

**FRAMEWORK FOR AN URBAN ACTION
STRATEGY**

SRI LANKA

Urban Development Authority

August 1990

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TABLE OF CONTENTS

PREFACE

EXECUTIVE SUMMARY

	Page
I. INTRODUCTION AND SCOPE	
A. Background	1
B. Scope	2
II. URBAN STRATEGY OBJECTIVES	5
A. Facilitate Devolution/Decentralization	5
B. Strengthen Urban Institutions	5
C. Improve Urban Resource Mobilization	5
D. Maximize Access to Urban Services	6
E. Facilitate Investment by the Private Sector	7
F. Address Environmental Problems	8
III. URBAN STRATEGY ELEMENTS	10
A. Administrative	11
B. Planning	12
C. Finance	13
IV. URBAN STRATEGY REQUIREMENTS	14
A. Establishing an Urban Data Base	14
B. Selection Criteria for Regional Centers	16
C. Developing Action and Structure Plans	18
D. Identifying and Prioritizing Projects	21
V. URBAN STRATEGY FRAMEWORK	23
A. Medium Term Actions	23
1. Regional Centers/Secondary Towns	23
2. Greater Colombo	27

Table of Contents, continued

B. Long Term Actions	32
1. Regional Centers	34
2. Greater Colombo	35
Annex 1	36
Figure 4.1 - Proposed Planning Organization	20
Figure 5.1 - Steps for Planning for Action	26
Figure 5.2 - Steps for Structure Planning	27
Figure 5.3 - Boundary of Colombo Urban Area	32

PREFACE

This document presents the results of a short-term collaboration among USAID/Sri Lanka; the National Planning Department, Ministry of Policy, Planning and Implementation; and the Urban Development Authority. The objective of the assignment was to articulate an appropriate urban strategy for Sri Lanka which could act as a framework for possible intervention by USAID/Sri Lanka in the urban sector.

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EXECUTIVE SUMMARY

**FRAMEWORK FOR AN
URBAN ACTION STRATEGY: SRI LANKA**

A. INTRODUCTION AND SCOPE

The purpose of the paper is to assist the Urban Development Cell (UDC) and the Urban Development Authority (UDA) to formulate and implement an Urban Action Strategy for Sri Lanka. In setting out the components which might comprise an Urban Action Strategy in Sri Lanka, the paper is meant to take the initial steps in the formulation of the strategy and point the direction to its early implementation.

B. URBAN STRATEGY OBJECTIVES

1. Facilitate Devolution/Decentralization

An effective urban strategy must assist in the implementation of Government's policy of devolving all development functions to the Provinces.

2. Strengthen Urban Institutions

The successful execution of an urban strategy will include strengthening the capacity of the relevant planning and implementing institutions, the most important of which are the UDA, the Urban Local Authorities, and the Planning Units of the Provincial Governments.

3. Improve Urban Resource Mobilization

The successful execution of an urban strategy will entail improved resource mobilization at the local level with a view to decreasing dependence on revenue grants through the Provincial Councils.

4. Maximize Access to Urban Services

A successful urban strategy will maximize access to existing and expanded urban services not only for the local urban populations but also their respective agricultural hinterlands.

5. Facilitate Investment by the Private Sector

An urban strategy cannot be implemented by the public sector alone. The public sector must plan and develop infrastructure and facilities in such a manner that they stimulate private sector investment, both formal and informal.

6. Address Environmental Problems

A successful urban strategy will address the concomitant environmental problems of urban development such as surface and groundwater pollution and soil and air pollution from industrial and household sources.

C. URBAN STRATEGY ELEMENTS

The broad characteristics of the proposed urban strategy can be divided into two main elements:

1. Regional Center Development

In order to achieve a more equitable distribution of economic activity and growth, and assist in the development of agro-processing industries, high value added manufacturing and small, labor intensive enterprises, selected regional centers (second tier) and secondary towns (third tier) will be targeted for critical development expenditure.

2. Planning and Management of Greater Colombo

As the country's leading industrial and commercial center, the more efficient economic functioning of the Greater Colombo area through improved planning and management of existing and future urban services is basic to an urban development strategy for the country.

D. URBAN STRATEGY REQUIREMENTS

1. Establishing an Urban Data Base

In order to develop and apply urban center selection criteria, a substantial urban data base is required. Information on the present and projected population, the urban economy including employment and income, urban growth patterns, assessment of existing and planned infrastructure, among others, is required for effective action and structure plans. The existing urban data base, however, is both out of date and not centralized in one place.

2. Selection Criteria for Regional Centers

An urban strategy will be most effective if it is concentrated in those regional centers which offer the greatest potential for development. Thus, various selection criteria such as potential to encourage agricultural and rural development through forward and backward linkages, potential urban agglomeration economies, existing transportation node, and maximum impact of infrastructure investment, are necessary to select regional growth centers from the existing network of secondary towns. In addition to various factors which specifically relate to Sri Lanka, an element of self-selection/competition is recommended, as well as the involvement of existing and potential private entrepreneurs in the selection process.

3. Developing Action and Structure Plans

The development of immediate action plans for the short term (1-2 years) and structure plans for the longer term (3-5 years) will ensure that project proposals are achievable, provide an order of priority for early projects and serve as an overall context for long term urban development. Details for the preparation of such plans are set out in a Planning Manual for Local Authorities which also provides guidelines for the integration of physical and economic planning.

4. Identifying and Prioritizing Projects

In the context of action and structure plans, projects can be identified and prioritized based on criteria such as affordability, economic and financial rates of return, operation and maintenance costs and availability of funds. Basic feasibility analyses should also be carried out if several projects are of high priority.

E. URBAN STRATEGY FRAMEWORK

1. Medium-Term Actions

a. Regional Centers

(1) Data base generation. As much basic data as possible should be assembled on each local authority and sent to the UDA for entry into its central computer. In the future desktop computers might be installed in each provincial planning office.

(2) Regional center selection. This exercise need not wait until a complete data base is assembled, but based on existing information and perhaps a

limited competition, several regional centers could be selected as focal points for the strategy.

- (3) Action and Structure Plan development.** Based on the sophistication of planning capacity and the size of the regional centers/secondary towns, Action or Structure Plans can be developed accordingly. Once the Planning Manual is finalized, training of local planning officers and relevant local officials in its use must be carried out.
- (4) Identification of projects and sources of funds.** Although the Decentralized Budget (DCB) is politically motivated, given the amounts involved, Heads of local authorities should actively lobby local MPs for appropriate investments. External funding can also be sought for secondary town development and institutional strengthening.
- (5) Institutional Strengthening.** In the context of devolution/decentralization, both the UDA and the UPU, which presently have centralized organizations, must be restructured and perhaps merged to better support regional center/secondary town development.

b. Greater Colombo

- (1) Data base and map generation.** Given the scale and complexity of Greater Colombo, it is recommended to use satellite imagery and Geographic Information Systems (GIS), a technology which is cheaper and quicker than aerial photos, to update urban data on Greater Colombo and present it geographically.
- (2) Identify area of influence.** Since the Colombo Master Plan has not been updated since its completion in 1978, it is uncertain what the area of influence, or boundary, of Greater Colombo is today. Using the foregoing technology, it is recommended that this be determined in order to establish a spatial frame of reference for future planning and programming.
- (3) Examine feasibility of establishing an area-wide planning commission.** Due to the fragmentation of government in Greater Colombo among some 16 local authorities, the feasibility of establishing a Greater Colombo Planning Commission which could coordinate the development of the metropolitan area should be examined.

2. Long-Term Actions

a. Regional Centers/Secondary Towns

- (1) Provincial Structure Plan development.** If Deputy Directors/Physical Planning are appointed in the offices of the Deputy Secretary/Planning in the Provincial Councils, efforts can be made to develop or adapt provincial structure plans which integrate spatial and economic development aspects.
- (2) Institutional strengthening of PC Planning Units.** Due to a lack of qualified staff in the PC Planning Units, training courses are required on essential subjects such as investment programming, project feasibility studies, industrial locational analysis, etc.

b. Greater Colombo

- (1) Update the Colombo Master Plan.** Since the Colombo Master Plan has largely outlived its usefulness as a framework which can guide the sectoral investments which direct urban growth, once the activities recommended in the Medium Term are completed, a comprehensive update of the Master Plan can be undertaken. This can be done using the same technology recommended above.
- (2) Establish a Greater Colombo Planning Commission.** The urbanization/industrialization process, which could accelerate if the Government's industrialization strategy is a success, must be guided not only by an updated Master Plan, but also the administrative authority to implement it. To this end, planning commissions in other large Asian cities have been created, with many being transformed into metropolitan development authorities.

CHAPTER 1

INTRODUCTION AND SCOPE

A. BACKGROUND

The purpose of this paper is to assist the Urban Development Cell (UDC) and the Urban Development Authority (UDA) to formulate and implement an Urban Sector Strategy for Sri Lanka. The UDC is a small, high level policy making body based in the UDA with representatives from the Town and Country Planning Department (TCPD) and the National Housing Development Authority (NHDA). The UDC was established in July 1989 with the approval of the Secretary, Ministry of Policy, Planning and Implementation (MPPI) with the following objectives:

1. Formulate and implement an Urban Development Strategy which will be broadly consistent with the country's medium term economic growth and long term development objectives.
2. Coordinate and spearhead the implementation of urban development projects and programmes, including externally assisted urban sector projects.

The Work Programme of the UDC lists five basic responsibilities of the unit:

1. Study and review the country's on-going urban development activities with the ultimate objective of evolving a comprehensive urban development policy.
2. Formulate medium and long term urban sector strategies and identify projects and programmes to be implemented by the relevant agencies.
3. Coordinate urban related development activities of all agencies and monitor their performance.
4. Coordinate implementation of donor funded projects.
5. Appraise all capital expenditure projects and programmes implemented by UDA with the objective of satisfying the financial viability of projects and generating a net return on investment to UDA.

It can be seen that the foregoing are formidable tasks. However, since the UDC is comprised of senior government officials including the Chairman, the Director General, the Additional Director General and the Economic Adviser of the UDA, all of whom have full time responsibilities either in UDA or elsewhere, it essentially does not have a staff to carry out these tasks. Nor at the present time can the staff of the UDA devote full time to these tasks.

