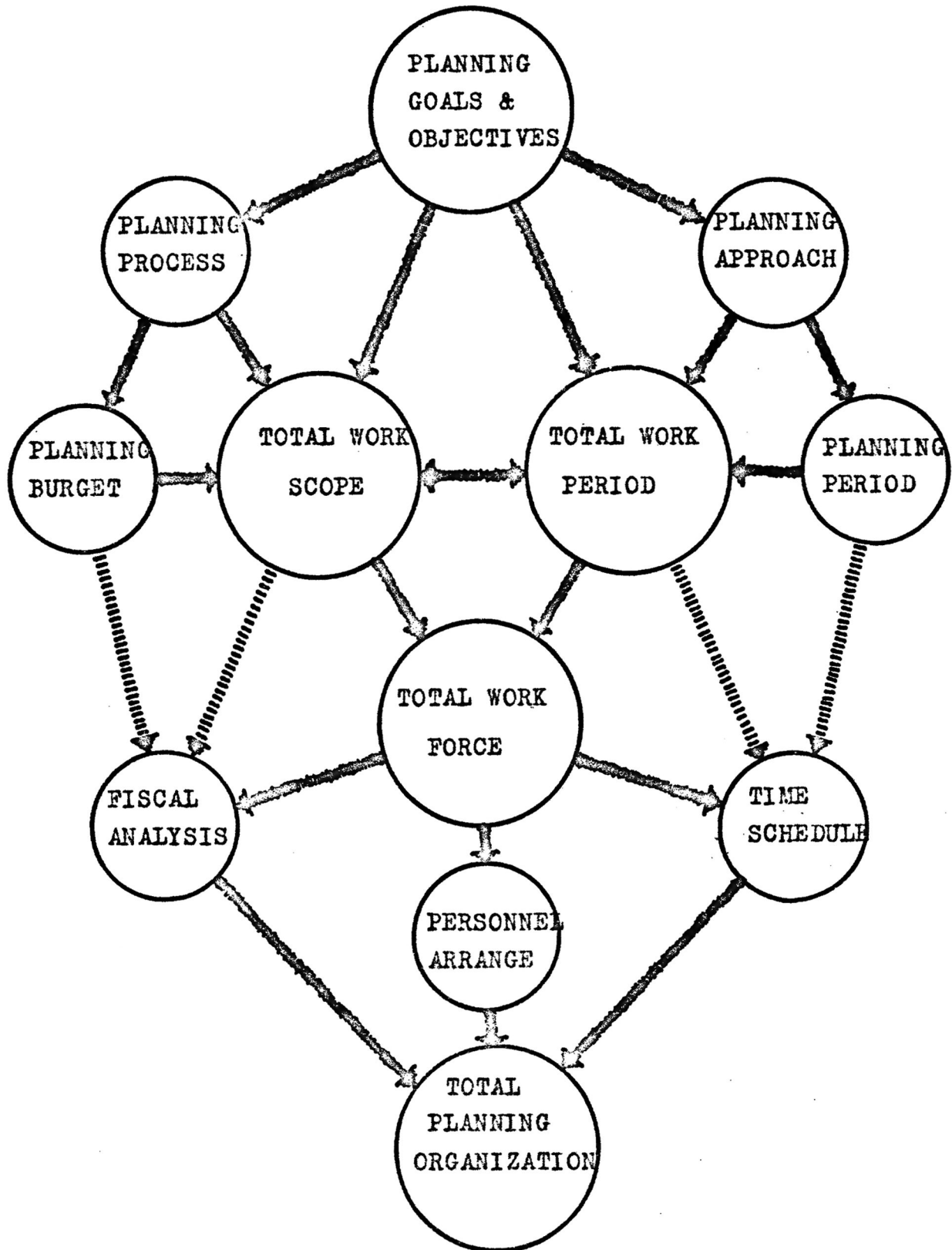
- a. Establishment of capital program --- A financing program would set forth priorities and assign responsibilities for the proposed project requiring the expenditure of capital funds to the end period of plan. The plan would base upon anticipated local costs, projected community revenues, borrowing capacity and available state and national grants.
- b. Planning implementation authority formulation --- An official planning authority should be established in charge of the implementation of project. Usually, it is established legally by a government body according to the planning laws.

- c. Zoning, subdivision and construction controls --- The major tools for controlling land development and building construction in planning implementation are zoning ordinances, subdivision regulations and a set of codes concerning regulations, inspections and enforcements of building, plumbing, electrical and fire protection. A zoning map and proposed zoning ordinance should be prepared to guide the proper land usage in the project area.
- d. Designated development projects --- These are the action projects to be executed in the planning implementation for the tourism development in this project area.

B. ORGANIZATION OF PLANNING PROGRAM

Organization of the work program includes three components: work scope, time period and work force. Usually, in a development project, work scope and time period are determined as the requirements, then the third component -- work force can be easily determined to meet the need of work scope in the designated time period. As these basic components are determined, time scheduling, personnel arrangement and fiscal analysis can be organized in the planning program (FIGURE-13). For the tourism development project in Hengchun Peninsula, the planning work scope, desired time period, personnel arrangement and fiscal analysis in the planning program organization will be discussed separately in this section.

FIGURE-13 TOTAL PLANNING ORGANIZATION FLOW CHART



1. total work scope

On the basis of work analysis in each phase of planning process, the total work scope in the program of Hengchun Peninsula tourism development project can be listed as follows:

a. Formulation of planning program

- (1) Planning proposal
- (2) Planning work program
- (3) Planning organization

b. Background studies

- (1) Survey
 - (a) Users and markets survey
 - (b) Land ownership and developers survey
 - (c) Land use survey
 - (d) Visual survey
- (2) Data collection
 - (a) Area environment data
 - (b) Zone-attraction detail data
- (3) Analysis and projection

c. Creation of development concept

- (1) Synthesis and conclusions
- (2) Environment program and concept development
 - (a) Area program and concept
 - (b) Zone-attraction development concept
- (3) Cost-benefit analysis of alternative concepts

d. Development of overall plan

- (1) Regional and national relationship concept plan
- (2) Comprehensive plan

- (a) Land use plan
- (b) Transportation plan
- (c) Public facility plan
- (d) Scenic landscape plan
- (3) Designated zone-attraction projects
 - (a) Development zone-attraction project
 - (b) Redevelopment zone-attraction project
 - (c) Community development project
- e. Preparation for planning implementation
 - (1) Capital program
 - (2) Planning authority
 - (3) Zoning, subdivision and construction controls
 - (4) Executive development projects

2. Time period designated

The total work period for the accomplishment of total work scope listed above in this project is suggested to be one year. Work time period needed for each phase of planning process is designated as follows:

Phase-1 Formulation of program	10%
Phase-2 Undertaking background studies	30%
Phase-3 Creation of development concept	10%
Phase-4 Development of overall plan	30%
Phase-5 Preparation for planning implementation	20%

