

THE PROVISION OF LOCAL AUTHORITY SERVICES, PRINCIPALLY
ENGINEERING SERVICES, IN METROPOLITAN AREAS : A PERCEPTION,
AND A GENERALISED METHODOLOGY OF INVESTIGATION, ILLUSTRATED
BY A CASE STUDY OF GREATER CAPE TOWN

A thesis presented in fulfilment of the requirements for the degree of
Doctor of Philosophy (PhD)

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FACULTY OF ENGINEERING

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ABSTRACT

Kevin Charles Wall, The provision of local authority services, principally engineering services, in metropolitan areas : a perception, and a generalised methodology of investigation, illustrated by a case study of Greater Cape Town, PhD thesis, Faculty of Engineering, University of Cape Town, Dec 1982. (Address of author : c/o City Engineer's Department, P O Box 1694, Cape Town 8000.)

The provision of local authority services in many metropolitan areas is complicated by the problem of ill-fitting functions and areas. This is particularly so in respect of engineering services.

In the thesis, criteria of -

- efficiency and effectiveness;
- finance; and
- community participation;

are selected for use in an analysis of the situation.

The thesis critically examines alternative organisational forms for the provision of local authority services, particularly engineering services. These alternatives are assessed against a blend of the three criteria.

Analogous situations, both in South Africa and overseas, are reviewed in order to extract material. Relevant descriptions are

presented of selected metropolitan areas which have in recent years undergone major review of their organisational forms for services provision.

The nature of the various local authority services as a system is stressed, i.e. that efficiency and effectiveness in the provision of individual services (engineering or otherwise) cannot be divorced from similar considerations of other services nor from finance and community participation. A comprehensive multiservice multicriteria conclusion is reached.

A methodology of investigation is drawn up for use in generalised (i.e. non-specific-place) circumstances. The characteristics of the approach are -

- firstly a description of the services characteristics in the metropolitan area under investigation, paying special attention to aspects of co-operation, available resources, problem areas and the opinion of other researchers and practitioners;
- secondly an investigation, aided by a literature survey and further relevant data collection, of pertinent services characteristics in other areas which provide information applicable to the circumstances of the metropolitan area under investigation;
- thirdly an amalgamation of the preceding steps, in terms of the efficiency and effectiveness criterion only, and the drawing of tentative conclusions; and

- fourthly incorporation of the financial and community participation criteria, a setting out of the optimum organisation, and some remarks as to how the recommendations should be put into effect.

The need is stressed to tailor generalised models to the requirements of each individual area.

The generalised methodology is then applied to a case study area, viz Greater Cape Town, and a choice is made of a most suitable local authority services provision form. The recommended form would bring about services provision, particularly engineering services provision, which would be more efficient and effective and would also resolve many current and impending problems of finance and community participation. Reference is made to the City Engineer's Department's recent investigation into this subject, the work of the present author.

As a result of the application of the generalised methodology to the above case study, it is established that the methodology is sound.

The contribution to knowledge of the thesis is principally in respect of -

- the drawing up of the generalised methodology of investigation, the describing in depth of the methodology, and the examination and illustration of the methodology by its application to Greater Cape Town; and
- the highlighting of the systems nature of local authority services provision.

ACKNOWLEDGEMENTS

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- Messrs R Gentle and C Schuman who read and commented on drafts of the script.

Much of the material in this thesis was researched for a report which the author wrote for the City Engineer's Department, Cape Town. The permission of the City Engineer, Mr J G Brand, to use this material is gratefully acknowledged. The permission of the Director of Technical Management Services, City Engineer's Department, Mr N W Riley, to use his Branch's word processor, is also gratefully acknowledged.

Several of the figures are reproduced by courtesy of the City Engineer's Department, Cape Town. All art work is by Miss M Liebenberg, to whom particular thanks are also due.

DECLARATION

I, Kevin Wall, submit this thesis for the degree of Doctor of Philosophy. This thesis, my original work, has not been submitted in this or in any other form for a degree at any University.

Signed by candidate

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LIST OF ABBREVIATIONS

AWA	Anglian Water Authority
AWWA	American Water Works Association
CCC	Cape Town City Council
CED	City Engineer's Department
CEED	City Electrical Engineer's Department
CMPC	Cape Metropolitan Planning Committee
CPA	Cape Provincial Administration
DC	Divisional Council
DCC	Divisional Council of the Cape
DWA	(central government) Directorate of Water Affairs (South Africa)
ESCOM	Electricity Supply Commission
GCT	Greater Cape Town
GO	Government of Ontario
GVRD	Greater Vancouver Regional District
ICPRB	Interstate Commission on the Potomac River Basin
LRAC	Long-run average cost
mgd or MGD	Million gallons per day
Mld-1	Megalitres per day
MPO	Metropolitan Planning Organization (United States)
MTAB	Metropolitan Transport Advisory Board (South Africa)
nfa	no figure available
NSW	New South Wales
PTA	Passenger Transport Authority (Britain)
PTC	Passenger Transport Corporation (South Africa)
PTE	Passenger Transport Executive (Britain)
SATS	SA Transport Services
SAR	SA Railways and Harbours Administration
TATOA	Toronto Area Transit Operating Authority
TTC	Toronto Transport Commission
UME	United Municipal Executive (South Africa)
UMTA	Urban Mass Transportation Administration (United States)
USEPA	United States Environmental Protection Agency
WA	Water Authority (Britain)

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NOTE

The views expressed in this thesis do not necessarily reflect the views of the author's employers, the City Engineer's Department, Cape Town, nor the views of the City Engineer or the City Council of Cape Town.

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KEYNOTES

1. "DELOCALIZED" PEOPLE

H G Wells (1904) : "You will find that many people who once slept and worked and reared their children and worshipped and bought all in one area, are now, as it were, 'delocalized'; they have overflowed their containing locality and they live in one area, they work in another and they go to shop in a third. And the only way in which you can localize them again is to expand your areas to their new scale." (01)

2. CHANGE AND CRITICISM

"As Machiavelli said many years ago in a well known extract from The Prince: '... there is nothing more difficult to arrange, more doubtful of success, and more dangerous to carry through than initiating changes... The innovator makes enemies of all those who prospered under the old order, and only lukewarm support is forthcoming from those who would prosper under the new. Their support is lukewarm partly from fear of their adversaries, who have the existing laws on their side, and partly because men are generally incredulous, never really trusting new things unless they have tested them by experience. In consequence, whenever those who oppose the changes can do so, they attack vigorously, and the defence made by the others is only lukewarm.'

Most people who quote this passage stop there, but it continues: 'So both the innovator and his friends are endangered together.'"
(02)

I INTRODUCTION

1. Criteria and objectives
2. Local authority services provision forms in metropolitan areas : alternatives
3. Necessity for change, and approaches to change

II SYSTEMS AND METHODOLOGY

4. A deeper investigation of the nature of the efficiency and effectiveness criterion
5. The systems nature of services provision
6. The generalised methodology of investigation

III INVESTIGATION

7. The services investigation : individual services
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9. Case studies : general remarks
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V CLOSURE

14. Conclusions and commentary

1 CRITERIA AND OBJECTIVES

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1.1 BACKGROUND

1.2 CRITERIA

1.3 THE OBJECTIVES OF THE THESIS

1.4 PRECIS

Chapter objectives

The objectives of Chapter 1 are -

- to state the objectives of this thesis;
- to describe the format of this thesis;
- to state in general terms the problems encountered, by local authorities in metropolitan areas, of ill-fitting functions and areas of responsibility;
- to describe criteria suitable for a consideration of these problems; and
- for the convenience of the reader, to precis the thesis.

1.1 BACKGROUND

Metropolitan areas throughout the world are becoming relatively more important in respect of the growing proportion which they represent of their nations' populations, employment opportunities, economic and political power and practically all other indicators of development. The metropolitan areas are claiming a greater share of attention from both public and private enterprise; greater, that is, relative both to other urban areas and to the rural areas of the nation. The number of citizens is increasing, and their increasing needs and demands for services are prompting a search for improvements in the organisational forms of local authority responsibility for provision of these services. In most instances these forms are derived from an earlier age; problems of ill-fitting functions and areas exist. (The term "local authority services" is defined in Section 7.1.2 below.)

The weaknesses of many of these organisational forms lie in most instances in the following four principal directions -

- too great a disparity in size and resources between individual local authorities, arising mainly from local authority reform not having kept pace with an expansion and redistribution of the population;
- a fragmentation and overlapping of local authorities and other agencies charged with the provision of local authority services, and a haphazard allocation of functions;
- a failure to keep pace with the changing pattern of modern society and the new demands expressed by citizens; and
- an increasing central control that is eroding local authorities.

The pattern and character of local authorities must be such as to enable them to do four things -

- to perform efficiently and effectively a wide range of profoundly important tasks concerned with the safety, health and well-being (both material and cultural) of their citizens;
- to attract and hold the interest of their citizens;

- to adapt themselves without disruption to the present unprecedented process of change in the way people live, work, move, shop and enjoy themselves; and
- to develop enough inherent strength to deal with national, provincial and other local authorities in a valid working relationship. (101)

The most important reason for maintaining local self-government is its superiority to any other organisational structure in terms of its ability to identify many of the needs of the community and to satisfy these needs. (Section 8.3.3.1 elaborates on this.)

Furthermore, the cost function characteristics of the services operated by local authorities are with very few exceptions such that full or practically full exploitation of economies of scale can be obtained by operation within the metropolitan area or portions thereof. Attempts to operate these services over a wider area only bring with them problems of management and co-ordination which detract from the economies.

It should however be noted that organisational solutions do not help if the underlying problems are too great. Every investigation of organisation in local government should take care to consider what non-organisational measures might be of some assistance to the ultimate objective of improving local authority services provision. The investigator of change should also be warned (see "Keynotes") -

- that growth of urban areas requires expansion of administrative areas to suit; and
- that being an initiator of change is a hazardous occupation!

1.2 CRITERIA

Consideration of reform must attempt to meet three often conflicting criteria -

- efficiency and effectiveness;
- the need to act within available financial resources (finance); and

- citizen satisfaction through the reflection of community values in the process of local services provision (community participation).

A few words follow on each.

Both efficiency and effectiveness are often quantifiable. Efficiency measurements ask if inputs have been used to their best advantage. Effectiveness measurements ask to what extent the task in hand has been achieved. However an effective solution may be very costly and therefore inefficient. A cost-effective solution for the same problem may require reducing the effectiveness in order to lower costs to an acceptable level. Much depends on the circumstances and particularly on the nature of the objectives in each case.

The extent to which efficiency and effectiveness are achieved can vary considerably according to the size of the area being examined; boundaries of areas of jurisdiction may have to be adjusted to achieve the required performance. This is particularly the case with the provision of public goods and services. Relevant events are not uniformly distributed in space; rather they occur as sets under conditions such that boundaries can be defined with more or less (often less!) precision. For example, rivers flow in basins defined by watersheds. In other words, the required performance of many public services, especially those of an engineering nature, can be described in relation to specifiable boundary conditions. The criterion of efficiency and effectiveness requires that these conditions be taken into account in determining the scale of the public services organisation. If they are not taken into account, the organisation is unable to regulate the set of events which it needs to regulate in order to realise some preferred state of affairs.

If boundaries cannot be suitably adjusted, it might be necessary to transfer responsibility to an authority which operates at a more appropriate scale. For example, the boundaries of one local

authority may be too small to permit an effective response to an air pollution problem. The only effective solution for such a problem, which has a metropolitan range, may be for the matter to be dealt with by a metropolitan authority.