In assisting the UDC and the UDA to formulate and implement an urban sector strategy, i.e., principally to carry out tasks 1 and 2, a major objective of this paper will be to recommend activities to enable these agencies to address the other tasks in the Work Programme. In spite of the lack of staff, the UDC is well positioned to have an overall coordinating and guiding influence on activities in the urban sector as a whole. Based in the Ministry of Policy, Planning and Implementation (MPPI), it is not only composed of high government officials but also has a Steering Committee of Secretaries of all urban related Ministries.

Further, although the UDC has not had the opportunity to formally carry out any of the tasks in its Work Programme, it does have a substantive appreciation of the major problems of the urban sector. The Work Programme recognizes that there is a vacuum in the formulation of an urban policy and a definitive urban strategy to implement the policy, and cites many of the problems which a strategy should address, viz:

- the lack of a comprehensive urban data base;
- the lack of coordination of urban development agencies;
- the lack of capacity in local authorities to plan and coordinate urban services;
- the need for a skills upgrading programme in the UDA;
- the need for proper feasibility studies of urban development projects, and;
- the requirements for urban investment plans for selected regional towns which may eventually be developed into secondary cities with an industrial base.

B. SCOPE

In attempting to assist the UDC/UDA to resolve the foregoing and other problems which plague the urban sector, this paper sets out the components of an Urban Action Strategy in Sri Lanka. Stressing the actions which government and the private sector must take to implement an urban strategy will hopefully stimulate government to ultimately formulate an urban policy for the sector. Up to now government thinking on directions and investment policies for the urban sector has not been explicit. It is unclear whether government would like to invest in secondary towns as centers for regional growth or to redistribute wealth to less developed areas, or perhaps both. Further, if the recently

published industrialization policy is a success, government cannot ignore its effects on Greater Colombo and must establish a spatial framework to guide increasing urbanization.

Up to the present time policy emphasis has been on the development of the rural sector as evidenced, among others, by the Mahaweli Project, multiple IRDP schemes, the annual Gamu Dawa projects, and the present emphasis on the rural development of the AGA Divisions. However, in feeling that urban development will take care of itself, government has largely ignored the role the urban sector can play in rural development.

Years of research on urban functions in rural development have shown that urban areas in the form of rural service centers, market towns and regional centers, through the provision of services, facilities, infrastructure, and productive activities, can and do play important roles in facilitating rural development. Towns and cities that act as agricultural markets, that provide basic services and public facilities for rural people, and that are linked to each other and to their surrounding rural areas can serve as the physical base for rural and regional economic growth. Thus, government must begin to realize that rural development will not succeed without the successful development of the urban sector, linked as it is to the rural sector through forward marketing and production linkages and backward service linkages.

The development of urban linkages to the rural sector is also seen as a promising area in USAID/Sri Lanka's strategy to increase incomes and employment and improve access to and control over development resources by the people. USAID has consequently been collaborating closely with Government in establishing an approach to resolving the problems of the urban sector. A key aspect of this collaboration is an attempt to discern how USAID might assist Government in achieving one of the major goals of the UDC, i.e., the coordination of urban related development activities of government agencies as well as the urban investments of donors and the private sector. In the coordination of donor investments, for example, the selective use of conditions precedent to grant and loan disbursements, can encourage Government to take the necessary actions to implement an urban strategy.

This, however, is a difficult task in the absence of an official urban policy. In an attempt to correct this situation, this paper sets out a framework for an Urban Action Strategy which, if followed, should not only improve the coordination of urban investment at the local level, but stimulate Government to formulate an official urban policy which recognizes the necessity to develop the urban sector in order to realize successful development of the rural sector. The paper therefore takes the initial steps in establishing such a strategy and points the direction to its early implementation. In areas of the strategy requiring further elaboration, additional technical assistance and equipment requirements to do so

are highlighted. The paper also draws on an Urban Sector Study of Sri Lanka (PADCO, 1990) as well as the work done under a companion contract to assist the UDA to develop a Planning Manual for Local Authorities.

In spite of the lack of a comprehensive urban policy, the next chapter sets out several objectives for the successful execution of an Urban Action Strategy which, in the context of Sri Lankan political/administrative decentralization and the continuing predominant role of Greater Colombo in the urban sector, might ultimately be incorporated into an urban policy. The third chapter divides the broad characteristics of the strategy into two basic elements, or propositions of the strategy, while the fourth chapter details the requirements of an action based strategy. The fifth chapter then outlines the framework of the strategy according to medium and long term actions broken down by the strategy's two major elements.

CHAPTER 2

URBAN STRATEGY OBJECTIVES

A. FACILITATE DEVOLUTION/DECENTRALIZATION

An effective urban strategy must assist in the execution of Government's policy of devolving development implementation functions to the Provinces.

A major goal of GSL's current policy of devolution is the promotion of greater regional economic development throughout the country for the purpose of reducing employment and income disparities between Colombo and the rest of the island. This objective is being achieved through political decentralization and the implementation of an industrialization policy which encourages private enterprise and investment. One of the aims of the latter is to establish linkages between industries in urban centers and dispersed, labor intensive producers to ensure that the benefits of development are better distributed among the people.

These goals can only be achieved through the development of secondary cities and towns as economic growth centers with efficient backward and forward linkages to their agricultural hinterlands and sources of supply as well as to major manufacturing and export centers. Successful implementation of this development pattern will in turn require substantial investment in carefully planned urban and inter-urban infrastructure, if private investment is to be attracted to regional centers and secondary towns. By decentralizing urban planning to the urban local authority (ULA) level and integrating it with the economic planning which is presently occurring there, an urban strategy can more effectively coordinate and guide the required local investment to achieve government's objectives.

B. STRENGTHEN URBAN INSTITUTIONS

Successful execution of an urban strategy must include strengthening the capacity of the relevant institutions - the UDA, the Urban Program Unit (UPU), the Urban Local Authorities, and the Planning Units of the Provincial Councils (PCs) - in order to improve their performance in the planning and coordination of infrastructure investment both in secondary towns and Greater Colombo.

Thus far the urban institutional framework has been highly centralized with local development plans and policy decisions being made in Colombo. As a result there is a critical lack of physical planning capacity in ULAs and economic planning capacity at the provincial level. Further, most of the work in Colombo as well as the local authorities is being done manually with a minimal use of computers and computer software in data collection and processing, planning, design, financial analysis, and project feasibility studies.

More significant for the improved planning and coordination of urban infrastructure and services, is the lack of collaboration among urban institutions. Thus, although the UDA and the UPU are serving the same ULAs (with the exception of those in Greater Colombo for the UPU), up to now there has been no cooperation between the two organizations in the achievement of their goals to strengthen the planning and management capacity of the ULAs. Moreover, much of the investment of the line agencies and the provincial councils in local authority areas is often undertaken without consultation with local authority officials, with the result that the investment is either not according to local priorities, or local authorities cannot afford the operation and maintenance costs.

Thus a major emphasis in strengthening the relevant institutions to implement what in large part will be a decentralized urban strategy must be the improvement of communications and cooperation among the institutions in planning, implementing, managing and operating the infrastructure and services which will direct urban growth and attract private sector investment.

C. IMPROVE URBAN RESOURCE MOBILIZATION

A successful urban strategy will entail improved resource mobilization at the local level with a view to decreasing dependence on revenue grants through the Provincial Councils.

For several years the UPU has been assisting ULAs to improve their performance largely through improving their revenue base and controlling expenditures. The results, however, have been mixed. For 37 ULAs total revenue covered about 76% of total expenditure in 1986 and 1988 but dipped to 69% in 1987. Government revenue grants, which cover the previous year's deficit, averaged some 31% of total revenue in 1988, but did not include the subsidies required to pay the CEB and the NWSDB overdue accounts, both of which increased substantially from 1986 to 1988. While collection of property taxes increased by some 57% between 1985 and 1988, the property tax accounted for only 15% of total revenue collected.

Since government has requested ULAs to limit capital expenditures, an increase in revenue grants through the PCs is highly unlikely. Thus, if ULAs are to increase expenditures required to implement, manage and maintain urban infrastructure and services, local funding will have to be mobilized on a hitherto unprecedented scale. This will entail not only an increased effectiveness in the timely valuation of properties and collection of taxes, but also the initiation of various revenue generating projects. In order for the implementation of an action oriented urban strategy to succeed, methods to accomplish these means must be worked out through close collaboration of the UDA and the UPU.

D. MAXIMIZE ACCESS TO URBAN SERVICES

A successful urban strategy will maximize access to existing and expanded urban services not only for the local populations but also for their respective agricultural hinterlands.

This objective must be considered on two levels: the national level, with Colombo providing the services, and the regional or local level, with regional centers and secondary towns providing the services.

Based on available data as quoted in the Urban Sector Study and the Urban Sector Profile (ADB, 1988), it is evident that Colombo has maintained its demographic and economic primacy due to agglomeration economies and the existing network of physical infrastructure, which remains essentially unchanged from the pre-independence era. With increased industrialization, Colombo could grow even more rapidly in the future. Thus, improved planning and management of Greater Colombo, such that the existing and transient population can obtain improved access to the capital's services, must be a basic element of an urban strategy.

In the outlying areas, most ULAs function mainly as market, trading and agricultural service centers. Although these are important urban functions, they do not create a substantial employment base. As agricultural land begins to become saturated, secondary towns and regional centers must also become centers for off-farm employment. Thus, in order to accomplish the objective of increasing access to urban services in rural areas, a basic element of an urban strategy must be the development of selected secondary towns as regional economic growth centers, with the remainder being developed to carry out their functions as market and trading centers more efficiently.

E. FACILITATE INVESTMENT BY THE PRIVATE SECTOR

An Urban Action Strategy cannot be implemented by the public sector alone. The public sector must plan and develop infrastructure facilities in such a manner that they stimulate private sector investment, both formal and informal.

The objectives of an effective urban strategy, especially improved resource mobilization and maximum access to urban services, cannot be achieved without the full participation of the private sector in the implementation of the strategy. Planning of improved and/or expanded infrastructure and services must therefore take market factors into account and be closely related to the needs of potential investors. In doing so it should be recognized that infrastructure and service requirements for formal industry are substantially different from those required to stimulate the informal sector, composed as it is of labor intensive, micro-enterprises.

According to a study of the informal sector in Colombo, the number of persons employed in the informal sector and their dependents totalled some 40% of the city's population. If increasing rural-urban migration does occur in the coming decade, it will most likely be the informal sector which will absorb the majority of migrants. Thus, an effective urban strategy should facilitate and guide the growth of the informal sector such that the urban poor and small scale enterprises are linked to the larger urban economy.