3. Personnel arrangement

Based on work analysis in each phase of planning process,

a planning team consisting of different kinds of professional consultants and specialists is called for the accomplishment of the total work in the tourism development of Hengchun Peninsula. The following table is an arrangement on personnel organization in each phase of planning process:

a. Formulation of planning program

Planners

Government officials

Representatives of related organizations

Investors

Land owners

b. Background studies

Planners

Urban designers

Landscape architects

Human behavior specialists

Marketing specialists

Economists

Sociologists

Geographers

c. Creation of development concept

Planners

Politicians

Urban designers

Scientists

Landscape architects

Marketing specialists

Economists

Investors and promoters

d. Development of overall plan

Planners

Sociologists

Urban designers	Scientists
Landscapr architects	Economists
Architects	Investors and promoters

e. Preparation for planning implementation

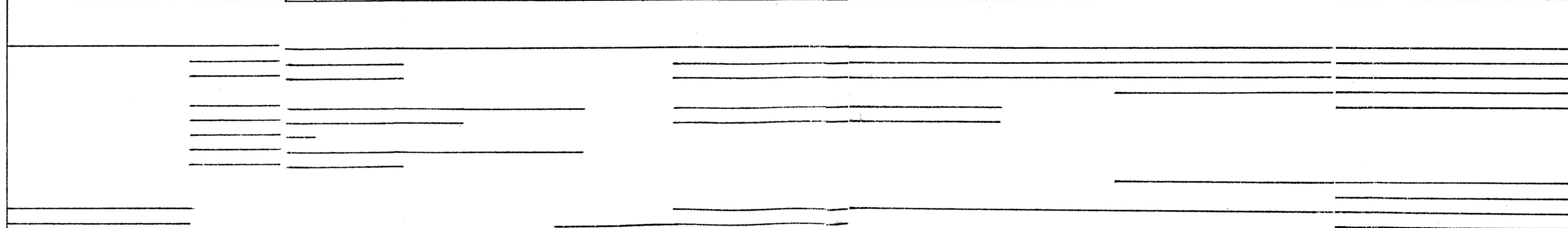
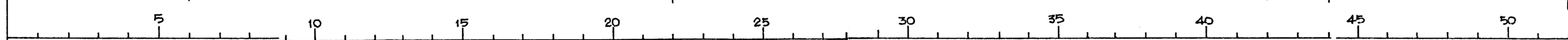
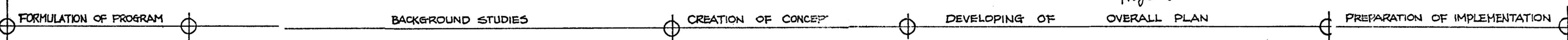
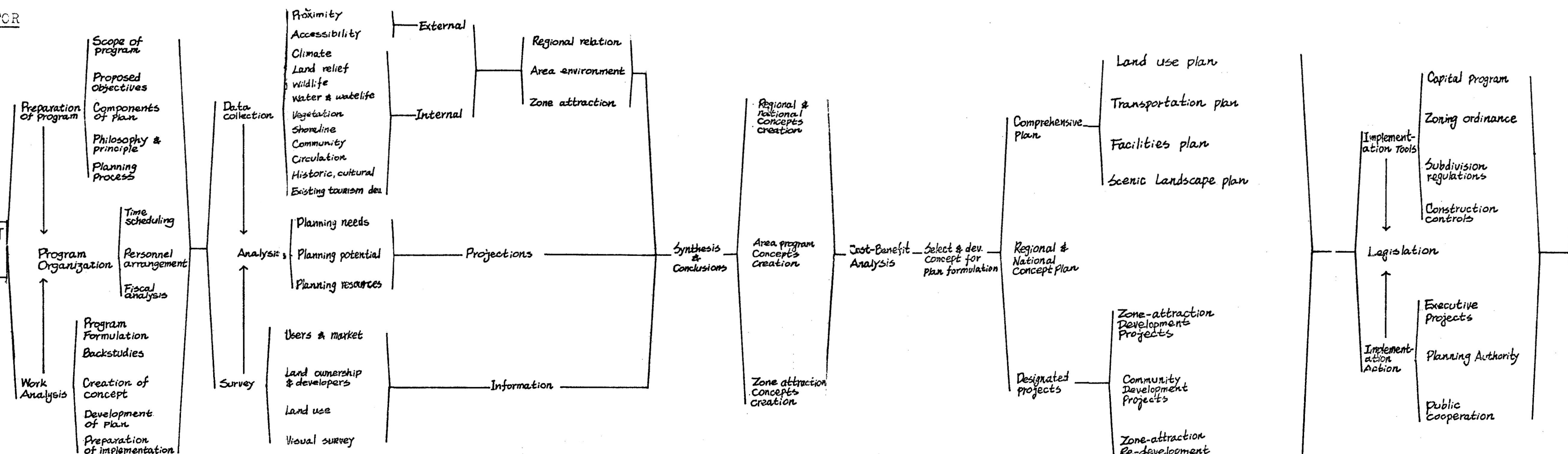
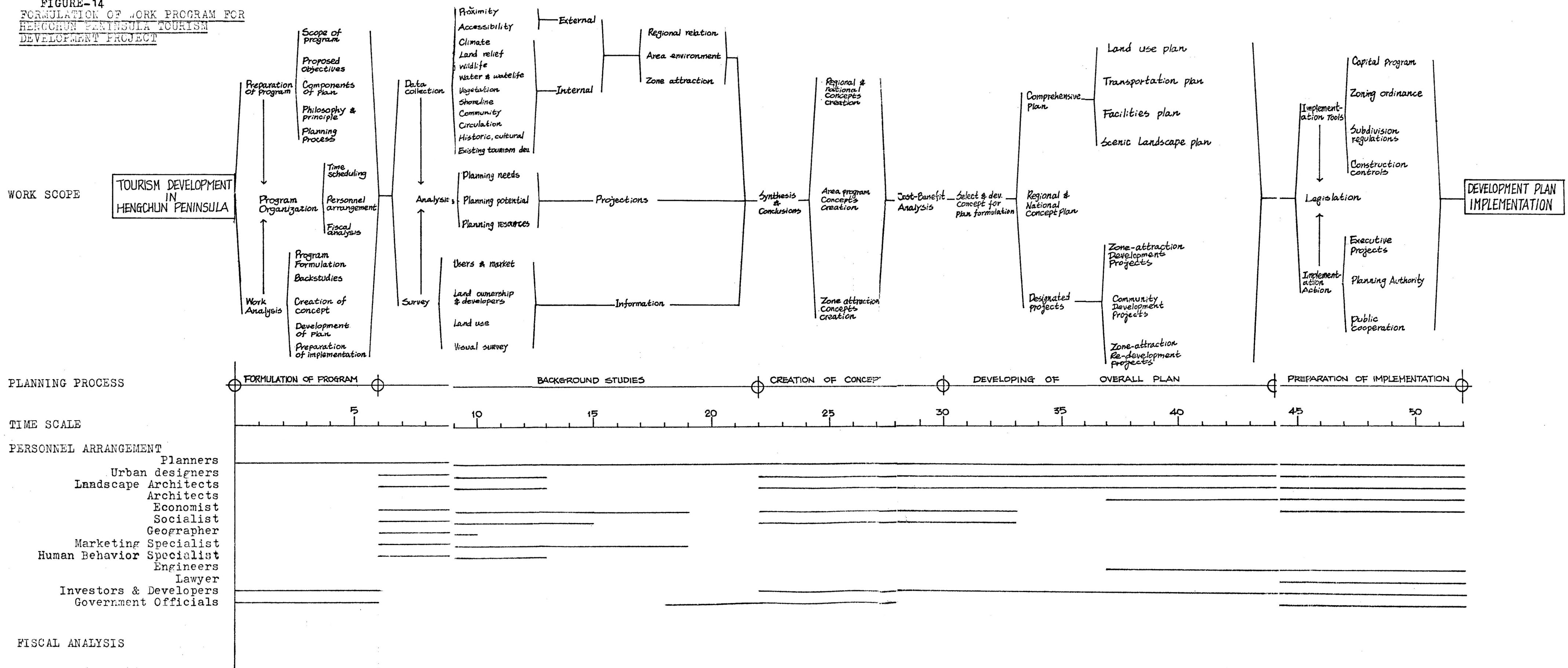
Planners	Lawyers
Urban designers	Economists
Landscape architects	Government officials
Architects	Investors and promoters

4. Fiscal analysis

The expenses for working out the total works involved in the planning program of this project will be listed as follows:

- a. Salaries --- These are the major portion of the total expenses in carrying out the total works in the program. The rate unit of the salaries would be suggested to be on a "man-week" unit base.
- b. Consultant fees --- The expenses of the independent jobs carried by consultants would be clasified as the consultant fees. These would be suggested to be paid on "job" unit.
- c. Maintenance of planning office --- This includes the staff members such as assistants, secreataries, typists; the rent, the furniture and the instruments.
- d. Transportation and communication costs --- This includes all the necessary expenses on transportation and communication with related organizations, governments, individuals.