The most efficient solution would usually require measures to assure the producer of public goods and services that he will be able to achieve the most favourable economies of scale. For example, a lower tier local authority might not be able to achieve acceptable economies of scale with the small solid wastes pulverising plant which it could justify from its own solid wastes generation. However if it combined resources with adjacent local authorities or if the functional responsibility for pulverising and disposal of refuse were handed to the metropolitan authority, then acceptable economies of scale would be more attainable. The same may be true in the utilisation of uncommon or expensive professional skills; these factors can bear upon efficiency as a criterion of the scale of organisation needed. Obviously this applies particularly to the top management; at the very top of a large local authority a manager is required of a higher calibre than his counterpart in a small local authority.

Studies which take the quality of urban services into account have also shown evidence of economies of scale on certain services within certain limits. For example, the apprehension and prosecution of traffic offenders is facilitated by integrated command and communication, consolidated central records and facilities for officers to work in any part of the metropolitan area.

It might also be that the most efficient and effective solution is at the wider scale for the reason that this will enable several different facilities to be managed in such a way that the services of the one will be complemented by the unique potential of the other. For example, water from two water catchment areas, one with too-high acidity and one with too-low, could usefully be mixed.

On the other hand, efficiency and effectiveness might well in certain circumstances work in favour of the smaller scale of operation. Large organisations sometimes tend to become inefficient and ineffective purely as a result of their size and bureaucratic nature. In many instances, a case can be made for this and related reasons to be made out for a smaller unit of control.

The finance criterion demands that the authority providing the service balances its budget. If it cannot do this from within its own revenue, then it must have access to external sources. Public service agencies must live within their income. A problem facing many local authorities is that their major sources of income are generally speaking not keeping pace with the increased demands and needs for services. Pressure on services provision arises from an increasing population and a set of services some of which (e.g. cultural facilities, freeways, water) are very income elastic (i.e. the quantity and quality demanded increases faster than does the personal income of the consumer). There exists always the possibility of increasing income, either by increasing the property rate or by tapping non-traditional sources of income. However the first meets inevitable citizen resistance and the second requires the agreement of tiers of government higher than the local, and this agreement is not readily forthcoming.

The criterion of community participation requires the representation of the appropriate range of community interests in the decision-making arrangements. In respect of each act of services provision there is an appropriate community which needs to be identified, and this community usually varies from act to act. The direct participants in a decision are apt to negotiate only on behalf of the interests they represent, leaving the indirect consequences or spillover effects to impinge upon others.

Where the decision-making body does not reflect the value system of the whole community, some interests may be disregarded. For example, a disenfranchised section of the community might find that community facilities in its area are greatly lacking or inferior.

(Where this does not happen is a tribute to the fair-mindedness of the public representatives concerned.) On the other hand, where the decision-making body contains a large number of persons who are unaffected by and are simply not interested in the issue which must be decided, the real community interest might be submerged. In these circumstances this interest has no influence in the decision-making process, just as if it had not been represented at all. For example, the decision-making mechanism of a metropolitan council representing several million population is not appropriate for the planning of a local playground.

Problems of conflict among and within the criteria emphasise the nature of the various local authority services as a system.

Problems arise in that the criteria contain conflict among themselves.

In particular, the conflict between efficiency and the democratic aspects of community participation is a subject of heated debate. Efficiency, it is frequently claimed, requires restricting the participation of representative bodies (local councils) in public policymaking and especially in the execution of policy. Efficiency often requires larger authorities than are compatible with effective democratic participation. On the other hand, the same argument states that democracy requires local authorities to be small in order that people may be close to them, and that citizen participation may be relatively intense.

These generalisations are only partly true. There is a growing inclination to pursue a different line of thought. Democracy has become meaningless in many local authorities because of the incapability of small units to properly discharge their functions. As a result, higher authorities have to step in, and little is then left of the precious ideal of local autonomy. Increasing the size of local authorities to such an extent that they would be able to function efficiently and effectively would strengthen local authorities, and consequently local democracy.

The aim should perhaps be to secure that all functions are exercised by the lowest administrative tier consistent with efficiency and effectiveness. Or, as an American report expressed it: "Functions should be assigned to the level that maximizes conditions and opportunities for active participation and still permits adequate performance of service." (102)

Further problems arise in that these criteria contain conflict within themselves. For example:

- i) There is often conflict between efficiency and effectiveness. If resources are short, it is possible to have efficiency but to be ineffective. Conversely, effectiveness can be achieved at the cost of what may be regarded as a waste of resources and hence the effective solution is inefficient. It may also be that achievement of efficiency (or effectiveness) in one service prevents this achievement in another service. Furthermore, shortage of time might prevent either efficiency or effectiveness; a job done on a crash programme might cost twice as much as one done according to normal scheduling.

An illustration of the difference between efficiency and effectiveness can be seen in the provision of an emergency repair service for burst water mains or blocked drains. A most effective service could be obtained, in terms of response to calls, by having many repair teams on the alert at any time, but this would be an expensive answer, as it would maximise idle time. An efficient solution would be one which ensured the maximum usage of each team, which clearly implies that as few teams as possible be provided. This would have the inevitable result that delays would occasionally occur in the response to a call for a team. A decision must be made on the acceptable standard of service compared to the acceptable expenditure on the service.

- ii) Policies intended to improve the financial position of local authorities might in certain circumstances lead to the direct opposite, especially if the systems nature of services provision is not taken into account. For example, the imposition of a charge for solid wastes collection where it did not previously exist might in the short term increase the local authority's revenue. However in the long term the consequent reluctance of some sections of the population to use this service might lead to a health hazard which would require a medical programme, partly paid for by local authorities, to solve it.

Radical change in methods of raising funds, intended to improve the financial position, can have detrimental repercussions on land use or employment opportunities. For example, increasing the property rate in one local authority might lead in the long term to employers moving their business establishments to other local authorities nearby whose property rate is not as high.

It is often difficult for a local authority to know what are the available monies and the available charging and fund-raising options.

- iii) Different citizen groups may have different (perhaps radically different) demands of local authorities. A continual problem is how to determine the preferences of the different groups, how to measure their satisfaction with the services provided, and how to induce their participation in a constructive way in the community decision-making process.

An organisational form must be devised that is suited to the particular needs of the area being investigated.

Chapter 4 and Section 8.3 devote more attention to criteria.

1.3 THE OBJECTIVES OF THE THESIS

The full set of the objectives of this thesis is -

- to establish specific operational criteria against which proposals can be objectively assessed, and to outline the options that are available as a result;
- to obtain a perception of the service provision characteristics and particularly the difficulties which exist in metropolitan areas;
- (the "primary objective") to devise a methodology which should be used in the investigation of organisational forms for the provision of local authority services, especially engineering services, in any metropolitan area; and
- to examine this methodology and to illustrate its use by applying it to the specific circumstances of a suitable area (Greater Cape Town is chosen), and to modify it if necessary.

These objectives complement one another.

That Greater Cape Town is selected for the examination of the generalised (i.e. non-specific-place) methodology is motivated in Section 10.1 below.

The terms of reference of this thesis may briefly be stated as follows. The major contribution to knowledge of the thesis is intended to be its drawing up of a methodology of investigation, applicable to the circumstances of any metropolitan area, so that the organisation of the provision of local authority services, especially engineering services, may be optimised. Initially the process of drawing up the methodology uses in depth the efficiency and effectiveness criterion. Later in the thesis this criterion is blended with due consideration of the community participation criterion and also the question of finance, and the methodology is examined in the circumstances of Greater Cape Town.

It is as well to state at this early point in the thesis that each of the three criteria is affected, to a greater or lesser extent, by the social, cultural and political background against which services provision must be viewed in any particular instance. For example -

- while the thesis refers to efficiency and effectiveness concepts in wastewater treatment which are currently valid in Western countries, reclamation of wastewater for potable use might not be as acceptable in other cultures;
- financial concepts understood in this thesis would have to be reviewed in Eastern Bloc countries where, in the absence of private ownership of property, the constraint of revenue accruing from property rating does not apply, and other financial considerations are paramount; and
- concepts of community participation differ from culture to culture and from one political system to another; the meaning of the term "local government" must be qualified by a clear appreciation of for example the extent to which the economy of the nation is centrally planned.

The development in this thesis of the non-place-specific methodology is continually aware of the necessity for carefully checking the validity of lessons imported from particular circumstances. Similarly, the effect of local circumstances on the methodology must, in any application, be carefully taken into account.

1.4 PRECIS

Chapters 1 to 3 are introductory.

Chapter 1 introduces the topic and the major criteria, and states the objectives of the thesis. The chapter concludes with a precis of the thesis.

Chapter 2 discusses alternative organisational forms for local authority services provision in metropolitan areas.

Chapter 3 reaches the conclusion that rationalisation and redistribution of responsibilities for the provision of local authority services are from time to time necessary. The chapter discusses approaches to possible change.

Chapters 4 to 6 discuss criteria and systems, and set out the methodology of investigation.

Chapter 4 researches further into the efficiency and effectiveness criterion. It defines what (in general terms, i.e. not specific to an area) the investigator must look for. The concept and use of cost function characteristics are dwelt on.

Chapter 5 highlights the presence of a system, i.e. that efficiency and effectiveness in the provision of individual services (engineering or otherwise) cannot be divorced from similar considerations of other services nor from finance and community participation.

Chapter 6 sets out the characteristics of the methodology, viz -

- firstly a description of the services characteristics in the metropolitan area under investigation, paying special attention to aspects of co-operation, total resources, problem areas and the opinion of other researchers and practitioners;
- secondly an investigation, aided by a literature survey and further relevant data collection, of pertinent services characteristics in other areas which provide information applicable to the circumstances of the metropolitan area under investigation;
- thirdly an amalgamation of the preceding steps, in terms of the efficiency and effectiveness criterion only, and the drawing of tentative conclusions; and
- fourthly incorporation of the financial and community participation criteria, a setting out of the optimum organisation, and some remarks as to how the recommendations should be put into effect.

Chapters 7 and 8 give in-depth description of the methodology, its generalised application, and information sources.

Chapter 7 discusses and illustrates the assembly of evidence on the topic of rationalisation of organisational forms for local authority services provision. Particular attention is paid to the efficiency and effectiveness criterion as applied to and found in the services provision organisations of metropolitan areas. Information is

gleaned from a literature survey of descriptions of metropolitan areas in various parts of the world, including South Africa, but excluding for the moment studies specific to the area chosen for the case study. Emphasis rests very much on engineering services.

Particular attention is given to two well-documented case studies of local authority services provision in metropolitan areas. These are the Toronto form, instituted nearly thirty years ago and subject to periodic report and modification since then. The second is the process of local government change throughout England and Wales, the subject of an intensive study in the late 1960s and instituted, in a somewhat modified form compared to the investigators' proposals, in 1974. Common points are noted and arguments of particular relevance to the generalised situation are carefully studied.

Chapter 8 continues the work of Chapter 7, but switches from attention on individual services and the single criterion to the spectrum of all services and all criteria.

Chapter 9 tells how, in Chapters 10 to 13, the methodology derived thus far in the study was applied by the author to the case study context of Greater Cape Town.

Chapter 10 firstly motivates the choice of Greater Cape Town as a suitable case study, and then briefly describes present and proposed local authority services provision (especially for engineering services) in the area. Resources available, arrangements for co-operation between authorities, problems and achievements, and the involvement of other tiers of authority are among the principal aspects discussed and described.

In Chapter 11, the experience reported in Chapters 7 and 8 is matched and compared with that of Chapter 10. The conclusions drawn are an attempt at a distillation of the best of the available reported experience, vetted for the circumstances of Greater Cape Town. In this chapter only the efficiency and effectiveness criterion applies.

Chapter 12 demonstrates how criteria other than efficiency and effectiveness must be blended in and, in Greater Cape Town, the effect they have. A number of comments are made on implications of the proposals offered. The chapter proposes an optimum organisational form for local authority services provision.