F. ADDRESS ENVIRONMENTAL PROBLEMS

A successful urban strategy will address the concomitant environmental problems of urban development such as surface and groundwater pollution and soil and air pollution from industrial and household sources.

Colombo has grown relatively slowly compared to other Asian capital cities. The opportunity therefore exists to prevent an increase in environmental problems through prior guidance and management, which is much less costly than subsequent clean-up. The Urban Action Strategy can take advantage of this opportunity through collaboration with the Metropolitan Environmental Improvement Programme (MEIP).

MEIP, which is proposed for Greater Colombo, is a UNDP funded, World Bank executed programme, which incorporates environmental considerations into urban/industrial

strategies for major cities in Asia which are suffering from rapid urbanization and industrial pollution. At the present time endorsement is being sought from the MEIP Steering Committee for further action on the preparation of an environmental management strategy for the Colombo Metropolitan Region (CMR) and subsequent action plans. Preparation of such a strategy would include:

1. preparation of an industrial pollution control programme for the CMR;
2. preparation of a slum and shanty upgrading and road drainage programme in the CMR;
3. a study on the technical and economic causes of vehicular emissions and the regulatory measures and incentives required to reduce them to acceptable levels;
4. participation by GSL representatives in intercountry workshops being organized by MEIP.

Through collaboration with MEIP in the implementation of an Urban Action Strategy, environmental problems can be addressed initially in Greater Colombo and, applying the techniques learned, subsequently in other ULAs.

CHAPTER 3

URBAN STRATEGY ELEMENTS

There seems to be a growing consensus in Sri Lanka on two basic points which will have a major bearing on any urban strategy: (i) economic development must be based on the diversification of agricultural exports beyond the three traditional crops and development of industries with high value added; and (ii) economic growth should be decentralized from Colombo. Further, while urban development strategies have been debated in the past, i.e., among continued concentration in Colombo, development of a counter-magnet to Colombo, and development of a growth corridor, there also seems to be a consensus on the most effective strategy for achieving a more equitable distribution of economic activity, employment and incomes throughout the country.

The strategy, which is the first basic element of the Urban Action Strategy set out in this paper, is the development of a number of secondary towns as regional centers for agro-processing industries, marketing and distribution activities, and production of various types of intermediate and final goods.

Essentially, the secondary towns can be divided into two tiers: one composed of several regional centers, not necessarily all Provincial capitals, which have significant growth and employment potential as well as backward and forward linkages to their agricultural hinterlands. The development of these centers will greatly benefit from the integration of economic and physical plans in the framework of structural development plans as proposed in the next chapter. Thus, selection criteria must be very carefully applied when selecting such centers for increased investment.

The second tier of secondary towns are those smaller urban councils and Pradeshiya Sabhas which have far less growth potential, and for which an improvement in their functions as agricultural marketing, trade and service centers is priority. It is for these towns that the local action plans and the application of the Planning Manual for Local Authorities, as described in the next chapter, will be the most beneficial.

Another major element in any urban strategy is improvements to transportation corridors. Inter-urban transport links, both road and rail, are necessary to make less developed

regions economically viable and to link them with the wider economy. Good road connections between important economic centers also tend to generate further growth along the road itself. An urban strategy which fails to take into account the need for and potential impact of inter-urban transport is likely to compromise the promotion of more balanced and equitable economic growth. The recently completed Sri Lanka Transport Sector Planning Study (Berger, 1988) contains important policy recommendations along these lines and indicative investment proposals for Government. This study should therefore be read in conjunction with this paper, and related plans and investments linked wherever possible.

It is the contention of this paper, however, that, as the country's leading industrial and commercial center, the more efficient economic functioning of the Greater Colombo area through improved planning and management of existing and future urban services should be the second basic element of an urban strategy for the country.

The discussion of the proposed urban strategy's objectives in the previous Chapter contained the dual themes of the necessity to develop several up-country regional towns beyond the point of agricultural processing and marketing centers, while simultaneously devoting attention to improved planning, development and environmental control in Greater Colombo. In fact, the primacy of Greater Colombo - 42% of the urban population, 65% of industrial output and 42% of manufacturing employment in 1981 - and the magnitude of its urban problems serve to highlight a basic characteristic of the urban sector in Sri Lanka - its duality. While the difference in urbanization and urban problems between Greater Colombo and outlying ULAs is primarily one of scale, any urban strategy for the country must take into account this duality.

To obtain an idea of urban duality in Sri Lanka, the recent Urban Sector Study compared urban issues between Colombo and outlying ULAs along administrative, planning and financial lines. In order to establish the basic requirements for an Urban Action Strategy as well as a framework for medium and long term actions to implement the strategy, these issues are summarized here.

A. ADMINISTRATIVE

ULAs

1. Major linkages to date are between the PCs, the AGA Divisions, and the Pradeshiya Sabhas (PBs). The ULAs have not yet formed an administrative link with the PCs.

2. An administrative link between ULAs and the PCs is essential since urban development will henceforth be viewed in the provincial context.
3. Without a spokesman at the center, many ULAs could be left on their own to deal with growing urban problems.

Greater Colombo

1. At present Greater Colombo is composed of two municipal councils, five urban councils and some nine PBs (former town councils), a fragmentation of urban government to which the Western Provincial Council has been added.
2. The lack of a Greater Colombo metropolitan government has a significant impact on the coordination and implementation of urban development.
3. Local authority services such as sanitation, health and secondary and tertiary road networks can only deteriorate as the growth of Greater Colombo outstrips a fragmented administrative capacity.

B. PLANNING

ULAs

1. There is a basic dichotomy between economic planning at the PCs and physical land-use planning in the ULAs.
2. Development planning at the ULAs consists only of selecting projects for the capital budget.
3. The opportunity to effectively plan and manage urban growth in the provinces will be lost if planners in the PCs are not aware of the spatial consequences of investments and ULA planners continue to take a map oriented versus a programme oriented approach.

Greater Colombo

1. Due to a lack of knowledge as to the extent of the area of influence, or built up area, of Greater Colombo, establishment of a definitive boundary for the area as well as an area-wide planning commission could substantially ameliorate administrative and planning coordination problems in the metropolitan area.

2. The same planning problems plague local authorities in Greater Colombo as in outlying areas, i.e., an approach to planning as a land use control mechanism rather than a programmatic vehicle with which to guide urban development.
3. The need for a structural development plan is particularly evident in the Western Province where the lack of attention to the spatial aspects of planning is manifest.

C. FINANCE

ULAs

1. Since Government has requested ULAs to limit capital expenditure, a major issue is the mobilization of funds to implement and maintain urban infrastructure and services.
2. Increased valuations and collections of the property tax and the BTT will require assistance from the UPU.
3. The Local Loans Development Fund (LLDF) must be resuscitated in order to finance revenue generating projects for the ULAs.

Greater Colombo

1. Given the increasing demand for urban services, the financial requirements of the local authorities in the Greater Colombo area are even greater than those for outlying local authorities.
2. As in the other provinces, the local authorities in Greater Colombo continue to rely on central (now provincial) government revenue grants and increased investment by line agencies.
3. Along with the limitation on future revenue grants through the Provincial Councils, it is uncertain whether central government will be willing to undertake additional national debt in order to finance urban infrastructure in Colombo.
4. As in outlying local authorities, the requirement to mobilize local resources is crucial, as is the ability of line agencies to become more efficient in charging and collecting the full costs of public services.

CHAPTER 4

URBAN STRATEGY REQUIREMENTS

In order to accomplish the objectives of an Urban Action Strategy contained in Chapter 2, this Chapter sets out the actions which are required to implement the Urban Strategy Framework proposed in the next chapter.

A. ESTABLISHING AN URBAN DATA BASE

At the present time the urban data base in Sri Lanka is both weak and out of date. This is due to several reasons among which are the rural bias of previous development efforts and the fact that the last census was taken in 1981. Although the census did break down population, housing and employment statistics by urban and rural areas, in many districts Town Councils, of which there were 86 in 1981, were not included as urban areas. The same is true for rural service centers which had distinctly urban characteristics but were not Town Councils, and AGA Divisions which are adjacent to Greater Colombo and the Municipality of Kandy, but which were not considered as urban.

The foregoing highlights a definitional issue, which was pointed out in the Urban Sector Study. In 1981 the official definition of the urban population was that population residing in municipal, urban and town council areas. However, in 1987 the Constitutional Amendment creating the Provincial Councils and the Pradeshiya Sabhas effectively abolished town councils in that all town councils were absorbed into the 257 Pradeshiya Sabhas. Since the current definition of urban, i.e., that population residing in municipal and urban council areas, would significantly distort the extent of urbanization and the share of urban population in Sri Lanka, a more realistic definition of urban, based on population in places over 5000, densities, urban characteristics and percent employed in non-agricultural activities, is presently under discussion with the Department of Census and Statistics for use in the 1991 census.

Although a more accurate definition of the urban population should allow a better understanding of the characteristics of the urban sector, including rural-urban migration, urban poverty, the role of the urban sector in the economy, and hence the formulation of an updated urban strategy, such data will not be available for one or two years. In the meantime an effort must be undertaken to assemble an existing urban data base, i.e., one which can be updated with the results of the new census.

As the institution responsible for urban planning and development in the country, the UDA must take the lead in this effort. Although an urban data base does exist in the country, at the present time it is fragmented by urban areas with most of the data located in the local authority itself. Further, much of the data has been compiled for what are now outdated master plans for various local authorities which have never been formally approved and gazetted. Thus, it is not available in one central location. It seems that even the landholdings of the UDA, while existing according to map coordinates and local area location, have not been assembled on a computer nor a composite map by province or the country as a whole.

As will be recommended in the next section, it should not be a difficult task to have Planning Officers in each local authority assemble basic data such as population and population projections, existing and projected land use, housing needs, employment and income data, assessment of existing and planned infrastructure, local authority finances and investment plans, among others, and send them to the UDA for entry on their central computer.

A source for some of this data might be the present survey on the resource base and economic activities being undertaken in all AGA Divisions by the Regional Development Division (RDD) of MPPI. At present some 175 resource profiles have been completed of the 283 AGA Divisions. While the surveys are essentially rural based, information on the status of infrastructure, community facilities, employment, commercial services, marketing facilities, etc., is available. Since the information is for the entire AGA Division, the resource profiles can be revised for urban development according to local plans in the urban areas of the AGA Divisions.