FIGURE-14
FORMULATION OF WORK PROGRAM FOR
HENGCHUN PENINSULA TOURISM
DEVELOPMENT PROJECT



CHAPTER V
NETWORK DIAGRAM FORMULATION
AND RECOMENDED MANAGEMENT

Urban and regional planning typically involves a complex work program extending over a lengthy period of time. Some program, in fact, never actually come to an end but are on-going. They are usually described in term of a number of steps or projects. Each step is normally inter-related to the others and must be performed in sequence, either because of the logic of planning process or because of the requirements of the project. The techniques for the planning, controlling and scheduling of such lengthy and complex tasks have been available for many years. These techniques have been borrowed from industrial engineering applications. The principle concern of these methods is to find what is the best way to schedule all the jobs in a project to meet a designated date at minimum cost, and to demonstrate the jobs which effect the total project time period critically.

It is suggested to formulation a network diagram for the total planning program established previously and to apply the scientific techniques in the management of this planning program. In this chapter, these two suggestions will be discussed.

A. METHODOLOGY OF NETWORK DIAGRAM FORMULATION

The formulation of network diagram includes four steps:

Step-1 Work breakdown structure

The first step in approaching a major program is to divide or break the program into a number of constituent projects, each of which must be completed before the whole program can be considered finished. This type of breakdown may be considered analogous to the work explosion method. Two aspects of breakdowns may be noted at this stage:

- a. End objectives must be carefully defined in the beginning.
- b. Breakdowns should produce a series of accomplishable jobs, each of which may add the element of satisfaction that is to be derived from a task completed.

Step-2 Master phasing chart

Master phasing charts and a task matrix are ready to be prepared once the constituent projects have been recognized. The phasing charts consist of an outline of the whole program. It will be noted that the total program is phased into projects and that each project is phased as a series of tasks. Milestones and interfaces are shown in the phasing charts and carried down to the lowest level of detail.

Step-3 Network and activity lists

The use of network, event and activity lists is not essential to the network diagram. However, as additional aids, they ensure that nothing important is omitted from the network and they speed up the process. The event list is of great impor-

tance in identifying areas of uncertainty, particularly where an event is of the interface type. Both the event and the activity lists are working lists designed to eliminate continual revisions as the network is developed and to prove out the logic of the sequencing envisaged.

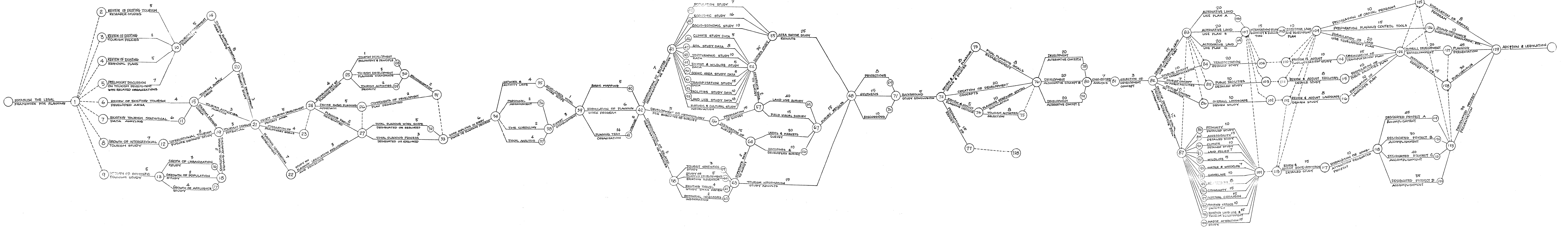
Step-4 Preparing the network diagram

The detailed preparation of a network diagram can be carried out in two ways. The network can be plotted by starting at the beginning and proceeding forward chronologically. Alternatively, the network can be plotted by starting with the deliverable end product and working backwards. Either method produces valid networks. Planning resulting network should read sequentially from left to right.

B. FORMULATION OF PROGRAM NETWORK DIAGRAM FOR HENGCHUN PROJECT

According to the method described above, the program network diagram has been formulated in FIGURE-15. The duration of each detailed work is estimated on a "man-day" scale. By using the computer calculation on CPM, the results are shown in APPENDIX-E.

FIGURE-15 PROPOSED PROGRAM NETWORK DIAGRAM



C. NETWORK DIAGRAM MANAGEMENT

In the management of network diagram, two variants are most commonly used: they are PERT (Periodic Evaluation and Review Technique) and CPM (Critical Path Method).

PERT involves the periodic evaluation and review of the progress being made in each job within a major project. At certain stages, known as milestones, a number of key elements may be started on time. The early identification of problem areas, and the recognition of where and when resources must be reallocated to keep a project on schedule, are of obvious importance to the project management. CPM involves a recognition that during the progress of a project, one specific sequence of events may be critical to keeping the whole project on schedule, both in terms of time and cost. The mathematic formulation on CPM equations is shown in APPENDIX-D.

These sophisticated techniques for the planning, scheduling and controlling of a complex program have a number of important implications for urban and regional planning:

1. They provide a means of plotting out in advance how a program is to be accomplished with accuracy and realism.
2. They detail the steps involved, the sequence in which each can best be performed, and the inter-dependencies that must be recognized.
3. They allow an evaluation to be made, in advance, of the time and costs involved to complete the program under alternative allocations of resources and completion date.

4. They indicate how a variety of professions, departments and agencies may be coordinated when the efforts of each depend upon and influence those of others.
5. They focus attention on small subset of critical jobs along the "bottleneck" path through the program on time/cost estimates, on other critical jobs, and on completion date.
6. They produce useful information all the way through the project from initial planning to final preparation so that control may be effective, as well as providing a permanent record of how the project was completed.
7. They may be required of consultants when making a submission to insure that a complete job will be done and that fees can be related to specific accomplishment.

Perhaps the most significant implication for the planning is that the use of network diagram provides an added tool by which the planner may illustrate to others who are not fully familiar with all the methods of planning:

- a. What adoption of a particular program involves in the way of research and special studies.
- b. What relationships exist between a planning program and other studies, such as traffic studies, facility studies, etc.
- c. What the consequences will be if certain steps are omitted or if specific studies are deleted.

CONCLUDING REMARKS

Tourism development planning exemplifies the concept of a multi-disciplinary field of study. Involved in this study are commerce and industry; national and international trade; local, regional and national economy; governmental policies and political influences; urban and rural society; physical and socio-economic factors; cultural and historic factors; as well as man-made and natural environment. In attempting to formulate a tourism development plan, the planning work should be accompanied by corresponding research, design, capital improvements, gradual improvements, regular maintenance and rational exploitation.

The planning approach for preparing the overall development plan in Hengchun Peninsula of Taiwan would be based on the principle of evaluation and balance wherein the Peninsula would be conceived as an organic whole with its parts in a balance relationship. A planning work program is necessary for the team approach to successfully carry out the tourism development plan in this area.

The planning program plays an important role in the practical planning project as it functions as:

1. A basic framework of total work in project;
2. A general guide of carrying out the project;
3. An outline of work to show the corresponding jobs;
4. A tool to be easily managed and controlled.

The preparation of a network can be considered as an

excellent opportunity to acquaint the people with the flow of work which is essential and desirable in the preparation of any plan. The program network diagram provides a tool to reduce a project to a set of milestones and tasks arranged in logic sequence, to draw up a schedule in terms of time and man-power inputs, and to manage the total process of the project.

This report can be used as a reference for the planner in preparing the planning program before the project is carried out for any kind of development planning, and in working on the development project related to tourism or recreation.

APPENDICES

APPENDIX-A

DEFINITION OF TOURISTS

The following persons are considered as tourists:

- a) Persons travelling for pleasure, for family reason, for health, etc.;
- b) Persons travelling to meetings, or in a representative capacity of any kind (scientific, administrative, diplomatic, religious, athletic, etc.);
- c) Persons travelling for business;
- d) Person arriving in course of a cruise, even when they stay less than 24 hours (The letter should be reckoned as a separate group, disregarding if necessary their usual place of residence.)