Chapter 13 describes the further studies needed in Greater Cape Town before the proposals made in the previous chapter can be implemented. However these studies are not part of the thesis.

The last chapter, Chapter 14, briefly assesses the thesis against its stated objectives. It then formally states the contribution the thesis has made to knowledge. The chapter concludes with a commentary on a situation where application of the methodology is necessary.

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2 LOCAL AUTHORITY SERVICES
PROVISION FORMS IN METRO-
POLITAN AREAS : ALTERNATIVES

University of Cape Town

2.1 INTRODUCTION

2.2 SPECTRUM OF ALTERNATIVES

- 2.2.1 Three basic approaches
- 2.2.2 The one-authority approach
- 2.2.3 The two-tier approach
- 2.2.4 The co-operative approach

2.3 IN FAVOUR OF A METROPOLITAN APPROACH

2.4 INTEGRATION VS POLYCENTRIC FRAGMENTATION : ARGUMENT SUMMARISED

Chapter objective

Before engineering services provision may be discussed, it is important to set out certain general matters concerning organisational forms for local authority services provision in metropolitan areas. The objective of Chapter 2 is therefore to introduce the topic, including describing the spectrum of alternative forms which are in theory available.

2.1 INTRODUCTION

Vosloo summed as follows the "world-wide" local authority problem of "ill-adjusted functions and areas in terms of meeting the demands of its citizens. This crisis manifests itself in various ways:

- i) Local government areas often do not correspond to the material and cultural interests of needs or communities.
- ii) Services which should be functionally consolidated or placed in the hands of one authority are fragmented among several and thereby increase the difficulty of meeting comprehensively the needs of communities.
- iii) Many local authorities are too small, in size and revenue, and in consequence too short of qualified manpower and technical equipment, to be able to do their work properly.

Together, these defects often hamper the development of a satisfactory pattern of local government." (201)

The pattern of local government has an important bearing on two universally applicable guidelines for the assessment of organisational forms for local authority services provision. First, from the point of view of efficiency and effectiveness it has an important effect on the optimisation of service provision at the local level. Secondly, from the civic point of view the pattern has an important influence on the participation of the communities concerned in the process of local government. "Local government, it is often claimed, is the ideal school for democracy." (202)

A common cliché is that the "metropolitan problem" is one of "big problems and little governments". This is ascribed to the fact that these areas are economically and socially integrated to a large degree, but are politically and in terms of many services provision functions divided into many separate units.

In this thesis, the term metropolitanisation is applied to a specific process of local authority reform. It is seen as a means whereby the quality of local services provision may often be improved by means of scale enlargement, while maintaining close liaison with local interests and groups. It implies the creation of some larger units involving to a degree the functional and structural consolidation of a number of neighbouring local services provision arrangements. These larger units are defined by the technical, geographical, sociological, administrative and political circumstances of a particular situation. Metropolitanisation does not debar for lower tier authorities the retention of or even increase in responsibility for selected services.

There are various techniques by which metropolitanisation can be achieved. These range from complete consolidation of functions and structures (i.e. total integration) at the one end of the spectrum to partial and fragmented functional co-operation (i.e. co-operative polycentrism) at the other.

2.2 SPECTRUM OF ALTERNATIVES

2.2.1 Three basic approaches

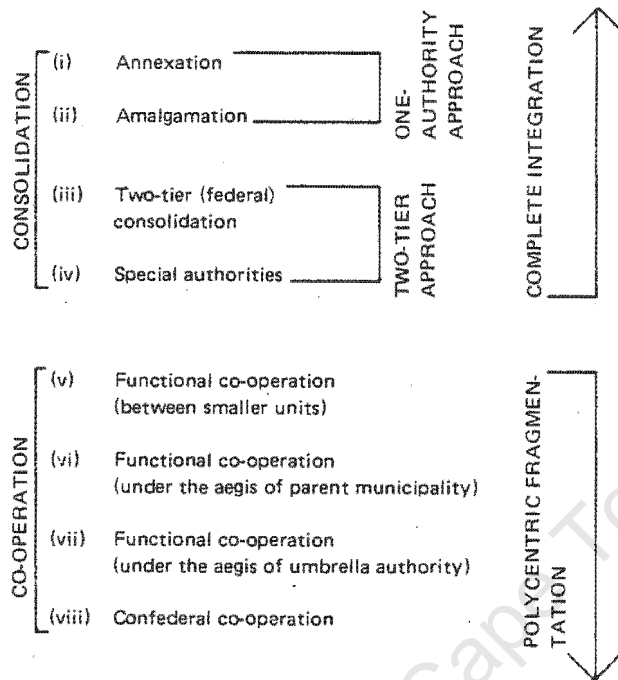
The description which follows is an amalgam of analytical frameworks described by, inter alia, Vosloo (203) and Oosthuizen. (204)

Choices lie on the spectrum illustrated in Figure 2.2.1A.

Section 2.2 gives a short overview of the different responses to metropolitan challenges which involve a significant change in the structures of authorities. The comparative framework followed should illustrate the advantages as well as the problems of conceptualisation.

There are three basic approaches to the analysis of metropolitan organisation, viz. the one-authority approach, the two-tier approach and the co-operative approach.

FIGURE 2.2.1A
APPROACHES TO METROPOLITANISATION



2.2.2 The one-authority approach

This entails the consolidation of two or more local authorities into a single larger unit on the lower level, without significant changes in the type of authority and its functions.

This consolidation alternative can be accomplished by either of two basic techniques:

- i) Annexation, i.e. the incorporation of smaller local units in adjoining larger units, either voluntarily or at the instance of a higher authority. Just about every city or town in South Africa in metropolitan areas has expanded by this method at some time or another.
- ii) Amalgamation, i.e. the fusion of two or more contiguous units to form a new, more inclusive (perhaps metropolitan) local authority. This type of consolidation usually faces the obstacle that independent local authorities are seldom prepared to amalgamate voluntarily.

Consolidation of a sort can also be achieved by the transfer of local functions to a higher tier of authority altogether. This tier could be a provincial administration or a central government.

The major objections to consolidation are the transfer of power away from decentralised decision-making, and the loss of local participation and accessibility for the individual.

The major advantages of consolidation are that a single authority has both the powers and territorial size to tackle problems in a comprehensive way, that economies of scale facilitate lower unit costs, that duplication and poor co-ordination can be avoided, and that financial resources can be applied where most needed.

2.2.3 The two-tier approach

The basic principle pursued in this approach is that in the distribution of powers and functions a distinction is made between the appropriately metropolitan matters on the one hand and on the other hand the matters which should be the concern of a subsystem of local authority units. Area-wide functions (one or several) are delegated to area-wide authorities, while purely local functions remain under local control, thereby creating a metropolitan/local or two-tier form.

The advantages of this approach are -

- the assignment of functions to the appropriate tier facilitates their optimum handling with respect to planning, decision-making and scale of operation;
- the local authority with its greater immediacy and opportunities for individual participation is retained; and
- there is now a forum for the effective area-wide planning and co-ordination of approaches to common problems.

The two-tier system can take two basic forms:

- iii) Two-tier (federal) consolidation, i.e. the consolidation of a number of municipalities (e.g. in a metropolitan area) on a two-tier basis under the aegis of an area-wide (e.g.

metropolitan) authority, but with the retention of partial autonomy for the localities concerned. Examples of areas where this technique has been applied are Toronto and Greater London. In some cases, a parent municipality formed the nucleus of a consolidation plan, while in other cases consolidation was achieved under the aegis of a rural authority (e.g. a county or district authority). In the Slater Report it was recommended that the Divisional Council of the Cape (hereinafter often abbreviated DCC) become a metropolitan authority for the Cape Peninsula. (205)

This approach therefore involves the creation of an entirely new area-wide organisation which is charged with carrying out numerous area-wide functions. The original local authorities (perhaps modified in some way) continue to operate and perform local functions that are not performed by the metropolitan tier. (The area-wide organisation could involve full-fledged representative government or be merely a services organisation with as non-political control as possible, or some variety in between.)

The two-tier approach, involving as it does a middle-of-the-road compromise of the criteria set, is regarded by many urban specialists as the most logical form of organisation for metropolitan areas. However there are certain potential disadvantages such as relative complexity and the possibility of undermining local autonomy via the gradual transfer of functions from the local tier.

Oosthuizen noted that the Toronto experience conveyed "four messages, viz -

- metropolitan-orientated problems such as the provision of services and housing were the major driving forces towards administrative restructuring;
- statutory powers and representation provide the necessary teeth to implement decisions;

- the trend in the two-tier system has been the transfer of more and more functions from the local tier to the metropolitan - i.e. opposing values can never be completely reconciled; [and]
- a willingness and openness towards adjustment and revision is possible in such a system and contributes substantially to the success of the organisation." (206)

iv) A second type of the two-tier approach is the special authority or ad hoc authority. This is a special institution created for the performance of a specific function or the rendering of a particular service at the regional or interjurisdictional level. Special authorities are one of the most common types of services authorities in the world. In 1972 there were almost 40 000 in the USA alone. (207) Some examples in South Africa are the Rand Water Board, ESCOM and the regional water services corporations in Natal.

The creation of a special authority affects the autonomy of existing local authorities in respect of their performance of this service (if they were previously responsible for the service) and sometimes in respect of the control which performance of that service gives over other development.

A special authority usually encompasses a substantial part of or the entire geographic metropolitan area, is autonomous and has statutory standing, has its own borrowing and sometimes taxing powers, and is normally authorised to perform only one service or a few closely-related services.

Special authorities as a form of metropolitan organisation have their origins to a large extent in a reluctance to disturb existing local authorities, while faced with the need to cater for the area-wide nature of so many services. Their creation does not usually require constitutional changes to existing local authorities. However a multipurpose body has an important advantage over a special authority; it facilitates the establishment of

priorities between services in the sense that it is able to retain a perception which tends to get lost given a multitude of single-purpose bodies. All urban services should be regarded only as means to achieve social goals; an excellent service is not an end in itself. For this reason special authorities are not generally regarded as presenting a systematic problem-solving capability.

Since special authorities are predominantly single-purpose they function independently from each other within a particular metropolitan area. As a result co-ordinated and comprehensive inter-service planning and action suffer. Only where special authorities form part of a comprehensive metropolitan organisation and where formal co-ordination is possible do they properly merit a place. Because they are (generally) governed by persons not directly elected by the local community, they are (again, generally) not accountable to those served. It is often the case that their objectives differ in both broad scale and detail from the objectives of the community.

The topic of single-purpose authorities is dealt with further in Sections 5.1, 8.2.4.2.4 and 8.3.3.2 hereunder.

2.2.4 The co-operative approach

This represents a voluntary technique for confronting metropolitan problems while at the same time maintaining local control.

Several forms of co-operative effort can be distinguished.

- v) The first is functional co-operation under interjurisdictional agreements, i.e. a cluster of local authorities concludes agreements in connection with the joint supply of services. Several contiguous South African municipalities have entered into agreements of this nature. These agreements are usually voluntary and not necessarily of a permanent nature. Even municipalities with deep-seated socio-cultural and other differences can conclude agreements for interjurisdictional co-operation without forfeiting local autonomy.

vi) The second is functional co-operation under the aegis of a parent municipality, i.e. a parent municipality by agreement renders certain services to surrounding satellite municipalities. Examples of this form of co-operation are the services supplied to certain surrounding municipalities by the City of Cape Town (hereinafter often abbreviated CCC); among these services may be listed water, electricity and wastewater treatment. In these cases, too, the autonomy of individual municipalities remains intact except in respect of the service in question and the control which performance of that service gives over other development.

vii) The third is functional co-operation under the aegis of an umbrella authority, i.e. specific functions or services are undertaken by the umbrella authority on behalf of other municipalities. Examples are housing and certain health services provided by the Divisional Council of the Cape on behalf of Goodwood, Parow, Bellville, etc. The autonomy of the local authorities in respect of all their remaining functions is unaffected.