With respect to Greater Colombo, the Colombo Master Plan, which was completed in 1978 and out of which the UDA was formed, has not been updated since its completion. While the Development Controls section has been approved and gazetted, the land use portion and the data on which it is based has not been systematically updated and used for investment planning. Although each of the councils composing Greater Colombo has a more recent data base and has a detailed knowledge of its growth trends, land use, urban infrastructure requirements, extent of urban poverty, environmental problems, etc., here too the data has not been assembled in one place for use in the on-going planning, management and development of Greater Colombo.

Given the size and complexities of Colombo and the dominant role it plays in the urban sector, manual data base collection and assembly will not suffice to define its role in an urban strategy. The next chapter therefore recommends use of satellite images and geographical information systems (GIS) to generate maps and data such that in the longer term

an update of the Colombo Master Plan, in a manner which will facilitate continual updating, can be accomplished.

B. SELECTION CRITERIA FOR REGIONAL CENTERS

As mentioned in the previous Chapter, the proposed strategy calls for investment in a series of secondary towns divided into two tiers: one composed of several regional centers which have significant growth and employment potential, and the second composed of urban councils and Pradeshiya Sabhas which have less growth potential and for which an improvement in their role as agricultural service centers is priority. In order to choose the secondary towns which will become members of the of the second tier, and therefore attract more public and private investment, a series of selection criteria must be developed.

Although there are no magic criteria with which to select one secondary town over another, some basic considerations for the formulation of more specific criteria can be listed as follows:

- the town should have the potential to encourage agricultural and rural development through the growth of forward and backward linkages;
- the town should have the potential for significant urban agglomeration economies, i.e. a skilled labor base, business and government services, shared repair facilities, access to markets and delivery services, and adequate infrastructure and urban services;
- those towns in which infrastructure extension and infrastructure rehabilitation projects will have the most impact, or where excess infrastructure and services capacity exists;
- those towns which may be the node of major transportation routes, road and railway and sea and air, thus enabling ready access to their hinterland as well as interior and exterior markets;
- those towns in which rapid growth has already outstripped housing supply and urban services and in which returns on public investment will be maximized through increased private investment.

Various factors which more specifically relate to the Sri Lankan context should also be taken into consideration in the selection of second tier regional centers. Among these are:

- the proposed accelerated development of the Southern Province, including the possible development of Galle port as Colombo port reaches capacity;
- the Mahaweli development programme in which a second generation will be seeking employment, and which includes several growing settlements which are presently not defined as urban;

- the potential opening up and reconstruction of the North and East including Trincomalee, one of the best deepwater ports in the region and a logical choice for servicing the Mahaweli Project area, and Jaffna, the main town and commercial center of the North with a large potential hinterland;
- the further development of the GCEC area, including a second EPZ at Biyagama, and the role of Negombo in providing linkages between local firms and those located in the EPZs;
- the development of tourism along the western and southern coasts and its relation to the one kilometer coastal zone declared as a Development Area under the UDA Act, as well as the environmental impact of such development.
- the existing but unofficial Regional Development Plan for the Central Province (Dept. of Town and Country Planning, Univ. of Moratuwa, 1989), with its data, infrastructure costs, and development alternatives of growth corridors/growth centers and loop development.
- the January 1990 Corporate Plan of the North-Western Provincial Council for the years 1990-93. However, chapters on Roads and Transport, Water Supply and Drainage, and Housing and Shelter have yet to be done.

An additional aspect of regional center selection, which would be closely related to the present efforts of the UDA and the UPU to improve the performance and capabilities of the local authorities, would be a process containing an element of self-selection. In the past the disbursement of a certain amount of discretionary funding to local authorities was based on a points system awarded on the basis of performance according to various criteria agreed the previous year. In 1989 the system stressed the elimination of budget deficits, a halt to deterioration of infrastructure, and the need to generate increased revenue. Such a system combined with the acceptance and development of action, structure and local plans, now being introduced by the UDA, would allow secondary towns, most probably in the third tier, to compete for development subsidies and loans.

In addition, in order to ensure the involvement of the private sector in the urban strategy, the regional center selection and planning process should involve existing and potential entrepreneurs, formal as well as informal. It should not be solely a public sector process. Only in this manner can costly failures, usually resulting from a failure to take market factors adequately into account, be avoided.

C. DEVELOPING ACTION AND STRUCTURE PLANS

Once the regional centers to be targeted for investment have been selected, integrated action plans, if not already in place, must be developed. The development of immediate action plans for the short term (1-2 years) and structural plans for the longer term (3-5 years) will ensure that project proposals are achievable and provide an order of priority for early projects as well as an overall context for long term urban development. Only in the context of integrated economic and physical plans can the investments of both the public and private sectors be optimized.

The previous Chapters have stressed the lack of integration of the physical development plans of the local authorities and the economic development plans being developed at the Provincial and AGA levels. With the assistance of USAID, definitive steps are being taken to rectify this situation. In the past few months a Planning Manual for Local Authorities has been developed by the UDA and USAID consultants with two main objectives: (i) to provide guidelines to improve the level of planning in local authorities, and (ii) to provide guidelines for improved coordination of physical and economic planning.

The Manual, which is for the use of local authorities (MCs, UCs and Pradeshiya Sabhas), the UDA, Provincial Councils and MPPI, is meant primarily to be used in the decentralization of planning by the UDA. Up to now UDA Planning Officers in the local authorities have been involved primarily in the enforcement of development controls through the review and approval of building applications, and have not had time for the formulation and/or updating of local authority development plans. Although this function was decentralized in 1985, the capability to carry it out, in the form of Assistant and Deputy Directors of Planning, remained at UDA headquarters.

According to a recent (7/5/90) circular to all Heads of local authorities from the UDA Board of Management, however, the UDA has undertaken to "... vigorously promote the execution of the delegated powers and functions of Planning by the Local Authorities," through the decentralization of planning staff involved with the preparation of such plans. Only a core group of planners will be retained to coordinate support to local authorities in the preparation of Town Development Plans.

The Planning Manual for Local Authorities is meant to facilitate this process. It therefore contains chapters on a recommended administrative organization to effect integrated action planning at the local level, as well as a chapter on the development of short term Action Plans, longer term Structure Plans and more immediate Local Plans. A chapter on economic planning and how it might be integrated with the foregoing through the development of capital plans, programmes and projects is also included.

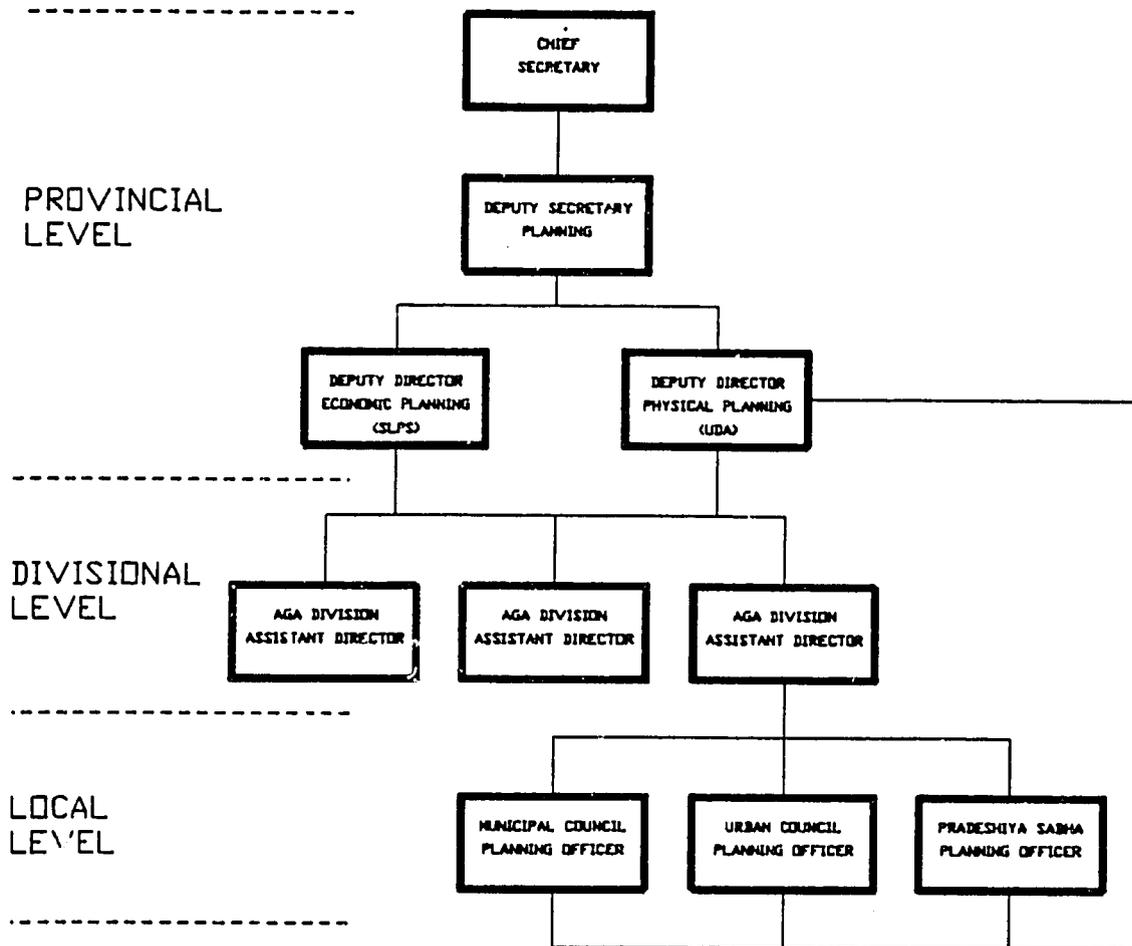
While the guidelines to achieve improved local level planning are set out in a series of steps to develop the various plans, the key to the integration of physical and economic planning is contained in a revised organization of the Provincial Deputy Secretary/Planning's office which is under the Chief Secretary. It is proposed to add an additional Deputy Director/Physical Planning along with the existing Deputy Director/Economic Planning. The former, which would be assigned from the UDA, would not only assist in the development of the spatial aspects of Provincial development plans, but would also supervise and provide support to the local authority planning officers located in the Province (see Figure 4.1). Since the flows of budget funds from the Provincial Councils to the local authorities will be coming through the AGA Divisions, the Assistant Directors of Economic Planning in these Divisions will also be involved in the process.