Source: Organization for Economic Cooperation and Development (OECD), TOURISM: IN OECD MEMBER COUNTRY 1969, P. 1-3.

APPENDIX-B "YIN" and "YANG" Philosophy

"YIN and YANG" are, in Chinese philosophy, the two guiding orders of the Almighty; they are the couple representing the soul and breath of all beings. These two, generally, represent the female and male souls of the universe, respectively. Thus, all life of the universe, including people and nature, comes from the composition of YIN and YANG.

To the Chinese, all of nature is alive with influences for good and evil. The course of a stream, the trend of a mountain, the position of a pagoda or pavilion, the curve of a road, the site of a temple or a grave, the location of settlement --- all these and many other things are, to the initiated eye, visible indication of nature's future actions. Thus, any element placed by man on the landscape must harmonize perfectly with the physical environment. This is an application of YIN and YANG principle.

This duality of opposites has been clearly expressed in the relationship between the Chinese house and garden, and in extension, the city and park. The theory of building a city or a house was based on Confucian idea -- formality, symmetry, clarity, straight lines, regular forms, a strict order of human creation -- which is YANG, representing man-made elements. The approach of designing a park or a garden was guided by Taoist conceptions -- informality, asymmetry, mystery, curved lines, irregular or romantic forms, a deep and persistent feeling for wild nature -- which is YIN, representing natural features.

The Chinese character " " which means "concave" belongs to the YIN complex. The corresponding shape as the Chinese character " " which means "convex" and belongs to the YANG complex. The table bellow is a list of examples of YIN and YANG composition:

YIN Component	YANG Component
Female	Male
Soul	Body
Passive	Active
Negative	Positive
Concave	Convex
Curve	Straight
Informal	Formal
Water	Mountain
Moon	Sun
Country	City
Garden	House

FIGURE-16a is a general graphic representing YIN and YANG principle in China. FIGURE-16b, 16c, 16d are some examples in graphic as YIN and YANG composition.

FIGURE-16 BALANCE PHILOSOPHY GRAPHIC INDICATION

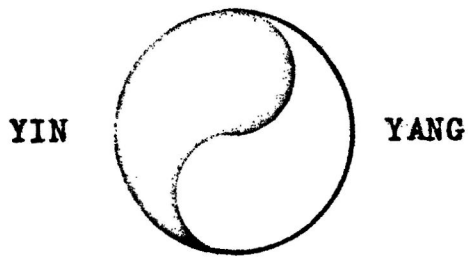


FIGURE-16a

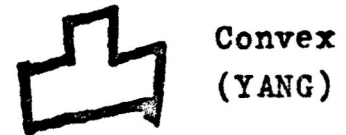
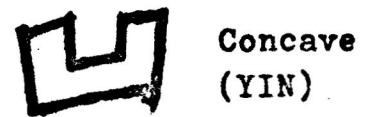


FIGURE-16b

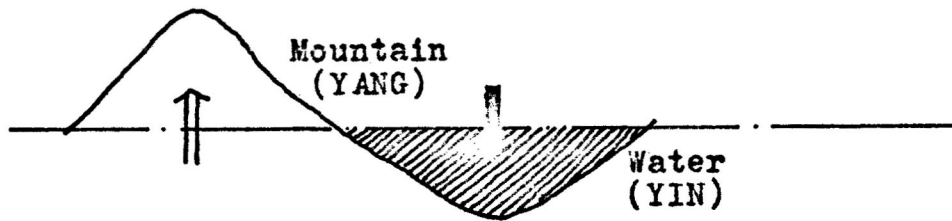


FIGURE-16c

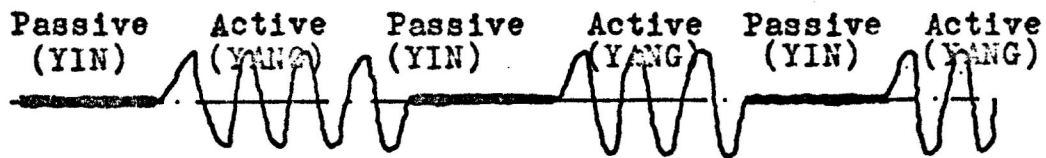


FIGURE-16d

APPENDIX-C

FACTORS AFFECTING THE GROWTH AND DEMAND OF TOURISM/RECREATION

The factors affecting demand for recreation/tourism facilities can be grouped into two general categories: Socio-economic characteristics of the population, and the physical attributes of the facilities themselves.

A. Physical factors

1. Time-distance required to make the vacation trip or travel to the recreational facilities.
2. The mix of activity-possibilities available at a recreation site or during a given vacation trip.
3. The degree of congestion at the recreation site.

B. Socio-economic factors

The Outdoor Recreation Resources Review Commission sponsored a survey in November, 1959, and May, 1960 of the leisure-time activities of American adults. The two sets of socio-economic categories are listed in TABLE-4.

TABLE-4

SOCIO-ECONOMIC CHARACTERISTICS RELEVANT TO PARTICIPATION IN RECREATION/TOURISM

Survey Research Center (ORRRC Study Report 20)	National Recreation Survey (ORRRC Study Report 19)
<u>Family Income</u> Under \$3,000 \$3,000 - 4,999 \$5,000 - 7,499 \$7,500 - 9,999 \$10,000 - and over	<u>Family Income</u> Less than \$1,500 \$1,500 - 2,999 \$3,000 - 4,499 \$4,500 - 5,999 \$6,000 - 7,999 \$8,000 - 9,999 \$10,000 - 14,999 \$15,000 and over
<u>Education of Family Head</u> Grade School, none; Some High School Completed High School; some college Has college degree	<u>Education, age 25 or over</u> 4 years or less; 5-7 years; 8 years High School 1-3 years; High School 4 years College 1-3 years; College 4 years or more
<u>Occupation of Family Head</u> Professional: Managers, Officials Sales Personnel, Clerical, Craftsmen Laborers, Service Workers Farm Operators	<u>All Employed, 14 and over</u> Professional, technical and kindred workers Managers, officials and proprietors, except farm. Clerical and sales workers (other white collar). Craftsmen, foremen and kind- red workers. Operatives and kindred workers, laborers, service workers (including private) Farm workers.
<u>Place of Residence</u> Cities: Suburban areas; adjacent areas: Outlying areas	<u>Place of Residence</u> Urban in SMSA: over 1 million Urban in SMSA: under 1 million Urban not in SMSA: Rural (SMSA = Standard Metropolitan Statistical Area as developed by the Census Bureau.)
<u>Age of Family Head</u> 18-24: 25-34: 35-44: 45-54 55-64: 65 and over	<u>Age</u> 12-17; 18-24; 25-44; 45-64; 65 and over
<u>Region</u> West, North Central, Northeast, South	<u>Major Region</u> West, North Central, Northeast, South
<u>Sex</u> Male, Female	<u>Sex</u> Male, Female
<u>Life Cycle</u> Single adult under 45; Married, under 45, no children; Married with children over 4-1/2 and under 18; Married, over 45, no children; Single adult over 45; Other	<u>Physical Impairments</u> No impairments. Impairments not limiting. Limiting impairments <u>State of Health</u> Excellent; Good; Fair; Poor
<u>Race</u> White; Negro	Not considered
<u>Paid Vacation of Family Head</u> None; 1 week; 2 weeks; 3 weeks; 4 weeks or over. Self-employed. Not in labor force.	Not considered