"Agency" agreements also exist involving a lower-tier authority undertaking some service on behalf of a higher-tier authority or vice versa. An example in South Africa of the former is the housing function of the municipalities on behalf of, and funded by, central government.

viii) The fourth is confederal co-operation, i.e. the creation of associations of neighbouring local authorities. These associations are formed on a voluntary basis with a view to the studying of and making of recommendations concerning matters of common concern. Examples are the Cape Metropolitan Planning Committee (CMPC) and the Metropolitan Co-ordinating Committee for the Central Witwatersrand (Metrocom), both concerned with spatial planning. Confederal bodies usually have no executive powers and have to rely on the voluntary co-operation of the participating authorities.

The degree of formality of agreement varies. Formal contracts are often entered into between local authorities according to which one local authority renders services to one or more other authorities, or where two or more local authorities tackle projects together. In this respect the core city usually plays a predominant role since it has through the years attained the financial ability and expertise which enables it to render services on a wider basis.

This approach is popular because it is simple and because many authorities have limited capacity for problem solving. However, these arrangements are not always effective when dealing with complex problems such as low-cost housing and environmental protection. The desire to retain independence often limits the willingness of local authorities to enter into agreements.

Metropolitan councils, such as that in Durban, are permanent associations of government that meet on a regular basis to discuss and reach agreement on mutual difficulties and needs.

The most typical form of metropolitan council in the United States is the so-called council of governments (COG). Most of these COGs originated as a direct result of the federal government's requirements for comprehensive regional and metropolitan planning, although some were in existence before. Typical examples are the COG of Portland Maine, and the Southern California Association of Governments. (208) Zimmerman picturesquely dubbed the advocates of this form "the ecumenicists ... [who] hold that metropolitan exigencies can be solved by inter-local cooperation within the existing governmental framework." (209)

A more advanced type of metropolitan council is represented by the Twin-City Metro-Council of Minneapolis-St Paul. This umbrella-type agency co-ordinates and directs metropolitan development and has taxing powers.

The major complaint against these four forms of voluntary co-operation is that they have difficulty in being comprehensive and efficient, since participation cannot be forced and statutory powers are normally lacking. Furthermore, depending on the range of services with which they concern themselves, they are often vulnerable to the same criticism that is levelled at single-purpose authorities.

Less formal agreements may consist of no more than the exchange of information by local government officials. Another alternative is an agreement by individual local authorities to voluntarily consult each other before taking action on certain defined matters which have potential externalities. These informal agreements suffer to an even greater extent the limitation that they lack the power which might be necessary for mutually beneficial action.

2.3 IN FAVOUR OF A METROPOLITAN APPROACH

The strongest single motivation for a metropolitan approach is the widening and growing intensity of interrelationships and interdependencies (inter alia physical, economic and social) within the metropolitan area. An essential need is therefore for co-ordination and co-operation. In the South African context, the metropolitan transportation advisory boards, the guide plan committees and the regional character of bodies such as ESCOM and regional water authorities such as the Rand Water Board (to quote a few examples), indicate an awareness that there are needs overlapping those of the separate local authorities.

A dilemma exists. On the one hand certain functioning considerations and economies of scale exert pressure for larger local authorities or an additional government or co-ordination tier. On the other hand the complaint is heard that many existing local authorities are already too big for meaningful community representation and participation. This complaint rests on the argument that increased jurisdictional size leads to decreased access to public officials and representatives as well as to reduced attention to local communities, while rates vanish in a broad budget

without the ratepayer knowing how his particular environment benefits thereby. Furthermore, the larger jurisdiction is impersonal and not conducive to the development of a sense of community; interest and involvement are built up on the local level within the smaller identifiable group. These opposing views both have merit. Hence possible solutions for present shortcomings must be sought in a redistribution of functions.

Metropolitan organisation should in the first place address itself to issues which are metropolitan in nature, i.e. of sufficiently large scale to be important to the entire area.

From the objective to co-ordinate stems a need to direct and control development. Guidelines and criteria have to be set for what is happening at the lower levels in both the public and private sectors. This calls for the establishment of priorities between alternatives. It also implies the capacity for implementation of measures taken.

Metropolitan organisation should have as an objective on the one hand the reduction of negative externalities both on the regional or local level and on the other hand the promotion of positive action from which the entire urban community could benefit. What happens in one local authority area could harm or benefit another. With conflicting objectives amongst different groups an equitable approach is not easy and for this very reason a metropolitan approach often becomes essential.

Through a metropolitan approach the co-ordination of the financial resources of the metropolitan area as a whole could become realisable. Because of the non-homogeneous distribution of activities and socio-economic groups within the metropolitan area, certain areas provide revenue income in excess of their needs while in other areas the expenditure exceeds the income.

The provision of certain services is better achieved through a metropolitan approach. Typical is the need to control air or water pollution or to provide mass transport, highways, and bulk water

supply. In the absence of an organisation or authority charged with the responsibility for rendering these services on a metropolitan scale, it is often found that shortcomings in these services, although they may attract attention, often do not lead to effective action until a point of crisis has been reached.

More weight in bargaining with higher authorities is generally available to the metropolitan area as a whole than that which may be obtained as the sum of the weights of the local authorities acting individually.

The provision of services on the metropolitan scale is closely associated with considerations such as the exploitation of economies of scale, the avoidance of duplication of effort, and the rationalisation of use of sophisticated systems, technical equipment, skilled personnel and specialist facilities. These are all considerations which have a bearing on unit costs, operational efficiency, and effectiveness.

Metropolitan planning tends to be a natural starting point for a metropolitan consciousness. Land use and transportation planning, together with development strategies, all in the form of broad guidelines, invariably form some of the major functions of metropolitan co-operative organisations. Other major functions may include the provision and management, at the metropolitan scale, of information systems on planning and infrastructure, solid wastes removal, wastewater treatment, water pollution control, flood control and drainage, major roads and public transport.

It will be noted that, whereas only engineering services are quoted as examples above, many non-engineering services share the need for a metropolitan approach.

These matters are elaborated upon elsewhere in this thesis, initially in Section 3.1.4.

2.4 INTEGRATION VS POLYCENTRIC FRAGMENTATION: ARGUMENT SUMMARISED

It is often argued that an integrated local authority structure makes for more efficient and cheaper services. More specifically it is said to have the following advantages -

- it improves the quality of local authority services through co-ordination, large-scale operation and specialisation;
- it eliminates unequal financial burdens because not all local authorities in any particular densely populated region contribute equally to the provision of recreation facilities, roads, parking facilities, housing schemes, health services, etc., whereas the benefits of these services are enjoyed on a regional basis;
- it removes obstacles to comprehensive policy formulation on a regional basis, since the presence of many independent authorities hinders consensus; and
- it simplifies and streamlines fragmented and overlapping jurisdictions.

There is often strong opposition to attempts at consolidation, which is viewed as opposing deeply rooted local sentiments, social considerations, political considerations and vested interests. Cheapness of service is not regarded as the only valid criterion of efficiency in the functioning of local authorities. More specifically, the following advantages are ascribed to a fragmented structure -

- it plays a key role in the promotion and preservation of a sense of community identity and local autonomy;
- it provides an accessible forum for participation at a decentralised level in the process of government;
- it affords homogeneous groups the opportunity of preserving and protecting their own lifestyle and making their own choice of services priorities; and
- it affords great opportunities for the resolution of intergroup conflict, especially in deeply divided societies where strong discordant factors are present, such as differences of religion, language, culture or race, in that a polycentric structure reduces situations that give rise to friction and instead contributes to a greater sense of security and harmony.

One of the main attractions of the co-operative approach is that it provides an opportunity for dealing with area-wide problems on a voluntary basis while retaining local determination and control over appropriate functions. It does not threaten existing local authorities or the jobs of incumbent local officials. Yet it at the same time enables achievement of the economies of scale and the provision of specialised services that only a larger unit can make possible.

The relationship between efficiency and size is important. The argument that the efficiency of many local authority services increases with the size of the organisation providing them, is sometimes challenged. Evidence is that there are in respect of many services, beyond certain points, decreasing returns to scale. Few people would make simplistic equations between size and efficiency, since there are so many ways of measuring efficiency. Research studies have often failed to show statistically demonstrable correlations between population size, efficiency and cost. (A generalised discussion of cost functions in the theory of production is conducted in Section 4.2 below.) Moreover, there are numerous means by which the efficiency of small local authorities can be enhanced without the creation of large integrated regional units. Amongst these means are interjurisdictional co-operation, the widening of the financial tax base through revenue sharing, and the possibility of deconcentration to small local units (i.e. using these units as agents of "higher" authorities to perform local tasks).

Furthermore, if a multifunction authority is to be considered, the problem must be faced of different services exhibiting different efficiency characteristics as size increases. This is not an argument against metropolitanism, but it is a major issue to be settled before a multifunction authority can be established. (The topic is dealt with in greater detail in Section 5.2.)

The above matters are further considered in greater detail in Chapters 7 to 12 of this thesis.

"The traditions of local government are almost everywhere very strong and as a consequence, extremely resistant to change. Root-and-branch reform of local government is a rarity, even where existing structures are patently inadequate and outmoded. As a result stop-gap measures are much more readily used, such as the creation of ad hoc authorities and the encouragement of interjurisdictional co-operation." (210)

Only rarely (e.g. Toronto and Britain in the 1960s) has the matter been investigated as it should be, by means of a comprehensive, well-researched and rigorously argued series of reports.

Only once has an investigation of the necessary depth and comprehensiveness been completed in South Africa. This investigation, in respect of Greater Cape Town (hereinafter often abbreviated as GCT), was the work of the present author, under the guidance of the City Engineer. The resulting publication was entitled Organisational reform of local government services in Greater Cape Town (hereinafter referred to as GCT reform). (211)

3 NECESSITY FOR CHANGE, AND APPROACHES TO CHANGE

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3.1 CHANGE IS NECESSARY

- 3.1.1 Factors for change
- 3.1.2 Factors inhibiting adaptation to change
- 3.1.3 Size-, quality-, externality- and organisation-related aspects of finance
- 3.1.4 Compelling reasons for metropolitan co-operation

3.2 APPROACHES

University of Cape Town

Chapter objectives

The objectives of this chapter are -

- to discuss the necessity for change from time to time to existing arrangements for providing local authority services in metropolitan areas, and
- to discuss approaches to possible change.

3.1 CHANGE IS NECESSARY

3.1.1 FACTORS FOR CHANGE

Existing governmental and administrative arrangements for providing local authority services in metropolitan areas have come into being as a result of many design and implementation decisions in the past. Assuming that these arrangements were "perfect" when designed (an assumption which may not be correct, depending on the competence and the luck of the decision-makers of that time), it is almost inevitable that they have with the passing of the years become inappropriate to a greater or lesser degree. For example, governmental ideals may have become blurred, administrative difficulties may have increased, and shortages of resources, especially finance, may have made old methods no longer optimal. The influence of most of these factors has been gradual and cumulative; hence those in close contact with the existing arrangements, particularly the appointed officials and the elected representatives, have not necessarily seen the need for change.

This chapter sketches the initial steps of an assessment of the need for change in any instance, and of what change should be made. Firstly a listing is made (Section 3.1.1) of the factors which bring about the need. Secondly a listing is made (Section 3.1.2) of factors inhibiting adaptation to change. Thirdly a listing is made (Section 3.1.3) of pertinent factors related to financial difficulties of metropolitan areas. Only after these facts have been viewed (Section 3.1.4) can the attempt be made (Section 3.2) to state what must be done to modify the existing local authority forms to meet the challenges.