As a reinforcement for the integration of physical and economic planning, the UPU is also in the process of publishing several manuals for the use of local authorities. These include a General Management Manual, a Financial Management Manual and a Resource Mobilization Manual. In order to improve the capital investment decision-making process, i.e., capital budgeting, the Financial Management Manual contains detailed steps on the development of Capital Plans, Capital Programmes and Capital Projects. Since the time frames of these are roughly equivalent to those of Structure, Action and Local Plans, it is recommended in Chapter 4 of the Planning Manual that the capital budgeting process be an integral part of the development of the various physical plans.

In order to make the Manual as realistic as possible, a draft version was presented at a series of workshops in seven provincial capitals. In these workshops, which were attended by provincial, district and local authority officials, many problems not only of planning coordination but also of investment coordination and improved organization for development were voiced.

As mentioned in Chapter 2, one of the most persistent problems throughout the country was the lack of coordination of investments at the local level. Often line ministries and especially line agencies would invest in local authority areas without notifying the local authority. Moreover, they would then seek to turn the completed project over to the local authority, which the local authority invariably could not afford. **In order to prevent this occurrence in the future, a consensus was reached that no investment could be made in a local authority area without a local Action or Structure Plan and the consequent approval of the local authority.** It is proposed that this requirement be conveyed as directive to line ministries and agencies either by the Secretary, MPPI or, if necessary, the Cabinet.

Figure 4.1
PROPOSED PLANNING ORGANIZATION



D. IDENTIFYING AND PRIORITIZING PROJECTS

In the context of Action and Structure Plans, projects can be identified and prioritized based on criteria such as affordability by the local authority, economic and financial rates of return, operation and maintenance costs and availability of funds. Proposed projects from different sectors should be prioritized according to at least two different dimensions. First, all investments compete with one another for limited capital resources. Therefore, they should be ranked in terms of priority within the capital budget constraint. Second, many projects complement one another in function and should be planned and implemented as a package.

An example where coordination is necessary occurs in economic development planning where, depending upon the mix of economic activities to be encouraged, local planners may have to provide for a sectorally-linked strategy that provides developed land for industries, establishes transportation connections between the work zone and residential zones, and upgrades infrastructure services.

Through the Action or Structure Planning procedures outlined in the Manual, a desirable list of feasible projects can be identified. The rating system outlined below can be used to select projects for funding. Criteria to be considered are:

1. Its relevance and priority in advancing the aims of the Capital Plan.
2. It provides the best alternative in terms of capital and operating costs and the maximum response to expressed needs.
3. It is compatible with earmarked and ongoing projects.
4. It provides a measurable contribution to economic development and employment generation in the area.
5. It has a high level of cost recovery and future revenue generation as indicated by a positive Internal Rate of Return (IRR).
6. Operation and maintenance costs are affordable by the local authority.
7. It provides a level of benefits to low-income target groups.
8. The environmental impact of the proposed project is either positive or negligible.

Prioritization of projects is not a single operation but may need to be repeated several times with increasingly more detailed analysis of higher ranking projects to reach a final decision, especially if several are of high priority. Although there are many different types of projects, they all have some elements in common:

- they have a purpose;
- they have a size;
- they have a site;
- they have construction (capital) costs;
- they have operating and maintenance costs;
- they have benefits, e.g. income;
- they have social and environmental costs and benefits.

A brief analysis of each of these project components should be undertaken to ensure that the project doesn't incur a loss or, if the benefits are social, that they are substantial. In the case of choices between high priority projects or different ways to develop a project, e.g., phased versus total construction or a high cost/low maintenance versus low cost/high maintenance project, discounted cash flow analysis is an invaluable tool. Using this technique, it is necessary to work out the costs (capital, operating and maintenance) and a conservative estimate of the income of the alternatives on an annual basis and compare them. For each alternative it is best to project each of the costs, as presented in the feasibility study, and all the income, annually, for the length of the loan or the estimated economic life of the project. The results are often quite different from what is intuitively expected. Such an analysis (IRR or NPV) can also be done on simple hand calculators with financial programmes.

CHAPTER 5

URBAN STRATEGY FRAMEWORK

Based on the objectives, elements and requirements of an Urban Action Strategy as contained in the previous Chapters, this Chapter outlines an urban strategy framework composed of actions which might be taken in the medium and long term according to the two elements of the strategy, viz. regional centers/secondary towns and Greater Colombo.

A. MEDIUM TERM ACTIONS

1. Regional Centers/Secondary Towns

a. Data Base Generation. As mentioned in Chapter 4, although the existing urban data base is fragmented and out of date, relatively simple steps can be taken to update existing data and, more importantly, to centralize it in one place. Thus, a basic outline of data required to update existing draft development plans of local authorities might also be used pro tem as the basis for regional center selection criteria. According to the Planning Manual for Local Authorities, basic data needed for Structure Planning include:

Population Data

- Present population estimate
- Population growth rates
- Population projections for 10 years
- Household size

Economic and Administrative Functions

- Main economic function and activities
- Administrative functions
- Natural resources
- Sources of employment
- Employment and unemployment rates

Land Use

- General categories and areas
- Vacant land available for development

Infrastructure Assessment

Types of services

Areas served and percentage of population served

Problems from lack of services or with present systems

Projections of infrastructure needs

Community Facilities

Existing facilities

Deficiencies

Projected needs

Environmental Data

Topography and general drainage patterns

Environmentally sensitive areas

Zones subject to flooding or other disasters

As a first step, as much as possible of such data should be assembled and sent to the UDA for entry on its central computer. Data that is out of date or for which more time is required for assembly, e.g., infrastructure assessment and projection of need, can subsequently be generated. In the medium term, plans should also be made to install desktop computers, which are compatible with UDA's central computer, in each provincial planning office such that the province will have a data base on each local authority and can send regularly updated data on diskette to the UDA.

b. Regional center selection. This exercise need not wait until a complete data base is assembled on each secondary town. Rather, based on existing data and information, existing (recent) development plans, regional center size, existing and potential physical and economic growth rates, existing and projected provincial budgets, and perhaps a limited competition as suggested in Chapter 4, several second tier regional centers could be selected. Without biasing any future selection, it seems that the following might be examples:

(1) **Kandy.** The capital of the Central Province and a center for agro-processing industries serving the plantations and small farmers growing cash crops. Commercial and secondary industrial development could be significant. An unofficial provincial development plan exists as well as a new Gamu Dawa/Janisaviya training site. Even in Kandy, however, investment coordination is lacking with the Provincial Council building more community centers, which are in surplus, when more schools are needed.

(2) **Kurunegala.** Strategically located at the junction of major transportation routes and in the center of the 'coconut triangle', it has great potential as a distribution, light manufacturing and agro-processing center. Basic facilities such as a fire brigade, adequate solid waste collection and septic tank emptiers are, however, lacking.

(3) **Galle.** As the major town of the South, it will be the focal point in the strategy for the accelerated development of the Southern Province. The potential for secondary investment to integrate local small scale enterprises with the larger firms of the proposed EPZ and the transshipment port is significant. The recently completed provincial development plan should be studied and the relevant data computerized at the Provincial Planning Office and the UDA.

(4) **Hambantota.** Located in one of the fastest population growing districts in the country, it is the center of the salt industry as well as a major service center for the far south. Being located near a major wildlife reserve, religious center and the beaches of the south, it also has some tourist potential.

With the cessation of social unrest in the Northeast, regional centers such as Trincomalee and Jaffna should also be considered.

c. Action and Structure Plan development. Based on the sophistication of planning capacity and the size of the regional centers and/or secondary towns, Action or Structure Plans can be developed accordingly. Figures 5.1 and 5.2 show the necessary steps for the development of such plans. Since the steps are described in detail in the Planning Manual, they will not be repeated here. What remains to be done is the training of local planning officers and relevant local officials in the Manual's use.

d. Identification of projects. Identification of specific project proposals is outside the scope of this paper and will require further study along the lines set out in Chapter 4. However, it is possible to sketch out the sources of revenue available to local authorities for capital projects, and also various possibilities of external funding for regional center/secondary town development.

In the context of devolution, local authorities will retain their traditional sources of revenue, i.e., rates (property taxes) and other taxes such as business, trade and entertainment taxes, plus licensing fees. As from 1990, revenue grants from Government come through the Provincial Councils. However, these funds are traditionally used to cover the deficit between expenditure and revenue on the recurrent budget. Thus, sources of funds for capital expenditure in local authorities are minimal. For example, in the Kurunegala MC only Rs. 2.4 million, or 5.7% of total expenditure, is estimated for capital expenditure in 1990.