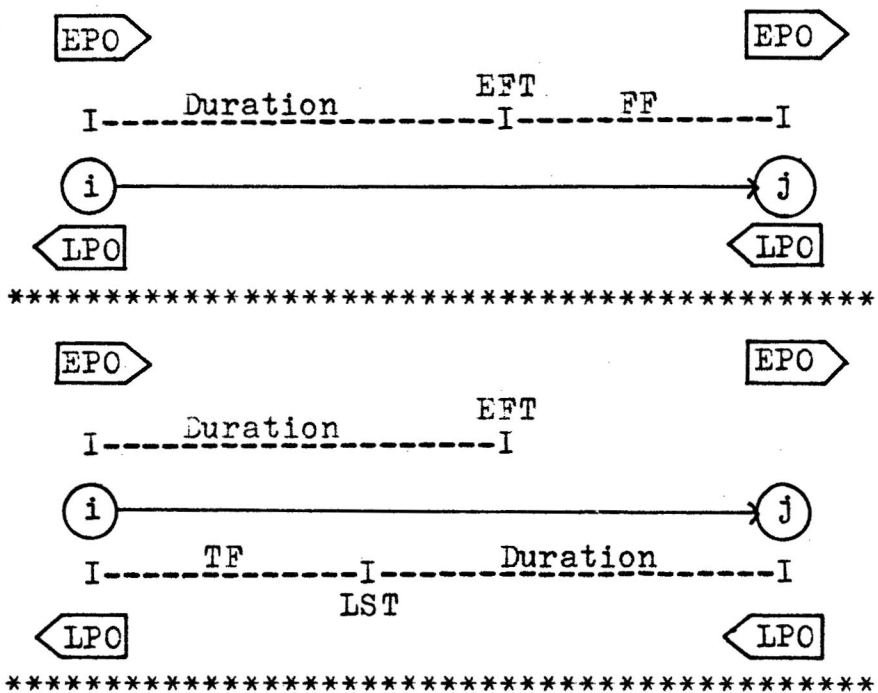
Sources: Participation in Outdoor Recreation: Factors Affecting Demand
Among American Adults, ORRRC Study Report 20, (Left-hand column).
National Recreation Survey, ORRRC Study Report 19, (Right-hand column).

APPENDIX-D Introduction of CPM Management

- * The Earliest Possible Occurrence (EPO) of a node (event) is the earliest possible time for starting all arrows (operations) that originate at that node(event).
- * The Earliest Finish Time (EFT) of an operation is the sum of the EPO of the node at the start of the operation plus the duration of the operation. If there are more than one operation, choose the maximum.
- * The Latest Possible Occurrence (LPO) of a node (event) is the latest possible time that all of the operations that terminate at that event can finish without causing the project duration to exceed the value originally calculated with the EPO's.
- * The Latest Start Time (LST) of an operation is the LPO of the node at which it terminates minus its duration.
- * The Free Float (FF) of an operation is the difference between its EFT and EPO of the node at which it terminates. Free Float of an operation is the amount of time that the operation can be delay or lengthened without affecting the EPO of any node on the diagram.
- * The Total Float(TF) is numerically equal to the LST of an operation minus the EST of the same operation. Total Float is the length of time that an operation can be delayed or expanded without affecting the completion time of the project.

CPM MATHEMATICAL EQUATION FORMULATION

FIGURE-17 Graphic Indications



EST = EPO (begining node)

EFT = EPO (begining node) + Duration -----Maximum

LST = LPO (terminal node) - Duration -----Minimum

LFT = LPO (terminal node)

FF = EPO (terminal node) - EFT

TF = LST - EST

APPENDIX-E Computer Calculation of CPM on Program Network
Diagram (FIGURE-15)

```

//RCL05096 JOB (XXXXXXXX,4,9),*CHENG*,MSGLEVEL=1,CLASS=D          JOB 874
//      EXEC WATFIV
XXGO      EXEC PGM=WATFIV          00001000
XXSTEPLIB DD DSN=SYS1.XMONITOR,DISP=SHR          00002000
XXSYSPRINT DD SYSOUT=A          00003000
XXWATLIB DD DSN=SYS1.WATFIV.FUNLIB,DISP=SHR      00004000
XX      DD DSN=SYS1.WATFIV.WATLIB,DISP=SHR      00005000
XXWATERRS DD DSN=SYS1.WATFIV.FRRTEXTS,DISP=SHR  00006000
XXFT01F001 DD SPACE=(TRK,(1,1)),DCB=(RECFM=VS,BLKSIZE=256),UNIT=SYSDA 00007000
XXFT02F001 DD SPACE=(TRK,(1,1)),DCB=(RECFM=VS,BLKSIZE=256),UNIT=SYSDA 00008000
XXFT05F001 DD DCNAME=SYSIN          00009000
XXFT06F001 DD SYSOUT=A          00010000
XXFT07F001 DD SYSOUT=B,DCB=BUFA0=1          00011000
//GC.SYSIN DD *
//

```

```

IEF236I ALLOC. FOR RCL05096 GO
IEF237I 132 ALLOCATED TO STEPLIB
IEF237I 05E ALLOCATED TO SYSPRINT
IEF237I 132 ALLOCATED TO WATLIB
IEF237I 132 ALLOCATED TO
IEF237I 132 ALLOCATED TO WATERRS
IEF237I 131 ALLOCATED TO FT01F001
IEF237I 131 ALLOCATED TO FT02F001
IEF237I 04C ALLOCATED TO FT05F001
IEF237I 04F ALLOCATED TO FT06F001
IEF237I 04D ALLOCATED TO FT07F001
IEF235I SYS1.XMONITOR KEPT
IEF235I VOL SER NOS= LIRPAK.
IEF235I SYS1.WATFIV.FUNLIB KEPT
IEF235I VOL SER NOS= LIRPAK.
IEF235I SYS1.WATFIV.WATLIB KEPT
IEF235I VOL SER NOS= LIRPAK.
IEF235I SYS1.WATFIV.FRRTEXTS KEPT
IEF235I VOL SER NOS= LIRPAK.
IEF235I SYS73163.T000618.RF000.RCL05096.R0000368 DELETED
IEF235I VOL SER NOS= LNKVCL.
IEF235I SYS73163.T000618.RF000.RCL05096.R0000369 DELETED
IEF235I VOL SER NOS= LNKVCL.

```

```

KSU003I PARTITION SIZE = 256K, MAXIMUM CCRF USED = 256K, TIME = 00.09.58
KSU004I I/O COUNT -- DISK = 0 TAPE = 0
KSU001I STEP 1 GO EXECUTION TIME = .021 HRS. RETURN CODE = 0

```

```

KSU002I JOB RCL05096 EXECUTION TIME = .021 HRS.

```

```


```

HASP-II V3.1 JOB STATISTICS -- 302 CARDS READ -- 360 LINES PRINTED -- 0 CARDS PUNCHED -- COPY 1 OF 1

```


```

```


```

```

$JOB      RWH,RUN=CHECK,TIME=30,PAGES=55,KP=29
C         CRITICAL PATH PROGRAM 1973 FORTRAN IV
C         PREPARED FOR PROPOSED PLANNING PROGRAM IN HENGCHUN TOURISM DEVELOPMENT
1         DIMENSION NUM(900),J(800),I(800),L(800),TE(800),D(800)
2         5  FORMAT(13)
3         510 FORMAT(13,5X,13,1X,13,F9.2)
4         515 FORMAT('1',60HPROPOSED PLANNING PROGRAM FOR FORMULATING TOURISM DE
5         520 FORMAT(13X,24HCRITICAL PATH SCHEDULING,/)
6         530 FORMAT(55H NO. 1 J D ESD LSC EFD LFD TF FF,
7         1/)
8         540 FORMAT(1X,314,7F6.1)
9         550 FORMAT('1',314,7F6.1,15H *CRITICAL PATH)
10        570 FORMAT(13X,43H ACTIVITIES ON CRITICAL PATH INDICATED BY *)
11        1  READ 5,M
12        DO 100 K=1,M
13        READ 510,NUM(K),I(K),J(K),D(K)
14        TE(1)=0.0
15        IF(2)=0.0
16        K2=2
17        K3=1
18        DO 10 N=1,M
19        KI=N
20        IF(J(N)-K2)10,50,10
21        K3=1
22        K4=I(K1)
23        TT=TE(K4)+D(K1)
24        IF(TE(K2)-TT)51,10,10
25        51  TE(K2)=TT
26        10  CONTINUE
27        IF(K3)11,20,11
28        K2=K2+1
29        K3=0
30        TE(K2)=0.0
31        GO TO 9
32        20  K2=K2-2
33        TL(K2+1)=TE(K2+1)
34        NUMN=K2+1
35        TL(N2)=TL(K2+1)
36        DO 15 N1=1,M
37        K1=N1
38        IF(I(N1)-K2)15,30,15
39        K4=J(K1)
40        TT=TL(K4)-D(K1)
41        IF(TT-TL(K2))31,15,15
42        31  TL(K2)=TT
43        15  CONTINUE
44        IF(K2-1)16,60,16
45        K2=K2-1
46        TL(K2)=TL(NUMN)
47        GO TO 14
48        60  PRINT 515
49        PRINT 520
50        PRINT 530
51        TOTO=0.0
52        DO 65 N2=1,M
53        K1=J(N2)
54        K2=I(N2)
55        ESD=TE(K2)
56        EFD=ESD+D(N2)