The principal factors for change are likely to be as follows:

The first factor is population growth and urbanisation. Many large cities have overrun their original boundaries and have sprawled out into the countryside and/or spawned satellite towns. Governmental jurisdictions and spheres of authority have been obscured. Old

organisational forms for services provision have perforce been altered and new ones have been slow to develop.

The second factor relates to the nature of the population. Demand is increased by the greater sophistication of the population; this adds further to the burden of services authorities. In South Africa, the rising financial power and quality of life expectations of the Non-Whites are of special importance. Furthermore, some needs of special groups, such as the elderly and the poor, are newly recognised, and special measures to cater for them are required.

The third factor is the greater demand by more people for participation in, not necessarily government as such, but certainly in the allocation of the costs and benefits of government. This trend is influenced by local and national politics and the institutionalisation of interest and common bond groups.

The fourth factor is the development of new values and attitudes, influenced by new methods of communication.

The fifth factor is the growth in scale of private and public institutions.

The final factor, related to all the others, is the pressure on local authority financial resources. Local authorities the world over are faced with demands for services which they are unable to afford.

The initial function of authorities is to assess the needs and aspirations of the people within their area of jurisdiction. The authorities are there to perceive these and to give direction with laws/ordinances and by budgets and expenditure programmes. Conflict situations exist constantly. Politics is the resolution of the conflict.

It is through expenditure that priorities are expressed. If money is spent on roadworks for example this amount can be expressed in

terms of alternative expenditure on health or recreation facilities. If expenditure is incorrectly allocated, i.e. inefficiently, or not in accordance with public needs however expressed, then reasons for this must be investigated.

3.1.2 FACTORS INHIBITING ADAPTATION TO CHANGE

It might well be found that a substantial and worthwhile improvement could in theory be made if the local authority services provision form were changed. (The term "changed", as read here, should include nuances such as "modified", "adapted" and "improved.")

Therefore change must be investigated, beginning with identification of factors inhibiting adaptation to change. These are:

- i) The fear of uncertainty often leads to working by precedent and the defence of the status quo.
- ii) Lack of knowledge is a second factor. For example, before any proposed change is made, no-one, be he official or citizen or elected representative, has full knowledge of the costs and benefits, both social and private, of that action. There may be even less knowledge of the consequences of some alternative action or of the "no-action" option.
- iii) "Sufficient" money is never available to local authorities. Postponed expenditure in the past created problems for the present; serious backlogs, for example in the provision of wastewater treatment, cannot but add to future troubles. Thus fear of aggravating the financial situation may be a third factor inhibiting change.
- iv) Finally there is a general lack of commitment to future interest. It is often fair to say that, for politicians and officials alike, popular present steps take precedence over future benefit. Politicians, who are dependent on periodic re-election, are frequently swayed by the knowledge that

spectacular benefits now will show that they are doing something. Unspectacular steps do not attract attention. Worst of all are unpopular present steps, even if they are for the long-term good.

Organisational change may, by its very nature, cause certain and quantifiable present cost in the interest of uncertain long-term advantage. In respect of, for example, the provision of physical infrastructure, the advantages of jurisdictional consolidation are slow to manifest themselves. With few exceptions, the consolidated authority will continue to use the existing plant even if it is over-size or badly located. Only when replacements or altogether new plants need to be built can plant size reflect the potential for economies of scale which is available to the consolidated authority.

3.1.3 SIZE-, QUALITY-, EXTERNALITY- AND ORGANISATION-RELATED ASPECTS OF FINANCE

That local authorities have increasing difficulty (in the long term if not also in the short term) in financing the demand for services, is due to -

- size
- quality and
- externalities

factors. Related to all of these are the often inadequate organisational forms.

In all countries, central and provincial (or their equivalent) governments grant or loan to local authorities considerable sums of money for capital expenditure on specific services. The services chosen usually include housing development and associated infrastructural and community facilities, major roads, and regional recreation facilities. These governments also subsidise certain operating expenditure, usually for health, housing and recreation.

User charges for services rendered, directly related for each consumer to the amount of the service consumed, in most metropolitan

areas cover a substantial proportion of the costs of rendering the services. However the shortfall, after user charges have been made and grants or loans have been received from the other tiers of government, is met in most cities by a tax on fixed property. This tax has the advantages of certainty, stability, convenience and economy of collection. On the other hand, it possesses several disadvantages. For example, as it is usually administered, it is relatively inelastic compared to rising costs.

"The financing of municipal services in the great city presents a problem of very great difficulty. ... Why do the slums of Harlem and the badly lighted, poorly paved streets of Chicago persist in the world's richest country? Why are the transport and traffic facilities of nearly all metropolitan areas unable to meet the travelling needs of the inhabitants with reasonable comfort and expedition? One could go on to ask many similar questions about other functions and other great cities." (301)

Robson noted that: "The reasons for these shortcomings are complex. First, it is probable that the cost of providing many services increases disproportionately in the great metropolitan centre; we have in mind the enormously expensive works required to provide the huge modern city with main drainage and sewage disposal, highways capable of carrying the continually growing mass of motor vehicles, water supplies which may have to be brought a distance of a hundred miles or so, housing and slum clearance, and so forth. Secondly, as the transport and traffic facilities improve, the number of workers coming into the city from outside each day increases, and these daily migrants must be provided with expensive services to the cost of which they contribute little or nothing. Thirdly, the huge rise in the value of land increases enormously the cost of providing municipal works or services for which land is required, such as housing, highways, parks and open spaces, schools and playgrounds." (302)

Baumol diagnosed a fourth reason. He asserted that economic activities can be grouped into either of two types: activities

subject to economies of scale and in which technological innovations bring important cost savings, and other activities which do not allow for constant and cumulative increases in productivity through capital accumulation, innovation, or economies of large-scale operation. It is easier to understand the present financial crisis of cities if it is recognised how large a proportion of the services provided by the city are activities falling into the latter category; examples are policing, social services and many amenities.

Baumol offered the bleak prospect that, while on the one hand the activities of the municipal organisation will have to be expanded if standards of city life are to be maintained, on the other hand "over all this hangs the shadow cast by our model of unbalanced growth which has shown that the costs of even a constant level of activity on the part of a municipal government can be expected to grow constantly higher". (303)

In all fairness, a fifth reason for real cost increases is often the improvement in the quality of the service. Examples are quoted in Chapter 7.

Baumol's assertion, although often condemned as simplistic, is generally thought in municipal circles to contain a great deal of truth, although quality improvement or deterioration over the years makes comparison difficult.

It is for reasons such as the five quoted above that central and provincial governments contribute towards the cost of municipal services even in the largest and wealthiest cities. If, however, grants-in-aid become too large in relation to sources of taxation within the control of the local authorities then independence and responsibility of the local authorities are endangered.

A sixth reason why central and provincial governments subsidise municipal services in the largest cities lies in their recognition that it is these centres that contribute so much to national growth and development, and from which the higher tiers of government derive so much of their revenue. For example, the four major urban industrial concentrations (PWV, Greater Cape Town, Greater Port

Elizabeth and Greater Durban) "account for nearly 85 per cent of the gross output of manufacturing industry." (304)

Section 8.3.2.2 further discusses finance in general terms.

3.1.4 COMPELLING REASONS FOR METROPOLITAN CO-OPERATION

There is an increasing tendency, in most metropolitan areas of the world, towards inter-authority co-operation. There are compelling reasons for this, among the most important of which are:

- i) the nature of certain services, which require action over an area wider than that under the jurisdiction of any single municipal authority;
- ii) the need to correct inequities in the distribution of services and resources;
- iii) economic advantages arising from large-scale operation; and
- iv) the need to control growth at the outskirts of large urban areas.

These reasons may be elaborated as follows. (The same paragraph numbers refer.) They all receive further detailed attention in this thesis, and many examples are given.

- i) Experience in many countries demonstrates that many urban problems do not fit within the existing jurisdictional boundaries. The control of air and water pollution, for example, requires metropolitan-wide action. Bulk waterworks systems need metropolitan-wide organisation, especially where the source of water, the distribution network, and the users of the services are located in different jurisdictions. Effective transport systems also demand areal planning, because dwellers in urban areas increasingly tend to live in one place, work in another and pursue recreational activities in a third.

The interrelationship between the various services frequently requires an area-wide approach. Housing, transport, water supply and wastewater treatment are invariably linked to one another in an urban context, and they tend also to be related to other service functions. A comprehensive understanding of the systems nature of urban services is needed.

- ii) The greatest demand for certain services in urban areas may be where the inhabitants are least able to afford them. This applies particularly to welfare services, housing, amenities and roads. The problem is particularly aggravated when the system of financing requires that each should mainly be financed by its users. Areas with a small tax base may thus be unable to afford even the minimum standards required.

However, that many large urban communities find it advantageous to ensure a minimum standard of services in the poorer areas is often because of a pragmatic standpoint, and not just for justice and welfare reasons. The effect of lack of services in one community is rarely confined to that community alone. For example, when the residents of a slum or squatter community turn to crime, other parts of the city are immediately affected. Epidemics originating from unsanitary areas may sweep through the whole metropolitan area.

- iii) The cost per unit of output of a service varies with the type of service, the area involved, the size and per capita wealth of the population served, and other factors.

A number of statistical studies have shown an inverse relationship between the size of city and the average per capita expenditure on certain services. Studies which take the quality of urban services into consideration have also shown evidence of economies of scale on certain services within certain limits.

This thesis gives cost function theory extensive coverage, initially in Section 4.2. It is a production line concept, and more needs to be known about its applicability to local authority services.

- iv) One of the most serious problems of rapidly growing cities is uncontrolled peripheral development. The extension of urban services to points far from the centre places a strain on the finances of the city.

In many instances it has become necessary to extend planning

and jurisdictional boundaries beyond the built-up area in order to achieve a comprehensive approach to urban development. Besides achieving greater efficiency, this approach confers benefits of social and political significance, such as the integration between urban and rural areas and the development of a sense of community over the region as a whole. The organisation into one administrative unit of a region centred on a city of course does not overcome all difficulties. For one thing, there is often considerable competition for financial resources between the conflicting demands of urban renewal in the core city and the extension of infrastructure and other services to the peripheral areas. Nevertheless, it is invariably the case that the establishment of a formal co-operative organisation makes it easier to deal rationally with economic and financial problems.

Pressure for organisational change as a result of the factors described above has been characteristic, in varying degrees for each area, of many metropolitan areas in many countries.

The purpose of this thesis is to draw up a methodology of investigation, for use in generalised circumstances, of the existence and scope of the pressure for organisational change, and of appropriate action in the face of this pressure.

3.2 APPROACHES

It is noted above that fragmentation of responsibility is invariably one of the most serious problems hampering the provision of services in a metropolitan area. Fragmentation contributes to problems of duplication of effort and obscures areas of responsibility, creating rivalries and conflicts both between and within various services. Waste of effort and resources may result from the lack of a wider developmental framework and from the overlapping of autonomously run services.

Sound urban administration depends to a large degree on a proper appreciation of the interdependence between services. In too many

instances, co-ordination of administrative effort is attempted by the imposition of hierarchical controls or by the complete amalgamation of units into larger bodies. But a true understanding of the interrelationship between services enables a focus of attention on crucial points of interdependence between programmes and hence on secure bases for co-ordination. Links may be made on the basis of interdependence of functions, or procedures, or resources or the clientèle to be served. Chapter 5 of this thesis highlights the presence of a system.