Figure 5.1
STEPS FOR PLANNING FOR ACTION

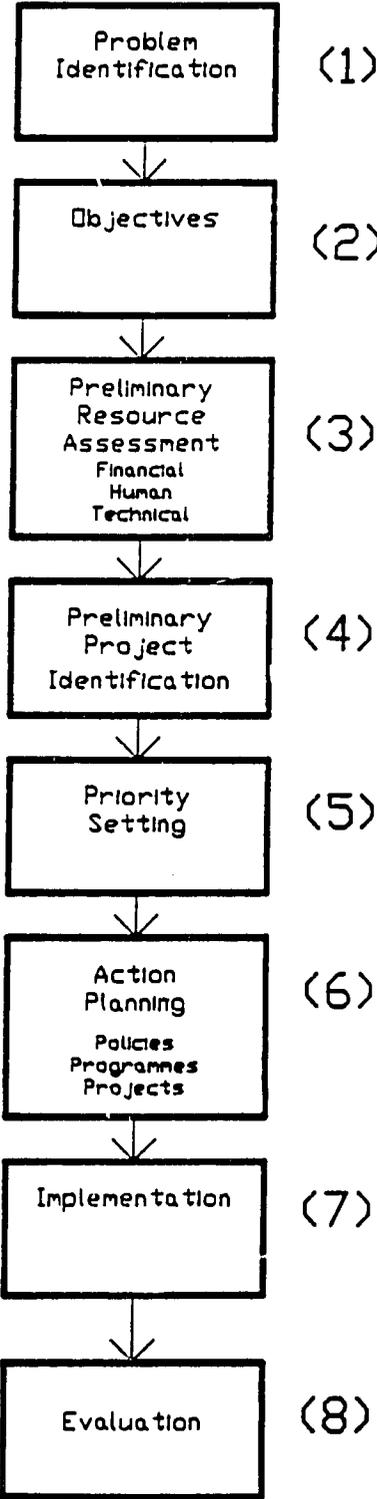
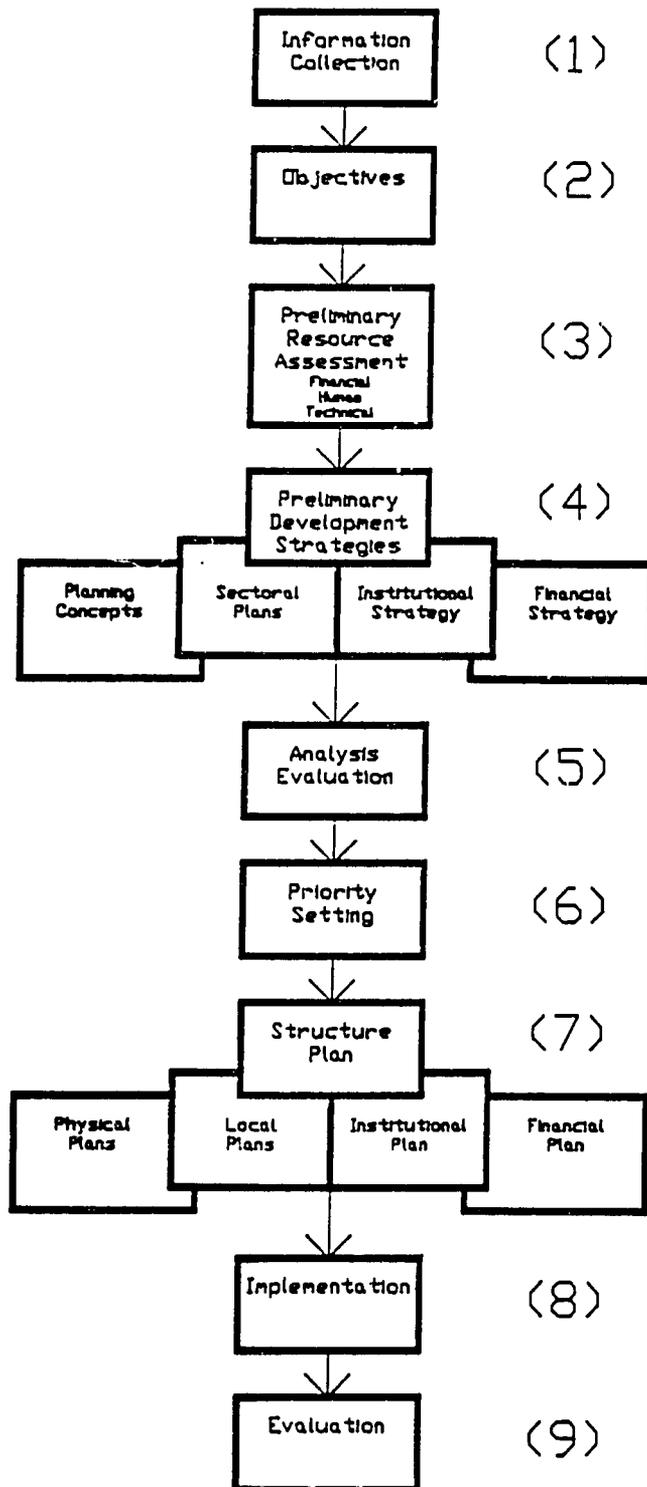


Figure 5.2
STEPS FOR STRUCTURE PLANNING



Another traditional source of funds for capital development at the local level, however, is the 'Decentralized Budget' or DCB. The DCB is composed of Rs. 2.5 million allotted annually to each MP for development in his District. However, as there are no local electorates, there are often several MPs per district, each with Rs. 2.5 million to invest in local development projects in one or more urban or rural local authorities. In order to access such funds, the AGA Special Commissioner or appointed Special Commissioner in the area(s) in which the MP is interested, submits a list of possible projects to the MP and, after selection by the MP, informs the GA who controls the funds for such projects.

Thus, even though the DCB can be a sizable amount for capital development in any one local authority, it is essentially politically motivated. Further, since the project list is made up by the AGA and the funds are controlled by the GA, it seems that up to now the ULAs have not been an active participant in the process. Given the amounts involved, however, local planning and financial officers should take this source into account when drawing up their Action Plans and Capital Programmes, and Heads of local authorities should actively lobby local MPs for appropriate investments.

Another source of funds for financing capital projects, both infrastructure and revenue generating, in secondary towns is through bilateral and multilateral institutions. An example of this is the planned resuscitation of the Local Loans and Development Fund (LLDF) by the World Bank for loans to local authorities for both revenue and non-revenue generating projects (see Urban Sector Study p.65 for details). The Asian Development Bank is also becoming involved in institutional strengthening and financing of infrastructure in secondary towns. At the present time the ADB is processing a loan for the upgrading of municipal infrastructure and institutional strengthening in ten secondary towns in Bangladesh. USAID, through an urban sector Housing Guaranty loan, can also lend to local authorities for infrastructure and revenue generating projects as long as the majority of beneficiaries earn less than the median income.

e. Institutional strengthening. As mentioned in Chapter 2, one of the principal objectives of the proposed strategy is the strengthening of the key planning, management and implementation institutions, i.e., the UDA, the UPU and the local authorities.

In spite of the move to decentralize the planning functions, the activities of the UDA remain extremely centralized. The most recent organization chart, which is somewhat out of date, shows some seven divisions, five of which report to the Director General directly, the other two reporting through two Additional Director Generals. It seems that at least one other division, which is crucial to the operations of the UDA, could take steps to

decentralize, i.e., the Lands Division. This division deals with the purchase and conveyance of land, activities which essentially occur in the provinces.

In addition to having a rather cumbersome, centralized organization which is located in cramped quarters, most of the procedures of the UDA are still carried out manually. Only the Finance Division has completely computerized its operations. Although there are eight PCs, four are terminals of a somewhat outdated mainframe (Wang VS-45, 512K RAM, 90 megabyte hard disk). Most of the computer capacity is used for financial, administration and personnel reporting, with one computer in the Design and Project Management Division equipped with AutoCAD and a plotter. Significantly, there is not one computer in the Planning Division and none of its operations are computerized.

Although computers cannot solve all of the problems of the UDA, they can have a substantial impact on streamlining its operations - a necessary action in the context of government's devolution programme. In this same context, a technical assistance package should be considered to look at UDA's organization, functions, performance and Act, especially since it is supposed to be a self-financing institution, with a view to restructuring its operations to implement decentralized planning in the context of the adopted Urban Action Strategy.

With respect to local authorities, Government has decided to continue the IDA financed technical assistance provided through the UPU into a fourth phase. The technical assistance has several objectives, the principal of which will be to:

- Assess the existing capacity of the local authorities to implement devolved functions and determine technical assistance and training required to meet the devolved responsibilities.
- Integrate the development functions of the local authorities with those of the Provincial Councils.

Although the UPU is in the process of contracting the consultants, most of which will be local, to undertake Phase IV, there has been a substantial gap between the departure of the Phase III consultants in December 1989 (with most of the local consultants leaving in June) and the start up of Phase IV. Due to the lack of trained field staff, this hiatus has hampered the UPU in carrying out local authority support functions. In addition, a proposed decentralization of staff to the Provincial capitals has not occurred.

According to the Work Programme for Phase IV, one of the tasks to achieve the objective of integrating the development functions of local authorities with the Provincial Councils, is to design a format for the preparation of strategic development plans for local authority

areas. Since these plans will combine economic and physical aspects of development, this will be a definite overlap with the present effort of the UDA. Further, as the objectives of Phase IV quoted above are also similar to those of UDA's present operations, consideration should be given to coordinating, if not integrating, the efforts of the UPU and the UDA. Since the target local authorities of the two institutions are similar, if the UPU was integrated with the UDA, not only would funds be saved in the implementation of their respective functions, but also the economic/financial aspects of development planning, which are sorely lacking at the UDA, would get equal weight with the physical planning aspects.

2. Greater Colombo

a. Data base and map generation. As mentioned previously, data base generation and the subsequent mapping must be carried out at a different scale for Greater Colombo than that for regional centers and secondary towns. The next section indicates the urgent need to identify Greater Colombo's extended area of influence and the directions in which it has grown since the completion of the Colombo Master Plan in 1978

With the new generation of satellites and improved data processing techniques, satellite images can now provide fast and accurate access to urban data. Techniques are available to process satellite images from digital tapes or transparencies and prints on micro-computers to produce land use maps directly from the image. To do so, various Geographical Information Systems (GIS) and Computer Aided Design (CAD) software are used to digitize satellite images or enlarged photographic prints to draw maps at different scales.

GIS allows data to be directly tied to maps resulting in a geographic representation of data. Data on housing types, land uses, land tenure, infrastructure networks and capacities, etc., can be tied to a geographical reference point as small as a junction of two utility lines or as large as a city block or neighborhood. Although data must be input manually using database software, once this first stage is complete, queries can be made of the data and immediate results can be shown on a map of the city. In addition to ease of updating, once the original database is in place, GIS allows for monitoring changes in urban growth and for development control.

Since the system operates on a personal computer and works directly with AutoCAD, which is available at the UDA, it is not expensive. Annex 1 shows the processing cost of 'Spot' satellite image products and compares these costs, as well as time involved, to those using aerial photos, the former being only about one third of the latter. Since the estimated cost for the computer system and software (digitizer tablet, plotter and printer, and CAD or GIS system) of \$20,000 to \$25,000 is far less than the system the UDA is presently considering, it should be feasible for the UDA to take an initial step in this direction. As

mentioned previously, the Projects Division already has a computer equipped with a plotter and the Remote Sensing Unit is familiar with the technology. Thus, training of the necessary personnel in the use of the equipment should not be difficult.

In this fashion the UDA could begin the long overdue update of the Colombo Master Plan. It is the agency which possesses all the original data of the Master Plan, and in the process of updating the database, especially for those services which lie underground, it could assist the various local authorities of Greater Colombo in coordinating infrastructure investment by the line agencies. This would be a far more effective process than the present one in which UDA chairs an infrastructure coordinating committee which is using cumbersome map overlays for every section of the city - it has completed 5 of 26 sections in the last year - in order to map and coordinate infrastructure investment.