```

```
56      FLFD=TL(K1)
57      FLSD=FLFD-D(N2)
58      TF=TL(K1)-TF(K2)-D(N2)
59      FF=TF(K1)-TE(K2)-D(N2)
60      IF(TF)240,250,240
61      240 PRINT 540,NUM(N2),K2,K1,D(N2),ESD,FLSD,EFD,FLFD,TF,FF
62      GO TO 65
63      250 PRINT 550, NUM(N2),K2,K1,D(N2),ESD,FLSD,EFD,FLFD,TF,FF
64      IF(FLFD-TOTD)65,65,66
65      66 TOTD=FLFD
66      65 CONTINUE
67      PRINT 57C
68      STOP
69      END
```

SENTRY

PROPOSED PLANNING PROGRAM FOR FORMULATING TOURISM DEVELOPMENT PLAN
IN HENGCHUN PENINSULA, TAIWAN

CRITICAL PATH SCHEDULING

NO.	I	J	D	ESD	LSD	FFD	LFD	TF	FF
1	1	2	0.0	0.0	2.0	0.0	2.0	2.0	0.0
2	1	3	0.0	0.0	5.0	0.0	5.0	5.0	0.0
3	1	4	0.0	0.0	2.0	0.0	2.0	2.0	0.0
4	1	5	0.0	0.0	0.0	0.0	0.0	0.0	*CRITICAL PATH
5	1	6	0.0	0.0	15.0	0.0	15.0	15.0	0.0
6	1	7	0.0	0.0	13.0	0.0	13.0	13.0	0.0
7	1	8	0.0	0.0	11.0	0.0	11.0	11.0	0.0
8	1	9	0.0	0.0	9.0	0.0	9.0	9.0	0.0
9	2	10	5.0	0.0	7.0	5.0	7.0	2.0	2.0
10	3	10	2.0	0.0	5.0	2.0	7.0	5.0	5.0
11	4	10	5.0	0.0	2.0	5.0	7.0	2.0	2.0
12	5	10	7.0	0.0	0.0	7.0	7.0	0.0	*CRITICAL PATH
13	6	15	4.0	0.0	15.0	4.0	19.0	15.0	2.0
14	7	11	6.0	0.0	13.0	6.0	19.0	13.0	0.0
15	8	12	7.0	0.0	11.0	7.0	18.0	11.0	0.0
16	9	13	5.0	0.0	9.0	5.0	14.0	9.0	0.0
17	10	14	5.0	7.0	7.0	12.0	12.0	0.0	*CRITICAL PATH
18	11	15	0.0	6.0	19.0	6.0	19.0	13.0	0.0
19	12	19	2.0	7.0	18.0	9.0	20.0	11.0	2.0
20	13	16	3.0	5.0	15.0	8.0	18.0	10.0	0.0
21	13	17	4.0	5.0	14.0	9.0	18.0	9.0	0.0
22	13	18	2.0	5.0	16.0	7.0	18.0	11.0	2.0
23	14	20	5.0	12.0	12.0	20.0	20.0	0.0	*CRITICAL PATH
24	15	19	1.0	6.0	19.0	7.0	20.0	13.0	4.0
25	15	20	1.0	6.0	19.0	7.0	20.0	13.0	13.0
26	15	21	3.0	6.0	20.0	9.0	23.0	14.0	14.0
27	16	18	0.0	5.0	18.0	8.0	18.0	10.0	1.0
28	17	18	0.0	9.0	18.0	9.0	18.0	9.0	0.0
29	18	19	2.0	9.0	13.0	11.0	20.0	9.0	0.0
30	19	21	3.0	11.0	20.0	14.0	23.0	9.0	9.0
31	20	21	3.0	20.0	20.0	23.0	23.0	0.0	*CRITICAL PATH
32	21	22	7.0	23.0	23.0	30.0	30.0	0.0	*CRITICAL PATH
33	21	23	4.0	23.0	24.0	27.0	28.0	1.0	0.0
34	21	24	5.0	23.0	23.0	28.0	23.0	9.0	0.0
35	22	27	3.0	30.0	30.0	33.0	33.0	0.0	*CRITICAL PATH
36	23	24	0.0	27.0	28.0	27.0	28.0	1.0	1.0
37	24	25	4.0	28.0	29.0	32.0	33.0	1.0	0.0
38	24	25	5.0	28.0	23.0	33.0	33.0	0.0	*CRITICAL PATH
39	24	27	2.0	28.0	31.0	30.0	33.0	3.0	3.0
40	25	28	1.0	32.0	35.0	33.0	36.0	3.0	0.0
41	25	29	2.0	32.0	34.0	34.0	36.0	2.0	0.0
42	25	30	3.0	32.0	33.0	35.0	36.0	1.0	0.0
43	26	27	0.0	33.0	33.0	33.0	33.0	0.0	*CRITICAL PATH
44	26	31	2.0	33.0	36.0	35.0	38.0	3.0	2.0
45	27	32	5.0	33.0	33.0	38.0	38.0	0.0	*CRITICAL PATH
46	27	33	3.0	33.0	35.0	36.0	38.0	2.0	2.0
47	28	30	0.0	33.0	36.0	33.0	36.0	3.0	2.0
48	29	30	0.0	34.0	36.0	34.0	36.0	2.0	1.0
49	30	31	2.0	35.0	36.0	37.0	38.0	1.0	0.0
50	31	33	0.0	37.0	38.0	37.0	38.0	1.0	1.0
51	32	33	0.0	38.0	38.0	38.0	38.0	0.0	*CRITICAL PATH