Problems of co-ordination are likely to vary a great deal, according to the historical traditions and the political realities of the region. As a rule, co-ordination problems arise when there is too doctrinaire an adherence to principles of local autonomy, or where rivalries develop between local authorities. One mitigating factor helps to make co-ordination possible. This is the way in which, as rapid urbanisation ensues, and primarily because of the need to solve common urban problems, the necessity for metropolitan organisation becomes acutely felt by the local authorities.

Conversely, there are many services the control of which at the metropolitan tier would be inappropriate. Decisions on local parks and local roads, for example, are more suited for the strictly local authorities, provided they are made within a planning framework and a flexible (within limits) set of standards, both determined on a metropolitan basis.

There are strong arguments in favour of retaining with the electorate of the metropolitan area the ultimate responsibility for the provision of all the services traditionally associated with local authorities. These arguments oppose creating ad hoc single-purpose authorities, or allocating responsibility to the provincial tier, or resorting to any other alternative. Some of these arguments are based on the right and duty of as many citizens as possible to take an active, even if remote, part in making policy about the provision of their own services, and on the singular opportunity that local government provides for them to do so.

It would seem that metropolitan areas have to find formulae for change that are geared to two distinct, though interrelated, tiers; an area-wide (common) tier and a local (community) tier. A form (or alternative forms) must be found that is capable, administratively, fiscally and politically, of responding not only to problems of area-wide concern, but also to those of the component communities. All local authority services throughout each area should be analysed in order to decide whether they should be performed at a metropolitan tier, or at a community tier, or concurrently by both.

This topic is dealt with in greater depth in succeeding chapters. A very few principal discussion points, each of which is elaborated upon extensively in succeeding chapters, are for convenience simplistically set out below.

- i) Recalling the original three criteria of effectiveness/efficiency, finance and community participation, it is immediately apparent that it is almost impossible for any chosen organisational form to simultaneously satisfy all three criteria optimally. It may for example be that democratic control requires a structure which is inconsistent with efficiency.

An order of priority among the criteria must be established for the case of each specific service in each specific circumstance.

This conflict is dealt with in greater detail in Sections 1.2, 8.3 (especially 8.3.1) and 8.4.

- ii) The regionalisation of a wide range of services must be investigated in order to probe whether or not economies of scale exist, and with what potential. Regionalisation might be by joint action, agency arrangement, amalgamation or another method. The most suitable method must be discovered for the circumstances of each metropolitan area.

It might well be found necessary to recommend measures to promote the formation of coherent units. These measures could include the adjustment of the boundaries of jurisdictional and/or services provision authorities, or the transfer of responsibility for services from one authority to another, or the creation or abolition of authorities.

Chapters 7 and 8 take this further.

- iii) An essential part of this type of investigation is the development of formulae for the equitable allocation and distribution of costs and of fiscal resources on a metropolitan basis. Particularly, decisions in regard to the excess of revenue over expenditure in the business districts and industrial areas should be taken with care. In view of the finite revenue resources of local authorities, measures should be sought firstly to obtain increased contributions from other tiers of government, and secondly to improve local revenue-raising capacity.

It is possible in this thesis to give this matter only limited attention in view of the fact that every country has a unique set of arrangements for financing the various tiers of government. In South Africa, for example, the reform of local government finance is presently being investigated by the Croeser Committee.

The philosophy adopted in this thesis is that, within reason, the optimum organisational forms should be designed, and then financial arrangements should be made to make them work. (Section 8.3.2.)

- iv) The interrelation between existing and any proposed tiers of authority should be investigated, not only in terms of finance but in terms of functions. To illustrate: Toronto is governed by four tiers (local, metropolitan, provincial and national (federal)), but British cities by only three (district, county

and national). It may be asked, if there were a metropolitan tier in a South African setting, what role would/should the existing provincial tier play in the metropolitan area? (In terms of the case study area, this is debated in Section 12.2.)

- v) The strategy to effect the chosen form must be planned with care. There must be (and in respect of GCT the City Engineer's 1982 report GCT reform was the first and most important stage in this) a systematic determination of the pros and cons of the present form, the recommended form, and any alternatives. The reasoning, and the information on which it is based, must be made available for public discussion. Steps must be taken to inform the general public, and especially community leaders, of the proposals, the motivation, and the implications for themselves and for other groups. Finally, there must be provision for the receipt and analysis of comment and suggestions, and the proposed form must be flexible enough to accept improving adaptations. (Section 8.4.4.2 takes this further.)

University of Cape Town

I INTRODUCTION

1. Criteria and objectives
2. Local authority services provision forms in metropolitan areas : alternatives
3. Necessity for change, and approaches to change

II SYSTEMS AND METHODOLOGY

4. A deeper investigation of the nature of the efficiency and effectiveness criterion
5. The systems nature of services provision
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III INVESTIGATION

7. The services investigation : individual services
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9. Case studies : general remarks
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4 A DEEPER INVESTIGATION OF THE NATURE OF THE EFFICIENCY AND EFFECTIVENESS CRITERION

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4.1 CHAPTER PREFACE

4.2 COST FUNCTIONS IN THE THEORY OF PRODUCTION

- 4.2.1 Cost functions in general
- 4.2.2 Cost functions in local authorities
- 4.2.3 Natural monopoly
- 4.2.4 Mathematical and graphical expressions of the cost function
- 4.2.5 Diminishing returns
- 4.2.6 Implications for public policy
- 4.2.7 Disadvantages sometimes associated with scale
- 4.2.8 Time and uncertainty

Chapter objective

The objective of this chapter is to philosophise on the efficiency and effectiveness criterion, for the moment not considering the community participation or finance criteria.

The chapter defines what (in general terms, i.e. not specific to an area) the investigator must look for, and where it must be looked for. The concept and use of cost function characteristics are dwelt on.

4.1 CHAPTER PREFACE

An important step in the generalised methodology, the formulation of which lies at the heart of this thesis, may be described as follows. This step is the discovery of selected analogies which are anticipated to be of most help to attaining the objective of the methodology, viz the devising of a recommended organisational form for local authority services provision in the area to which the methodology is being applied.

An understanding of the literature on efficiency and effectiveness requires an appreciation of cost functions in the theory of production. Aspects of cost functions, such as economies of scale and of contiguity, and the monopoly, competition or other context, are discussed in this chapter.

In fulfilment of the objectives of this thesis, it is essential to discover evidence of this cost theory in the local authority services context.

Any discussion of the functions of local authorities has to recognise that the different tiers are each in a uniquely advantageous or disadvantageous position to be able to or not to be able to take advantage of the economies pertaining to various services. In the context of the present discussion, the question which often arises is which tier is the more appropriate for any particular service. Some activities have the characteristic of decreasing per unit costs up to quite large area or population. Others realise these optima at quite low levels of area or population, and may in fact then experience increasing unit costs as the quantitative output of the services increases.

Accordingly, Section 4.2 considers the nature of cost functions in the general sense. Chapters 7 and 8 survey appropriate overseas and South African literature and experience (ignoring the case study area for the while) in an attempt to discover and quantify cost function behaviour in the provision of particular local authority

services. At the same time, the cost rationale for the current forms of local authority in selected metropolitan and other large urban areas is surveyed.

4.2 COST FUNCTIONS IN THE THEORY OF PRODUCTION

4.2.1 COST FUNCTIONS IN GENERAL

The "economies of scale" hypothesis is discussed widely in the fields of management organisation and enterprise economics. It is a production line concept, a matter of physically aggregating work and the resources to do it into larger units, in the confidence that larger groups of people or equipment working together are more efficient than smaller units.

A literature survey reveals that it is thought that, in respect of most production activities (local authority services being no exception), there exists for each activity and for each facet thereof an optimum level of production. At this optimum level the per unit costs of production are a minimum. As the volume of production increases, the effect of fixed costs in the establishment of the service, which fixed costs are now divided amongst a greater number of units of output, becomes less and less, and the variable costs make up a greater proportion of the unit cost of the provision of the service. It is thought that many activities are subject to a continuous series of these economies of scale. At several stages as production increases, advantages are gained in a stepwise fashion of the spreading of certain incremental fixed costs over the larger production size.

The term economies of scale thus means that as an operation increases in size, the long-run average cost of producing one unit of output of service decreases. If such a property were to obtain under all sets of variables and constraints for any given product or service, only one organisation should, if production cost is the sole criterion and if the effectiveness of the product is no different under any set, provide all of that product or service.

However, it is necessary to investigate for each service the nature of this cost in order to determine firstly whether the average cost really does decrease as the number of units produced goes up and, secondly, whether diseconomies creep in which may cancel the economies. It is necessary to look very closely at the production process itself in order to understand the sources and impact of economies or diseconomies of scale. Stating it formally, the point of the inspection is to develop a cost function that describes how the cost changes with changes in the input factors of production.

Even when economies of scale do exist thanks to increasing efficiency with size of production, the increases may "top out" at very low levels of production.

Furthermore, pricing to the consumer does not necessarily follow cost, particularly if the producer has captured so large a fraction of the market that he does not set his prices in line with his costs.

It must be emphasised that economies of scale are neither unidirectional nor absolute phenomena. Virtually every production organisation, whether public or private enterprise, is characterised by both scale economies and scale diseconomies in its operations. Any net scale economies must be weighed together with the implications of specialisation economies and economies of technological change, as assessed in the light of the present and anticipated future characteristics of consumer demands.

As a small organisation grows, it benefits from the specialisation of functions and divisions of labour. As it grows larger, new problems may arise. Among these is internal communication, which often becomes more attenuated and distorted due to an increase in the number of staff and establishments. Another is the reduction of individual motivation due to feelings of powerlessness and loss of identification with the producing organisation. Another is the increasing difficulty of co-ordination among the increasingly more specialised functions and occupations.

Some pertinent aspects are now considered in more detail.

4.2.2 COST FUNCTIONS IN LOCAL AUTHORITIES

Scale economies are found in the provision of many local authority services. These economies occur in initial investment cost and in operating cost. Significant economies are not usually observed in raw material cost. Scale economies can also result from learning curve effects, spreading of set-up costs, and saving on back-up machinery and inventories.

That these economies are not always exploited is explained both by historical circumstances and by other elements which make up the balance of the total cost function. Average transport cost rises with the output of a single plant, since average distance to market rises, *ceteris paribus*. Furthermore, to borrow private enterprise terminology, "product differentiation" may place an ultimate demand constraint on expansion, with market diseconomies appearing as that constraint is approached.

Public policy decisions are based, at least in part, upon explicit or implicit presumptions about the cost function behaviour of particular services.

4.2.3 NATURAL MONOPOLY

The makers of public policy must distinguish between conditions of natural monopoly where there is an economic basis for discouraging competition, and conditions where there are economic grounds for encouraging the entry of new producers.

The services discussed in this thesis and defined in Section 7.1.2 as "local authority services" are all those in which, although business principles might apply to a certain extent, the special public interest in the provision of these services must be borne in mind. Where any of these services is monopolised, whether by public or private producers, the economic power of the producer must be limited so that he will deal reasonably with those who are dependent upon him. This pertains to any circumstances in which competition

is ineffective in protecting the interest of consumers and the public.

"Natural" monopoly exists when the technological alternatives are such that competition cannot work effectively. The circumstances inevitably lead to monopoly because large-scale monopoly supply is more efficient and more advantageous to the consumer.

This is very often assisted by the economies of contiguity whereby it is not primarily the absolute size of the service which gives rise to the economies, but the avoidance of duplicated effort in a particular geographic area. To illustrate, it would plainly be uneconomic to have two domestic solid wastes collection services in competition in an area, with the vehicles of each traversing every road and passing by the gates of properties served by its competitor.