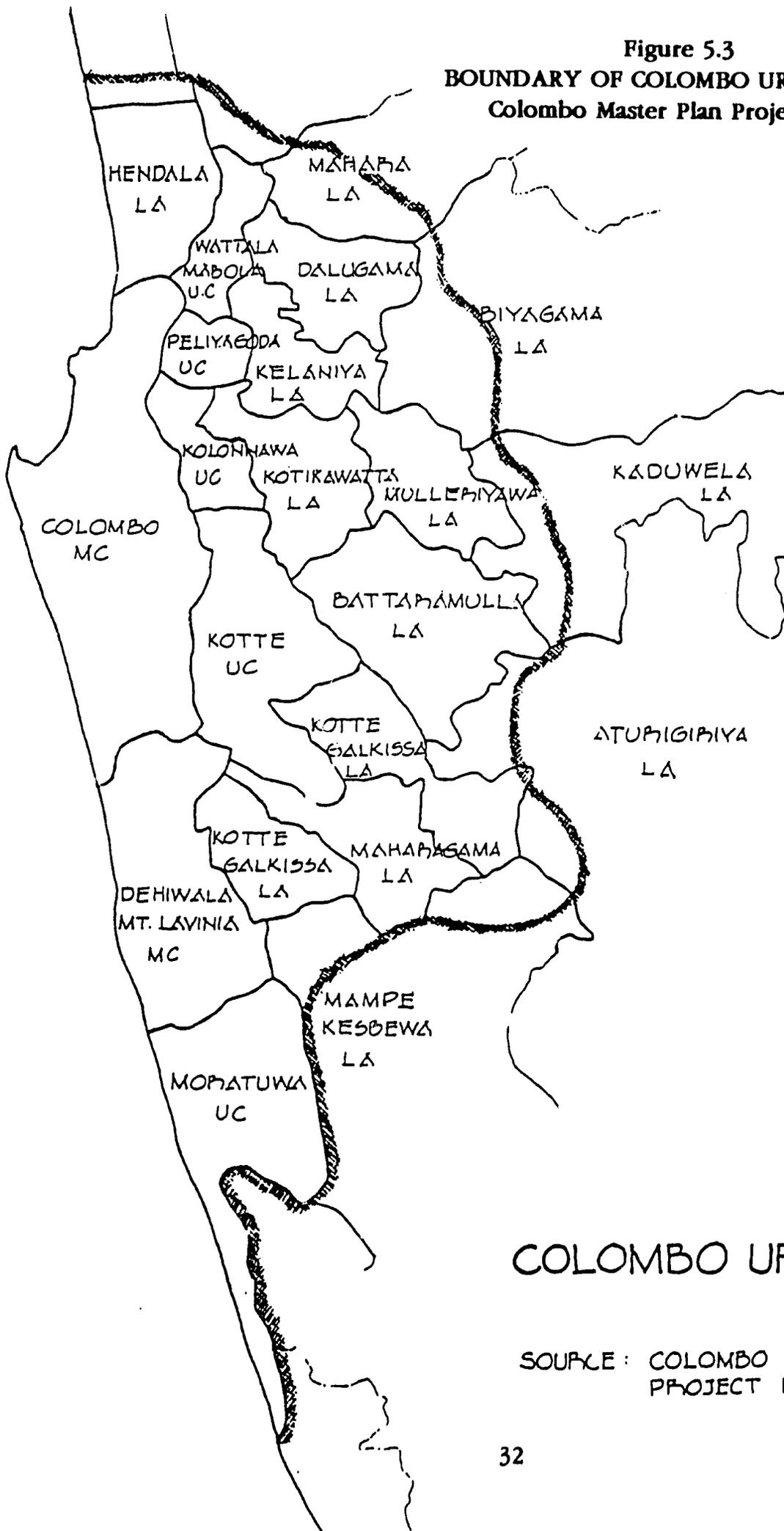
b. Identify area of influence. The next step in defining an urban development strategy for Greater Colombo would be to identify the city's expanded area of influence. Figure 5.3 shows the original boundary of the Colombo Urban Area as established by the Colombo Master Plan Project in 1978. It can be seen that the boundary, which was supposedly Colombo's area of influence at that time, ran through several local authorities. Today, some twelve years hence, it is uncertain where the boundary would be.

The Urban Sector Study cites several events of the past 10-15 years, which when taken together, underscore the need for the identification and formalization of an area of influence of Greater Colombo. These events include:

- Urban development pressure and accelerating conversion of agricultural land to residential, commercial and industrial uses in suburban local authorities;
- Creation of two major Government development programmes with jurisdiction over large tracts of land - the New Capital Project Development Area in Kotte to the east, and the GCEC area to the north;
- Proliferation of new development agencies with overlapping responsibility for various aspects of land development:
 - the Urban Development Authority
 - the National Housing Development Authority
 - the National Water Supply and Drainage Board
 - the Land Reclamation and Development Corp.

In the process of establishing a data base for Greater Colombo, a new boundary or area of influence of Greater Colombo could also be fixed. In this manner a spatial frame of reference for future planning and programming can be defined. This in turn could lead

Figure 5.3
 BOUNDARY OF COLOMBO URBAN AREA
 Colombo Master Plan Project 1978



COLOMBO URBAN AREA

SOURCE: COLOMBO MASTER PLAN
 PROJECT REPORT - APR. 1978

to the establishment of a Greater Colombo Planning Commission which could substantially ameliorate administrative and planning coordination problems in the metropolitan area.

c. Examine the feasibility of establishing an area-wide planning commission. The lack of a Greater Colombo metropolitan government has a significant impact on the coordination and implementation of planned urban development. Each of the some 16 local governments in the Greater Colombo area is responsible for the development and maintenance of secondary and tertiary infrastructure networks as well as local sanitation and health services, markets, cemeteries, slaughterhouses and bus stands.

Given that the Western Province is composed of two other districts, Gampaha and Kalutara, besides the Colombo district, it is doubtful that the Western Provincial Council can play a planning coordination role for the various local authorities of Greater Colombo. As a part of establishing a data base for Greater Colombo and identifying its area of influence, the feasibility of establishing an area-wide planning commission should therefore be examined. Such a body, which need not have a large staff, could begin to coordinate and establish linkages among the various local authorities that comprise Greater Colombo. Utilizing the data and maps generated in the foregoing steps, it could:

- begin to manage and guide peripheral metropolitan growth, based on the historical growth of the city as determined from satellite images;
- advise on the allocation of the Provincial and Decentralized Budgets such that the development of municipal services, such as community centers, markets, solid waste collection, etc., can be planned on a metropolitan basis;
- coordinate development of new land areas that overlap local authority boundaries;
- coordinate the development of primary trunk infrastructure between the line agencies and the local authorities;
- coordinate with the Ministry of Industries in the siting of new industrial estates taking into account market factors, off-site infrastructure, labor commutes, etc, and giving adequate representation to the private sector;
- coordinate with the CEA and other participants in any Metropolitan Environmental Action Plan (MEAP) undertaken as part of the Metropolitan Environmental Improvement Programme (MEIP).

The nucleus of staff for an area-wide planning body could come from the UDA's Environment and Infrastructure Systems Planning Unit which is presently headquartered at Kotte. At present this unit is in charge of not only all building applications in Greater Colombo, but also the present attempt at coordinating infrastructure investment in the metropolitan area. In addition, it works in close collaboration with the Land Reclamation and Develop-

ment Corporation in the maintaining the environmental aspects of reclamation of low and wetlands.

B. LONG TERM ACTIONS

Review, revision and approval of a formal urban strategy document, and the subsequent implementation of some of the medium term actions recommended above, will take some time. The following is therefore a brief list of actions which might be considered in the longer term.

1. Regional Centers

a. Provincial Structure Plan development. At present there are several attempts to formulate provincial development plans. However, the only one which contains any spatial aspects as to investment location is the Regional Development Plan for the Central Province, which has not been officially approved by the Provincial Council. If the effort of the UDA to integrate economic and physical planning at the local authority level is successful, as well as the appointment of Deputy Directors/Physical Planning in the offices of the Deputy Secretary/Planning of the Provincial Councils, efforts can then be made to develop or adapt structural plans for the provinces which integrate spatial with economic development aspects.

Related to this effort is the process presently underway in the Regional Development Division of the MPPi of doing resource profiles for all 283 AGA Divisions in the country. This activity is pursuant to the formulation of development plans for the AGA Divisions. However, in this exercise also, no spatial or physical aspects of development are being considered. At some point, perhaps at the completion of the resource profiles, consideration should be given to assigning a physical planning adviser to the RDD such that physical and economic integration can occur as the plans are developed.

b. Institutional strengthening of the PC Planning Units. At the present time there seems to be a lack of staff in Provincial Council Planning Units, let alone staff who are cadres of the Sri Lanka Planning Service (SLPS). Provincial development planning is suffering accordingly. In the future, therefore, as Deputy Directors/Planning (UDA) are posted to the provincial planning units, a series of training courses might be undertaken for the staff of these units on such subjects as data collection and processing, investment programming, prioritization of projects, project feasibility studies, industrial locational analysis, etc.