52	33	34	6.0	38.0	38.0	44.0	44.0	0.0	0.0	*CRITICAL PATH
53	34	35	4.0	44.0	45.0	48.0	50.0	2.0	0.0	
54	34	36	2.0	44.0	46.0	46.0	48.0	2.0	0.0	
55	34	37	4.0	44.0	44.0	48.0	48.0	0.0	0.0	*CRITICAL PATH
56	34	38	2.0	44.0	46.0	46.0	48.0	2.0	2.0	
57	35	39	1.0	48.0	50.0	49.0	51.0	2.0	2.0	
58	36	39	0.0	46.0	43.0	46.0	48.0	2.0	2.0	
59	37	38	0.0	43.0	43.0	48.0	48.0	0.0	0.0	*CRITICAL PATH
60	33	39	3.0	43.0	48.0	51.0	51.0	0.0	0.0	*CRITICAL PATH
61	39	40	5.0	51.0	62.0	56.0	67.0	11.0	0.0	
62	39	41	14.0	51.0	51.0	65.0	65.0	0.0	0.0	*CRITICAL PATH
63	39	42	6.0	51.0	61.0	57.0	67.0	10.0	10.0	
64	40	42	0.0	56.0	67.0	56.0	67.0	11.0	11.0	
65	41	47	7.0	65.0	65.0	67.0	67.0	0.0	0.0	*CRITICAL PATH
66	42	43	7.0	67.0	67.0	74.0	74.0	0.0	0.0	*CRITICAL PATH
67	42	56	5.0	67.0	77.0	72.0	82.0	10.0	0.0	
68	42	58	5.0	67.0	95.0	72.0	100.0	28.0	0.0	
69	43	44	0.0	74.0	120.0	74.0	120.0	46.0	0.0	
70	43	45	0.0	74.0	111.0	74.0	111.0	37.0	0.0	
71	43	46	0.0	74.0	87.0	74.0	87.0	13.0	0.0	
72	43	47	0.0	74.0	84.0	74.0	84.0	10.0	0.0	
73	43	43	0.0	74.0	82.0	74.0	82.0	8.0	0.0	
74	43	49	0.0	74.0	97.0	74.0	87.0	13.0	0.0	
75	43	50	0.0	74.0	81.0	74.0	97.0	13.0	0.0	
76	43	51	0.0	74.0	77.0	74.0	77.0	3.0	0.0	
77	43	52	0.0	74.0	82.0	74.0	82.0	8.0	0.0	
78	43	53	0.0	74.0	74.0	74.0	74.0	0.0	0.0	*CRITICAL PATH
79	43	54	7.0	74.0	85.0	81.0	92.0	11.0	11.0	
80	43	55	10.0	74.0	117.0	84.0	127.0	43.0	43.0	
81	44	55	7.0	74.0	120.0	81.0	127.0	46.0	46.0	
82	45	55	15.0	74.0	111.0	90.0	127.0	37.0	37.0	
83	45	54	5.0	74.0	87.0	79.0	92.0	13.0	13.0	
84	47	54	8.0	74.0	84.0	92.0	92.0	10.0	10.0	
85	48	54	10.0	74.0	82.0	84.0	92.0	8.0	8.0	
86	49	54	5.0	74.0	87.0	79.0	92.0	13.0	13.0	
87	50	54	5.0	74.0	87.0	79.0	92.0	13.0	13.0	
88	51	54	15.0	74.0	77.0	89.0	92.0	3.0	3.0	
89	52	54	10.0	74.0	82.0	84.0	92.0	8.0	8.0	
90	53	54	18.0	74.0	74.0	92.0	92.0	0.0	0.0	*CRITICAL PATH
91	54	55	35.0	92.0	92.0	127.0	127.0	0.0	0.0	*CRITICAL PATH
92	54	57	2.0	92.0	95.0	94.0	97.0	3.0	0.0	
93	55	68	25.0	127.0	127.0	152.0	152.0	0.0	0.0	*CRITICAL PATH
94	56	57	15.0	77.0	92.0	87.0	97.0	10.0	7.0	
95	56	64	15.0	72.0	92.0	87.0	107.0	20.0	0.0	
96	57	65	40.0	94.0	97.0	134.0	137.0	3.0	0.0	
97	57	67	15.0	94.0	122.0	109.0	137.0	28.0	25.0	
98	58	59	3.0	72.0	102.0	75.0	105.0	30.0	0.0	
99	53	60	5.0	72.0	100.0	77.0	105.0	28.0	0.0	
100	58	61	4.0	72.0	101.0	76.0	105.0	29.0	0.0	
101	53	62	2.0	72.0	101.0	74.0	105.0	31.0	0.0	
102	59	63	0.0	75.0	105.0	75.0	105.0	30.0	2.0	
103	60	63	0.0	77.0	105.0	77.0	105.0	28.0	0.0	
104	61	63	0.0	76.0	105.0	76.0	105.0	29.0	1.0	
105	62	63	0.0	74.0	105.0	74.0	105.0	31.0	3.0	
106	63	64	2.0	77.0	105.0	79.0	107.0	28.0	8.0	
107	63	68	15.0	77.0	137.0	92.0	152.0	60.0	60.0	
108	64	67	30.0	87.0	107.0	117.0	137.0	20.0	17.0	
109	64	66	10.0	87.0	127.0	97.0	137.0	40.0	0.0	
110	65	67	0.0	134.0	137.0	134.0	137.0	3.0	0.0	
111	66	67	0.0	97.0	137.0	97.0	137.0	40.0	37.0	

112	67	68	15.0	134.0	137.0	149.0	152.0	3.0	3.0	
113	68	69	8.0	152.0	157.0	160.0	165.0	5.0	0.0	
114	68	70	10.0	152.0	155.0	162.0	165.0	3.0	0.0	
115	69	71	15.0	152.0	152.0	167.0	167.0	0.0	0.0	*CRITICAL PATH
116	69	71	2.0	160.0	165.0	162.0	167.0	5.0	5.0	
117	70	71	2.0	162.0	165.0	164.0	167.0	3.0	3.0	
118	71	72	5.0	187.0	167.0	172.0	172.0	0.0	0.0	*CRITICAL PATH
119	72	73	8.0	172.0	176.0	180.0	184.0	4.0	0.0	
120	72	74	5.0	172.0	177.0	177.0	182.0	5.0	0.0	
121	72	76	20.0	172.0	172.0	192.0	192.0	0.0	0.0	*CRITICAL PATH
122	72	77	15.0	172.0	337.0	137.0	352.0	165.0	0.0	
123	73	76	8.0	180.0	184.0	188.0	192.0	4.0	4.0	
124	74	75	8.0	177.0	184.0	185.0	192.0	7.0	0.0	
125	74	76	10.0	177.0	182.0	187.0	192.0	5.0	5.0	
126	75	76	0.0	185.0	192.0	185.0	192.0	7.0	7.0	
127	75	78	20.0	192.0	192.0	212.0	212.0	0.0	0.0	*CRITICAL PATH
128	76	79	20.0	192.0	192.0	212.0	212.0	0.0	0.0	*CRITICAL PATH
129	76	80	20.0	192.0	192.0	212.0	212.0	0.0	0.0	*CRITICAL PATH
130	77	129	0.0	187.0	352.0	137.0	352.0	165.0	165.0	
131	78	80	0.0	212.0	212.0	212.0	212.0	0.0	0.0	*CRITICAL PATH
132	79	80	0.0	212.0	212.0	212.0	212.0	0.0	0.0	*CRITICAL PATH
133	80	81	7.0	212.0	212.0	219.0	219.0	0.0	0.0	*CRITICAL PATH
134	81	82	3.0	219.0	219.0	222.0	222.0	0.0	0.0	*CRITICAL PATH
135	82	83	15.0	222.0	222.0	237.0	237.0	0.0	0.0	*CRITICAL PATH
136	82	84	10.0	222.0	227.0	232.0	237.0	5.0	5.0	
137	82	85	7.0	222.0	240.0	229.0	247.0	13.0	8.0	
138	82	86	10.0	222.0	237.0	232.0	247.0	15.0	5.0	
139	82	87	15.0	222.0	227.0	237.0	242.0	5.0	0.0	
140	83	84	0.0	237.0	237.0	237.0	237.0	0.0	0.0	*CRITICAL PATH
141	83	85	0.0	237.0	247.0	237.0	247.0	10.0	0.0	
142	83	86	0.0	237.0	247.0	237.0	247.0	10.0	0.0	
143	83	87	0.0	237.0	247.0	237.0	247.0	5.0	0.0	
144	83	105	20.0	237.0	237.0	257.0	257.0	0.0	0.0	*CRITICAL PATH
145	83	106	20.0	237.0	237.0	257.0	257.0	0.0	0.0	*CRITICAL PATH
146	83	107	20.0	237.0	237.0	257.0	257.0	0.0	0.0	*CRITICAL PATH
147	84	104	20.0	237.0	237.0	257.0	257.0	0.0	0.0	*CRITICAL PATH
148	85	103	10.0	237.0	247.0	247.0	257.0	10.0	0.0	
149	86	102	10.0	237.0	247.0	247.0	257.0	10.0	0.0	
150	87	88	0.0	237.0	247.0	237.0	247.0	10.0	0.0	
151	87	89	0.0	237.0	242.0	237.0	242.0	5.0	0.0	
152	87	90	0.0	237.0	247.0	237.0	247.0	10.0	0.0	
153	87	91	0.0	237.0	250.0	237.0	250.0	13.0	0.0	
154	87	92	0.0	237.0	252.0	237.0	252.0	15.0	0.0	
155	87	93	0.0	237.0	250.0	237.0	250.0	13.0	0.0	
156	87	94	0.0	237.0	247.0	237.0	247.0	10.0	0.0	
157	87	95	0.0	237.0	249.0	237.0	249.0	12.0	0.0	
158	87	96	0.0	237.0	242.0	237.0	242.0	5.0	0.0	
159	87	97	0.0	237.0	242.0	237.0	242.0	5.0	0.0	
160	87	98	0.0	237.0	247.0	237.0	247.0	10.0	0.0	
161	87	99	0.0	237.0	242.0	237.0	242.0	5.0	0.0	
162	87	100	0.0	237.0	242.0	237.0	242.0	5.0	0.0	
163	88	101	10.0	237.0	247.0	247.0	257.0	10.0	5.0	
164	89	101	15.0	237.0	242.0	252.0	257.0	5.0	0.0	
165	90	101	10.0	237.0	247.0	247.0	257.0	10.0	5.0	
166	91	101	7.0	237.0	250.0	244.0	257.0	13.0	8.0	
167	92	101	5.0	237.0	252.0	242.0	257.0	15.0	10.0	
168	93	101	7.0	237.0	250.0	244.0	257.0	13.0	8.0	
169	94	101	10.0	237.0	247.0	247.0	257.0	10.0	5.0	
170	95	101	8.0	237.0	249.0	245.0	257.0	12.0	7.0	
171	96	101	15.0	237.0	242.0	252.0	257.0	5.0	0.0	