Many services which are in most countries traditionally provided by local authorities have these characteristics conducive to natural monopoly. (See Sections 4.2.6 and 8.4.1.4.)

In respect of several naturally monopolistic services, local authorities have found it for one reason or another most convenient to allow private enterprise to perform the services. These private enterprise producers have then been regarded almost as if they were chosen entities to whom the public interest has been entrusted. Intervention in these instances has been directed to controlling the conditions of each service and to regulating the profit levels of those performing the service. Freedom of entry of competing bodies has been restricted.

4.2.4 MATHEMATICAL AND GRAPHICAL EXPRESSIONS OF THE COST FUNCTION

The principle of economies of scale can, where the pure form of the characteristic is present, be shown mathematically as follows:

$$C = KV^S$$

where C = cost of the works or producer

K = a constant

V = total volume or capacity or some other quantity
measure of the works or producer

S = scale factor (i.e. mathematical economies of scale
power).

Where economies of scale apply, the value of the scale factor can be derived empirically. At the extreme values of the scale factor, $S = 1,0$, economies of scale have disappeared, and the cost is increasing linearly with the volume of output. With a value of $S = 0$, the cost of producing additional units is 0, and the original fixed costs are spread over more and more units of production. If the value of S is greater than 1,0, then the production is subject to decreasing economies of scale. In other words the addition of extra units causes the average cost of all units to rise.

The principle of economies of scale can apply both (together or separately) to the capital investment portion of an activity and to the operating cost of the activity.

The production function assumes that the producers are able to achieve optimal conditions of operational efficiency at all volumes of output. The economic problem to be addressed is one of allocational efficiency, i.e. the allocation of resources among works or producers and, thereby, the volumes of output to be produced by each.

The models of the theory of production focus upon two different planning horizons for decision analysis, the short-run and the long-run. The short-run is defined rather nebulously as a period in which some input resources are not subject to the control of the producer and thus costs are fixed, while other resources and their costs may be varied with production levels.

When it is necessary to increase the output of the service being

considered, increased input is required. If all inputs increase in the same proportion as the output (an increase in the scale of production) then the cost equation is of linear form, i.e. there are constant returns to scale. However it could be found, depending on the circumstances, that the increased output is possible with an increase of input to a lesser proportion (in which case declining unit costs or economies of scale are experienced), or that it is necessary to increase input in a greater proportion (increasing unit costs, or diseconomies of scale). A single production function may exhibit all three types of returns at different times. Much of the economic literature on production assumes that long-run production functions are characterised by an initial phase of economies of scale for small quantities of output, then a phase of constant return to scale and finally a phase of diseconomies of scale as the quantities of required inputs become greater. The critical decision as far as the research, part of the methodology of investigation the formulation of which is the objective of this thesis, is concerned, is to discover over which ranges the economies of scale for each of the relevant services operate. Is the service under consideration at any moment subject to increasing, constant or decreasing returns to scale over the range of production demands which it may experience?

The context of short-run economic analysis is not appropriate to a discussion of economies of scale and claims of natural monopoly in the provision of the services of interest to this thesis. Declining cost functions that result from such factors as the allocation of fixed costs over a larger quantity of output are of limited value. If these declining cost functions were reflective of economies of scale, every producer who was not operating at full short-term capacity would be a natural monopoly, since all producers must endure short-run fixed and overhead costs. Short-run cost characteristics provide no basis for either market monopolisation or the limitation of entry.

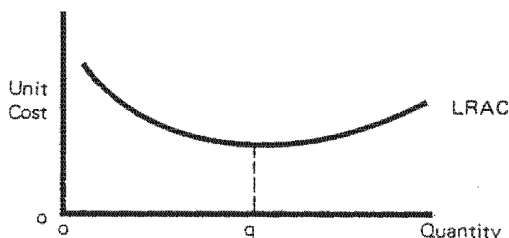
In the long-run planning horizon the range of output variation is much greater than it is in the short run because the producer may

increase or decrease the scale of his plant. The fixed resources, and therefore the fixed costs, become variable in the long-range planning decision. They can be allocated to alternative uses. In the long run there is sufficient time for new producers to enter or for existing producers to exit the market. All resource inputs can be varied together. Only the production process itself, i.e. inter alia the state of technology, remains fixed in long-run static analysis as the term is applied in this thesis.

A long-run cost function is illustrated in Figure 4.2.4A. When the long-run average cost (LRAC) curve is declining, economies can be achieved by increasing the scale of operation. When the LRAC curve is increasing, diseconomies will arise if the scale is increased. In theory, the producer should produce at quantity q . In practice of course in respect of local authority services the decision is invariably required the other way round, i.e. the producer is faced with predictions of quantity demanded, and he must therefore engage plant and other resources which are capable of supplying the quantity demanded.

It is important to consider the relation between the economies of scale and the size of the "market" (to use conventional economic terminology, but the concept is equally applicable to the provision of public enterprise services). If economies of scale, no matter how great in absolute terms, can be fully exploited at an output level for the producer that is, say, ten per cent of the total

FIGURE 4.2.4A
COST FUNCTION IN THE THEORY OF PRODUCTION



market, then clearly ten equal size producers could in theory between them supply the total market. In some circumstances the organisational efficiency of this would be greater than if one producer of ten times the individual size was responsible for supply.

What is important for policy consideration is the net balance of these economies and diseconomies and their magnitude in the light of other concerns of public policy, and also the many other factors, mentioned above, relevant to the total cost function of the service produced.

Finally, the direction and rate of technological change is a matter of great importance for public policy, because it is the state of technological alternatives available at any point in time that dictates cost functions. Economies of scale and natural monopolies can be created or destroyed by technological change.

4.2.5 DIMINISHING RETURNS

The above mathematical relationship of economy of scale is in many instances in practice modified by the competing principle of diminishing returns to scale. For many real situations the greatest benefits per unit of resource committed to a given job are derived from the first few rand equivalents invested in the venture. Succeeding investments return less and less until the benefits to be gained from an additional marginal investment just counterbalance the cost, and the sensible motivation for further investment ceases.

For example, if a precipitator for removing particles from a chimney gas is designed for ninety per cent removal efficiency and removes 90 kg of pollutant per hour, then a second unit in series with the first, and fully as large and costly as the first, may remove only nine additional kgs of pollutant per hour.

In order to place any discussion of economies of scale into perspective it is necessary to draw attention to its interaction with the principle of diminishing returns. Increasing the size of a process plant in order to accommodate more raw material (for example wastewater) would, provided that the range being considered is that which is susceptible to economies of scale, result in the cost per

volume unit of raw material capacity reducing. However, if the purpose of the increase in the size of the plant is to produce a more highly treated or refined material, it will probably, by reason of diminishing returns to scale, be found that the cost per volume unit of output will increase. If the objective of increasing the size of the plant is to increase both the output and the degree of treatment, then the question of whether the unit cost increases or not will depend on which of these inter-acting principles is dominant under the particular conditions of the example.

This principle does not only apply to the situation where tangible units are produced. Many examples may be found for example in health care, where doubling the public health effort is not expected to result in a doubly healthy population.

4.2.6 IMPLICATIONS FOR PUBLIC POLICY

It is apparent from the foregoing that public policy must be fashioned by consideration of the many factors that determine both the total cost function and the interests of the public.

Under circumstances where there are continuously improving economies of scale throughout the entire range of total output for a service, conditions of static natural monopoly will prevail. In the context of this thesis, this is constrained within specific geographic areas and by other factors. Not only is it more efficient in terms of technical economic efficiency if a single supplier serves the entire market, but it is impossible to maintain competition as a viable and effective force. This is because the competitive pressures for efficiency will force one producer to this level of maximum efficiency, thereby driving the relatively less efficient competitors from the market.

The clear implication for public policy is that it would be futile to attempt to maintain competition under these circumstances. However, since an unregulated monopolist has the economic power to exploit consumers and to engage in uneconomic and inequitable price discriminations, public policy must be directed to ensuring that the benefits of economies of scale are passed on to consumers and are not simply absorbed as excessive monopoly profit. The question of

what is "excessive" is a contentious and involved subject that is not dealt with in this thesis.

In theory, if economies of scale do exist, public policy need not erect any legal or policy barriers against the entry of new competitors. A rudimentary evaluation of the technological alternatives should make it clear to all potential entrants that they cannot achieve the economies of scale necessary to compete on an efficient and profitable basis. Economic theory indicates that the best test for resolving the economies of scale issue is the market test. However there are in practice two flaws with this theory.

The first of these can be described as follows. As a laboratory for testing scale effects, the market does not find it possible to separate the economically efficient economies of scale from the economically inefficient monopoly power effects. If the market is being developed anew by many producers, none of which has significant monopoly power in the initial instance, one might place strong credence in the results of the market test. However, if the market test is applied after the monopoly has been established, one cannot place credence in the results unless a strict programme of antitrust and regulatory policies is enforced that will neutralise the power of the established monopoly. The ability to destroy competition by means of monopolistic anticompetitive practices is definitely not an economy of scale.

The second factor runs directly contrary to the first. In many practical instances the monopoly is not pure but is exercised in a beneficent manner. For example, the decision may be made to assist certain socio-economic groups which are less able to afford the service. Then the monopolist, whether private or public enterprise, is expected to charge these consumers at prices less than cost, and presumably to make this up by charging other consumers at tariffs more than cost. Many instances of this were quoted in GCT reform.
(401)

If socially beneficent functions are being performed by the monopolist then prices will deviate from actual costs, and, if this social policy is to be preserved, pure competition cannot be

permitted. Hence the established monopolist will, often with great social justification, protest against the attempt by a competitor to serve the most lucrative section of the market only, and to leave the less profitable sections severely alone. American literature refers to this action as "cream skimming."

Another reason why prices deviate from actual costs may be that this is more convenient for the producer. Many products are sold according to stepwise tariffs even though the costs follow not a stepwise but a continuous cost function. This is done because the administrative costs of implementing a tariff with small increments between the charge to one set of consumers and that to the next set, are more trouble than they are worth.

It is not possible to take this discussion any further in respect of general cases. Further argument must be postponed to the consideration of particular services in particular circumstances. However this statement of the context is an essential preliminary to these particular considerations.

4.2.7 DISADVANTAGES SOMETIMES ASSOCIATED WITH SCALE

There are several disadvantages which are sometimes associated with the pursuit of economies of scale by a producer. Partly these derive from the sheer size of the producer, and partly they derive from the monopoly characteristic of a single producer (if there is indeed a single producer).

While a natural monopoly, which a local authority is implicitly assumed to be, is in theory able to supply a market at lower average cost than two or more producers are able to, incentives for efficient and responsive performance may be lacking.

A generally prevalent and often significant cause of internal diseconomies of scale is the limited ability of management to control and co-ordinate a large production organisation. Beyond a certain size of organisation, the contact of the top-level management with the day-to-day operations of the organisation becomes more remote. Additional layers of middle managers must be created, and the efficiency per unit of expenditure on management is reduced in what is becoming a bureaucracy.

Furthermore, the uniformity so necessary for internal control, manifested in such characteristics as large-scale standardisation, in respect of many operations, may prevent the large producer from realising the economies of specialisation that can be exploited only by the producer involved at a smaller scale of production for a limited sector of the market.

Thus the very principles that appear to make economies of scale possible may carry with them countervailing diseconomies. These disadvantages can under certain circumstances be avoided, for example by the large producer subcontracting out certain items of the production process in order to enable the economies of specialisation to be achieved through the use of these smaller subcontractors.

Another accusation levelled against large producers, often with justification, is that their enormous financing requirements and sheer size may make them slower to perceive and respond to specialised requirements and to initiate market and technical innovations. Although the technical and financial resources are available, the necessary flexibility of response is not present in the larger organisation.