2. Greater Colombo

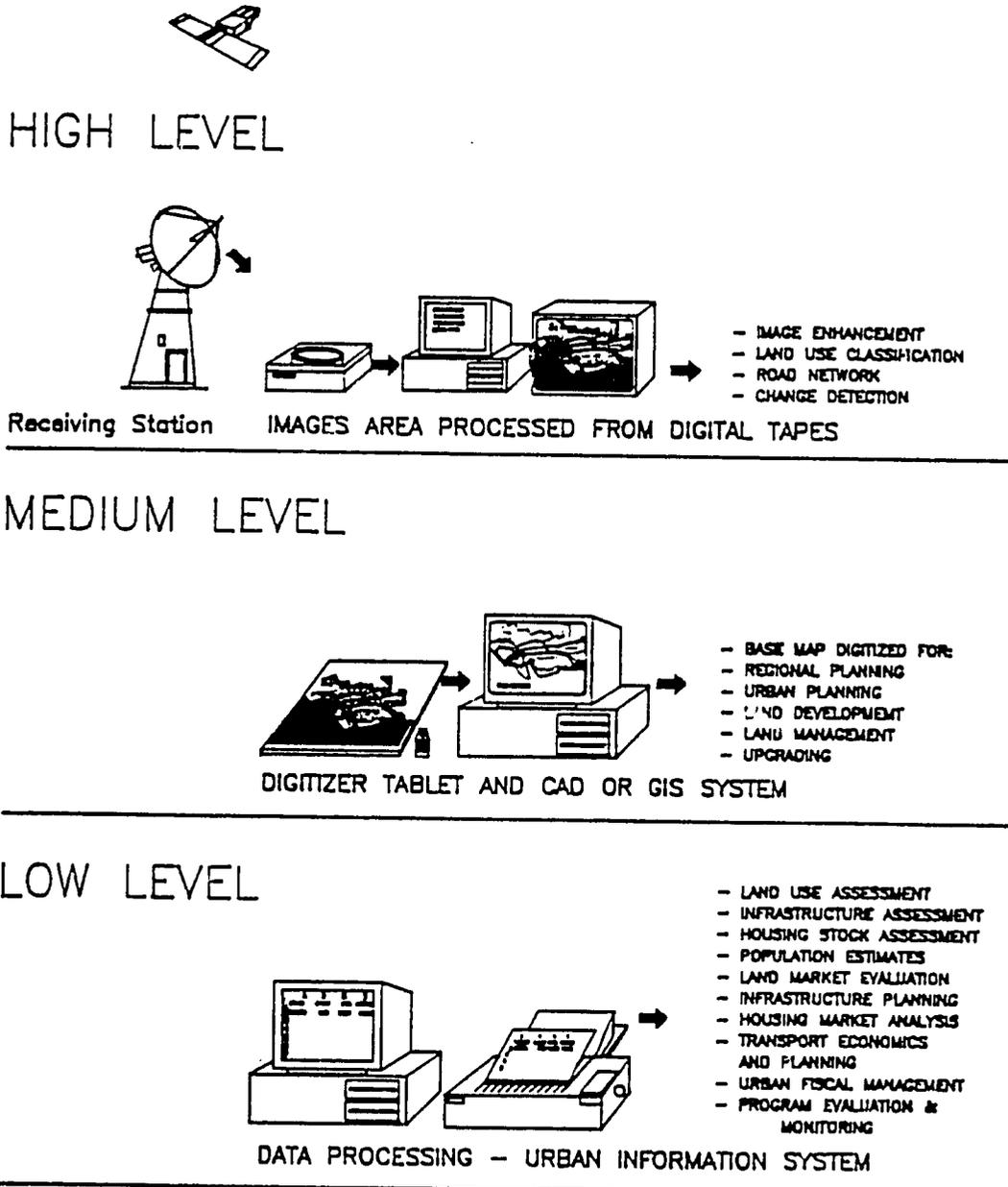
a. Update the Colombo Master Plan. Once the activities recommended in the medium term with respect to Greater Colombo are completed, the next logical step is to undertake a comprehensive update of the Colombo Master Plan. As stated several times, the present plan is a static land use plan of which the only active portion is the development controls aspect. Completed in 1978, the Plan has largely outlived its usefulness as a framework which can guide the sectoral investments which direct urban growth.

The same technology recommended for updating the urban data base can be effectively used to update the Master Plan itself. Satellite images can accurately show changes in the growth and fabric of the city. This technology has already been used to update the Karachi Master Plan and can also be applied to Greater Colombo. Technical assistance, which could be combined with that for strengthening the UDA, might be necessary for purchasing the equipment and training UDA staff in its use.

b. Establish a Greater Colombo Planning Commission. Concomitant to updating the Colombo Master Plan, steps should be taken to formally establish a Greater Colombo Planning Commission. Given the fact that the majority of the existing industrial base is in and around Colombo, if the present industrialization strategy of Government is a success, Greater Colombo faces a period of rapid industrialization. If the urbanization/industrialization process is not planned and guided by an updated Master Plan and an administrative authority created to implement it, the increase in urban problems and the deterioration in the quality of life will act as a deterrent to further development of the region. In an attempt to prevent this process, planning commissions in other large Asian cities, e.g., Karachi and Calcutta, have not only been created, but have been transformed into metropolitan development authorities.

ANNEX 1

FIGURE 2.8
REMOTE SENSING SATELLITE IMAGE DATA PROCESSING
AND THEIR APPLICATIONS
IN REGIONAL AND URBAN PLANNING



1. High Level of Data Processing

2.16 A high level of data processing involves the use of digital tapes and image processing software. This computer assisted method for enhancing satellite images allows one to better interpret urban features such as land use classifications. Most image processing systems offer the possibility to draw vectors and polygons over the image display on screen. This feature can be used to trace road networks and to produce thematic maps such as land use maps. Another useful application in image processing is merging existing computerized digital maps with an image. This technique is used in cartography to create or update maps and for change detection when using time series data.

2.17 Processing images at this level requires a good knowledge of image processing techniques and requires investment in computer hardware and software and training. The average cost of an image processing system running on microcomputer is in the range of US\$40,000 to US\$60,000. Companies specialized in the processing of remote sensing data do offer image enhancement and mapping services. Depending on the application, the cost per image or scene may vary between US\$10,000 to US\$24,000.

2.18 High level data processing techniques can be incorporated with medium level techniques as well, particularly for adding additional data for analysis.

2. Medium Level of Data Processing

2.19 A medium level of data processing involves the use of negative films or transparencies that are reproduced as photographic prints at various scales. Satellite image data are visually interpreted from the panchromatic or color prints. Land use and road maps are digitized directly from these prints at their scale. Using secondary sources other infrastructure networks (water supply, sewerage, drainage, etc.) can be superimposed on the road base map. This can form the basis for an urban information system.

2.20 Medium level data processing requires some knowledge of CAD (Computer Aided Design) and GIS (Geographic Information System) to digitize maps and to develop database programs for exporting data from maps into information systems for use in urban infrastructure and management models. This level of processing requires a microcomputer and peripherals (digitizer, plotter and printer) costing approximately US\$10,000 to US\$25,000 and the use of software such as CAD or GIS costing between US\$3,000 and US\$12,000.

3. Low Level of Data Processing

2.21 A low level of data processing involves using photographic prints made from films or transparencies. Satellite image data are visually interpreted and maps are manually traced from these prints.

2.22 This level of processing does not require specialized computer equipment nor skills since all spatial information would be produced manually, including the measurement of areas by planimeter. However, inexpensive micro-computers (costing between US\$2,000 and US\$3,000) can be used to process the data derived from the interpretation of the photographic print.

FIGURE 2.9
'SPOT' SATELLITE IMAGE PRODUCTS - PROCESSING COST
AND RESULTING OUTPUT

"SPOT" SATELLITE IMAGE PRODUCTS AND PROCESSING COST (1989 Cost in US Dollars)					
PROCESSING LEVELS	SATELLITE PRODUCTS	PRODUCT COST/UNIT	TYPE OF PROCESSING	PROCESSING COST	RESULTING OUTPUT
<p>HIGH LEVEL -----> Using digital tapes, satellite images are processed and enhanced with Image Processing software</p> <p>Computer system & Image processing software cost: \$60,000</p>	<p>MULTI-SPECTRAL DIGITAL TAPE (Color image) 20m. resolution</p> <p>PANCHROMATIC DIGITAL TAPE - (B&W image) 10m. resolution</p>	<p>\$1,700</p> <p>\$2,200</p>	<p>Digital tapes, multi-spectral and panchromatic are merged to improve resolution. Images are enhanced in order to enlight urban feature. Photographic printout of the enhanced images are comparable to high altitude aerial photos.</p>	<p>This type of processing cost approximately \$12,000</p>	<p>HIGH LEVEL:</p> <ul style="list-style-type: none"> - Enhanced image - Land use classification - Road network map - Change detection - Three dimensional image for terrain modeling
<p>MEDIUM LEVEL -----> Using prints made from panchromatic and multi-spectral films, maps are digitized with GIS or CAD software</p> <p>Computer system & software cost: \$10,000</p>	<p>PANCHROMATIC FILM (B&W) Negative transparency made from digital tape 10m. resolution scale= 1:400,000</p> <p>MULTI-SPECTRAL FILM (Color) Negative transparency made from digital tape 20m. resolution scale= 1:400,000</p>	<p>\$1,500</p> <p>\$1,300</p>	<p>Photographic enlargement: scale: 1:100,000 scale: 1:50,000 scale: 1:24,000</p> <p>Photographic enlargement: scale: 1:100,000 scale: 1:50,000</p>	<p>Print (B&W) \$65 \$100 \$350</p> <p>Print (Color) \$160 \$275</p>	<p>MEDIUM LEVEL:</p> <ul style="list-style-type: none"> - Land use and road computerized maps - Computerized overlay maps for water, sewerage drainage & electricity. - Urban Management System using GIS System.
<p>LOW LEVEL -----> Using B&W and/or color prints, maps are manually drawn</p> <p>Computer system & software cost: \$3,500</p>	<p>PANCHROMATIC FILM (B&W) Negative transparency made from digital tape 10m. resolution scale= 1:400,000</p>	<p>\$1,500</p>	<p>Photographic enlargement: scale: 1:100,000 scale: 1:50,000 scale: 1:24,000</p>	<p>Print (B&W) \$65 \$100 \$350</p>	<p>LOW LEVEL:</p> <ul style="list-style-type: none"> - Land use, road and utility maps drawn manually. - Urban Management System using LOTUS 1-2-3 and database management system.

E. Cost Difference Between SPOT Satellite Images and Aerial Photos

2.23 Using SPOT satellite images for mapping at a scale of 1:50,000 is less expensive than conventional mapping with aerial photos. Although it is too early to have precise figures from large surveys, IGN France (Institut Geographique National) reported a ratio of 3:1 in favor of SPOT data. The cost comparison presented in Figure 2.10 suggests this ratio is generally correct.

FIGURE 2.10

COST COMPARISON FOR MAPPING WITH AERIAL PHOTOS AND SPOT SATELLITE IMAGES

	Photos or Images Acquisition Price per Km ²	Staff	Total Cost * US Dollars
Conventional mapping using aerial photos	170 US\$	Surveying & Mapping 24 Person/Months	142,500
Mapping with SPOT satellite images	45 US\$	Surveying & Mapping 3 Person/Months	80,000

*Cost for mapping a coastal zone of 500 km² in Polynesia, Loyalty Islands at a scale of 1:50,000.

Study conducted by the French Hydrographic and Oceanographic Survey (Service Hydrographique et Oceanographique de la Marine), FOURGASSIE and LE GOUIC, 1987.

NOTE: Cost differences between aerial photos and satellite images are due not only to product cost but diverse processing techniques and significantly different timetables.

2.24 From this finding it can be concluded that SPOT satellite images, particularly panchromatic images with ten-meter resolution, offer an alternative to medium-scale aerial photos for urban planning purposes. It should be noted again that for tropical countries, image interpretability may be limited when vegetation obscures housing development. Another area where photo interpretation may not be possible is in desertic regions where houses are made of mud blocks and villages are dispersed without any visible roads to link settlements. Scale limits are also a constraint and Konecky in a 1987 UN publication "World Cartography" pointed out that "interpretability" is a factor which limits satellite images scale to 1:50,000 for cartographic uses. Such scale limits do not permit the use of satellite remote sensing products for cadastral purposes in urban areas.