172	97	101	15.0	237.0	242.0	252.0	257.0	5.0	0.0	
173	97	101	10.0	237.0	247.0	247.0	257.0	10.0	5.0	
174	99	101	15.0	237.0	242.0	252.0	257.0	5.0	0.0	
175	100	101	15.0	237.0	242.0	252.0	257.0	5.0	0.0	
176	101	107	0.0	252.0	257.0	252.0	257.0	5.0	5.0	
177	101	113	0.0	252.0	282.0	252.0	282.0	30.0	30.0	
178	102	107	0.0	247.0	257.0	247.0	257.0	10.0	10.0	
179	102	112	0.0	247.0	299.0	247.0	299.0	52.0	35.0	
180	103	107	0.0	247.0	257.0	247.0	257.0	10.0	10.0	
181	103	111	0.0	247.0	299.0	247.0	299.0	52.0	35.0	
182	104	107	0.0	257.0	257.0	257.0	257.0	0.0	0.0	*CRITICAL PATH
183	104	110	0.0	257.0	292.0	257.0	292.0	35.0	25.0	
184	105	107	0.0	257.0	257.0	257.0	257.0	0.0	0.0	*CRITICAL PATH
185	106	107	0.0	257.0	257.0	257.0	257.0	0.0	0.0	*CRITICAL PATH
186	107	108	15.0	257.0	257.0	272.0	272.0	0.0	0.0	*CRITICAL PATH
187	109	109	10.0	272.0	272.0	282.0	282.0	0.0	0.0	*CRITICAL PATH
188	109	110	0.0	282.0	292.0	282.0	292.0	10.0	0.0	
189	109	111	0.0	282.0	299.0	282.0	299.0	17.0	0.0	
190	109	112	0.0	282.0	299.0	282.0	299.0	17.0	0.0	
191	109	113	0.0	282.0	282.0	282.0	282.0	0.0	0.0	*CRITICAL PATH
192	109	124	20.0	282.0	297.0	307.0	317.0	15.0	5.0	
193	109	125	10.0	282.0	364.0	297.0	374.0	82.0	60.0	
194	109	126	15.0	282.0	357.0	297.0	372.0	75.0	10.0	
195	110	114	10.0	282.0	292.0	292.0	302.0	10.0	0.0	
196	111	115	8.0	282.0	299.0	290.0	307.0	17.0	0.0	
197	112	116	8.0	282.0	299.0	290.0	307.0	17.0	0.0	
198	113	117	15.0	282.0	282.0	297.0	297.0	0.0	0.0	*CRITICAL PATH
199	114	124	15.0	292.0	302.0	307.0	317.0	10.0	0.0	
200	115	124	10.0	290.0	307.0	300.0	317.0	17.0	7.0	
201	116	124	10.0	290.0	307.0	300.0	317.0	17.0	7.0	
202	117	118	10.0	297.0	297.0	307.0	307.0	0.0	0.0	*CRITICAL PATH
203	118	119	45.0	307.0	307.0	352.0	352.0	0.0	0.0	*CRITICAL PATH
204	118	120	30.0	307.0	322.0	337.0	352.0	15.0	0.0	
205	113	121	40.0	307.0	312.0	347.0	352.0	5.0	0.0	
206	118	122	35.0	307.0	317.0	342.0	352.0	10.0	0.0	
207	119	123	0.0	352.0	352.0	352.0	352.0	0.0	0.0	*CRITICAL PATH
208	120	123	0.0	337.0	352.0	337.0	352.0	15.0	15.0	
209	121	123	0.0	347.0	352.0	347.0	352.0	5.0	5.0	
210	122	123	0.0	342.0	352.0	342.0	352.0	10.0	10.0	
211	123	125	0.0	352.0	374.0	352.0	374.0	22.0	0.0	
212	123	128	0.0	352.0	352.0	352.0	352.0	0.0	0.0	*CRITICAL PATH
213	123	129	30.0	352.0	352.0	382.0	382.0	0.0	0.0	*CRITICAL PATH
214	124	125	0.0	307.0	374.0	307.0	374.0	67.0	45.0	
215	124	126	0.0	307.0	372.0	307.0	372.0	65.0	0.0	
216	124	127	20.0	307.0	317.0	327.0	337.0	10.0	0.0	
217	124	128	15.0	307.0	337.0	322.0	352.0	30.0	30.0	
218	125	129	8.0	352.0	374.0	360.0	382.0	22.0	22.0	
219	126	129	10.0	307.0	372.0	317.0	382.0	65.0	65.0	
220	127	129	45.0	327.0	337.0	372.0	382.0	10.0	10.0	
221	123	129	30.0	352.0	352.0	382.0	382.0	0.0	0.0	*CRITICAL PATH

ACTIVITIES ON CRITICAL PATH INDICATED BY *

CORE USAGE OBJECT CODE= 2984 BYTES, ARRAY AREA= 19200 BYTES, TOTAL AREA AVAILABLE= 176352 BYTES

DIAGNOSTICS NUMBER OF ERRORS= 0, NUMBER OF WARNINGS= 0, NUMBER OF EXTENSIONS= 0

COMPILE TIME= 3.10 SEC, EXECUTION TIME= 84.09 SEC, WATFIV - VERSION 1 LEVEL 3 MARCH 1971 DATE= 7/7/163

DATE	JOB	ACCT	
12 JUN 73	RCL05096	FL02RFJ0	CHENG

TIME ON	00.06.23	RESIDENT TIME	3.63 MIN
PRINTED	00.32.51	EXECUTION TIME	1.26 MIN

CPU TIME	.021 HRS	\$2.52
(CLASS D, RATE = \$120/HR)		

302 CARDS READ	.1510 UNITS	
360 LINES PRINTED	.1800 UNITS	
9 PAGES PRINTED	.0240 UNITS	

TOTAL I/O	.3550 UNITS	\$0.36
(I/O RATE = \$1/UNIT)		

ACCOUNT BALANCE	\$219.86	TOTAL COST	\$2.88
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