Reference is made earlier to product differentiation. A group of consumers may have a great variety of individual demand characteristics. For a large producer to supply each consumer perfectly could require him to charge prices that the consumers would be unwilling to pay. In practice, consumers will purchase units of production that come reasonably close to approximating their needs. The larger producer has, in order to achieve economies, to exploit standardisation of production and the supply of units which are homogeneous in as many characteristics as will enable him to maintain the necessary economies of scale. A smaller producer might be in a position to satisfy more closely the demands of a section of the market, albeit very likely at a higher price than the standardised unit produced by the larger producer. Not only would the production cost of the more differentiated production units rise, but the cost of discovering those preferences is higher than the cost of assuming standard preferences throughout the community. Exploiting economies of specialisation and avoiding

bureaucratic inefficiency may however counteract these higher costs.

Again, the extent to which each of these factors operates depends on the product and the circumstances being considered. Whereas in respect of many services the consumer is apparently satisfied with standardised units of output, in respect of other services demands are becoming more and more diversified and heterogeneous. An example of the former is wastewater treatment, and an example of the latter is sidewalk paving and/or planting. (This theme is further developed in Section 8.3.3.3.)

Certain economies of scale apparent in the past are being reduced in impact by changes in demand characteristics. In the context of local authority services this is possibly the most telling argument in favour of the continued existence of small production units, i.e. small local authorities or portions of local authorities which can offer a higher or lower standard of service, or in some other respects differentiated service, compared to the norm. The performance of practically any service of the type considered in this thesis is never exactly standard throughout a metropolitan area (because the physical location of the consumer, to name one factor, is inevitably different to that of any other consumer in the metropolitan area). However the consumer should ideally always have the option of being able to move to another area where the standard of services is in some way different and perhaps more to his liking. This is of course subject firstly to the ability of the consumer to afford the different cost associated with the different standard of service and secondly to the continued observance by the producer of the service of certain limits, transgression of which would cause other consumers to be prejudiced. By the latter is meant that, to use solid wastes treatment as an illustration, the consumer is not permitted the option of cutting down on services to the extent that the well-being of other consumers is prejudiced.

4.2.8 TIME AND UNCERTAINTY

The characteristics of the producer's investments, including the amount of the expenditure, the type of facilities added, and the timing of the additional investments, depend directly upon the quantity and structure of the productive capacity inherited from the

past as well as on the plans for related investments in the future. The producer is in a continuous process of partial adaptation to changing events and is almost never in the position of complete adaptation which is assumed by the theoretical cost function concept. The producer must make his investment decisions on the basis of the capital inherited from the past. His planning for the future is severely limited by his inability to forecast future events accurately and to perceive all of the effects of his alternative investment possibilities.

When time and uncertainty are introduced into cost function analysis, several additional important factors become clear. Firstly, there is no necessary relationship between the inherited size of the producer's organisation and his ability to pursue fully all opportunities for economies of scale at the time which is being considered. The large producer may inherit a large market, but he also inherits a large commitment to past investments in existing production facilities.

Secondly, the cost function characteristics have much to do with the frequency of investments in productive capacity. If economies of scale are significant, additions to productive capacity to serve a growing market cannot be made on a continuous basis. Rather, the economies of scale will make it economical to add larger capacity units at less frequent intervals. This "lumpy" investment schedule will destroy the continuity of the scale relationship and might thus create countervailing diseconomies. At any given time, a portion of productive capacity will be underutilised. If several identical units of plant are being installed at the same time, this is usually evidence that some of the economies of scale can be exploited at relatively low levels of output. However, the economies of scale associated with all units of plant, e.g. the producer's overheads which are spread over all units of plant, are probably not affected by this argument and can still be exploited by the addition of extra units of plant.

Thirdly, there is often a correlation between economies of scale and the economic life of producing facilities. Generally, the planned economies of scale cannot be realised unless the long lives assumed in the scale calculations are realised. This of course raises

additional elements of risk and uncertainty that must be recognised in the analysis of economies of scale. The uncertainty of changing input and output market conditions and of changing technology are direct threats to the realisation of scale economies. On the other hand, small scale production generally permits a lower level of uncertainty to be assumed, and a greater degree of flexibility is provided.

It may be asked why the effects of time and uncertainty are not rigorously dealt with in this thesis by means of techniques such as complex cost-benefit analysis. These techniques could ideally also permit the incorporation in decision-making of allowances for non-quantitative factors or factors which are not readily weighed in efficiency and effectiveness analyses by any other means.

The reasons why these techniques are not used are fourfold. Firstly there is their complexity. Secondly, their uncertainty in their comparison between variables measured in different units and between these variables and those which are unquantifiable is daunting. Thirdly, there is the realisation that the exclusion of many variables is, for the purposes of the thesis methodology, not likely to lead to any change in the recommendations. Fourthly, use of the criterion of efficiency and effectiveness is a cost-benefit analysis, albeit of lesser complexity.

Thus, as explained in more depth in Section 8.3.1, these techniques are not used.

5 THE SYSTEMS NATURE OF SERVICES PROVISION

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5.1 PRESENCE OF A SYSTEM

5.2 FACTORS IN MAKING A DECISION

Chapter objective

The objective of this chapter is to highlight the presence of a system, i.e. that efficiency and effectiveness of the provision of individual services (engineering or otherwise) cannot be divorced from similar considerations of other services nor from finance and community participation.

5.1 PRESENCE OF A SYSTEM

A metropolitan area usually consists of a major or core city surrounded by a number of smaller local authorities. Multiple jurisdiction is thus a basic feature of the metropolitan area.

Another basic feature of any metropolitan complex is that it forms an area of intense movement of commuters, of goods and services. The metropolitan complex thus forms the functioning unit. Its foundations are functional, viz. spatial, circulatory and economic.

The metropolitan area can be looked upon as an open system with a diverse array of subsystems. Intervention in one part of the system usually has ripple effects in other parts of the system. The subsystems (e.g. transport, pollution control, housing, employment) are usually the responsibility of many jurisdictions. These jurisdictions may be divided on vertical (central, provincial, local) or horizontal (same tier) lines, or both. Thus a picture exists of fragmented authority. The development of the metropolitan area is affected by the activities of many decision-making bodies, private and public enterprise, elected and appointed, general purpose and special purpose. This underlines the need for co-ordination and co-operation, and rationalisation of existing services provision forms.

Two additional characteristics of a metropolitan area can be cited by way of example. These characteristics are not unique to metropolitan areas; they are present in smaller urban areas too, but their significance increases at a rate greatly in excess of the rate of urban size increase.

The first characteristic is interdependence. The metropolitan area is typically an area within which mutual interdependency predominates. The area has a common focus and imprecise outer boundaries. It is an area where local authorities are so close to each other and development of such nature and tempo that these local authority areas and the land in between cannot be seen as isolated

entities, but must be seen as influencing each other. Because of these interrelationships, a unitary approach to land use and control of many activities is a necessity.

Secondly, the scale or degree of internal differentiation often represents a qualitative difference between the metropolitan and the non-metropolitan urban area. Changes in scale often bring about changes in complexity and character. For example, the intensity and variety of choices are, because of scale or size, much greater in metropolitan areas. Typical is the complexity of the metropolitan economy where the variety of opportunities, occupational differentiation and the combination of a multitude of skills and markets in a confined geographical area, at a scale sufficiently large, form the generating power for growth. Scale is also reflected in such diverse factors as longer commuting distance between place of work and residence, and the greater availability of leadership and expertise.

Thus the systems nature of the provision of local authority services (in any urban area, but particularly in a metropolitan area) may be viewed in three phases.

Considering for the moment the efficiency and effectiveness criterion only, the standard at which one service is actually provided in a particular area may affect the standard required of that service in a nearby area, or of another service in that or a nearby area.

Secondly, still considering the efficiency and effectiveness criterion only, the grouping within one authority of responsibility for the performance of several services in a single area leads inevitably to a compromise of the cost function characteristics of each separate service.

Thirdly, in the formulation of any organisation for services provision, the efficiency and effectiveness criterion cannot ultimately be divorced from the criteria of finance and community participation.

In the remainder of Chapter 5, services, whether engineering services or other local authority services, are discussed in general terms. Chapters 7 and 8 of this thesis summarise a detailed investigation into pertinent services characteristics, in particular into the presence and nature, for each service and for groups of service, of cost functions in the theory of production. Essential differences between individual services are pointed to.

However one important finding may readily be anticipated, viz that links exist between services, i.e. that the operation of each has externalities which affect other services. (Some examples of this are given in Section 3.1.4 above, and more follow in Chapters 7 and 8 and in the case study description.) The term externalities may be taken, depending on the context, to refer to either -

- the relationship which one service has on another service in the same area, as for example the effect on transport planning of land use planning decisions or the provision of infrastructure, or
- the effect that the performance (or non-performance) of a service in one area has on that or other services in a nearby area, as for example the effect the neglect of air pollution control measures in one jurisdictional area has on the health of the population in another area downwind of the first.

The argument against any services provision form other than the multipurpose authority is already noted (Sections 2.2.3 (iv) and 3.2). Hence it is clear that, in establishing the optimal organisational form for any area, a compromise will have to be achieved between the individual cost function and other characteristics of each of the many services which the multipurpose authority is expected to provide.

5.2 FACTORS IN MAKING A DECISION

The systems nature of services provision therefore critically affects the decision on an appropriate location of responsibility for any local authority service in a particular metropolitan area.

This decision depends upon a judicious assessment, in respect of each service, of the advantages of size as opposed to the advantages of decentralisation, of its links with other services, and of the identification of those services -

- which are sufficiently standardised and/or sufficiently free of local possessiveness to justify centralised production if economies of scale so warrant, as opposed to those
- which are not sufficiently standardised, not free of local possessiveness and not susceptible to economies of scale.

This topic is elaborated further, inter alia in Section 8.4.1.4.

Selecting the best organisational structure and allocation of the appropriate level of responsibility follows a clear definition of the mechanism for determining need, of the needs themselves, of the work to be done and of the resources required to do it. Form must follow function. (501)

While total financial resources for the performance of the services under discussion are limited, the distribution of these resources between tiers of authority and between jurisdictional areas should enable the performance of the set of functions which is expected of any services provision authority. (This philosophy is first expounded in Section 3.2 above.)

In making decisions as to how the services should be grouped together for performance, and which authorities should be responsible for each of them, certain partly analytical and partly value judgments are needed. These include:

- i) If larger services authorities provide "better" services than smaller ones, which level of service is actually required? Perhaps the level provided by the smaller authority is satisfactory, and does not require improvement.
- ii) If a service has a multiplicity of facets and each of the facets shows a different cost function characteristic, should the allocation of responsibility for that service rest on the

characteristics of a minority of facets? Or should responsibility for the facets be split to different tiers? For example, within the water service, the facets of treatment, conveyance and reticulation each have very different scale characteristics.

- iii) In a multipurpose services authority, which service rules in the general instance where each service requires a different operational size in order to perform most efficiently?
- iv) Given that the research findings are invariably specific to certain places and certain times, what use are these findings when other places and other times are being considered? Studies of this type are prisoners of the organisational structure in the context of which they were done, and the projection of evidence to new circumstances is subject to some uncertainty. Especially this question should be posed in respect of using the findings to motivate forms of organisation which will have to endure into the future when new and different demands might be made.

The decision to be made on the form of organisation for the provision of local authority services therefore depends on the decision-makers' values and the values of other institutions or persons which they choose to take into account. What are the most important factors associated with each service? Is specialisation important, and are economies of specialisation therefore significant? Is local accountability important; are the members of the community likely to be very much interested in changing the standards of the service in their local area? Is the service concerned a service the standard of performance of which and methods of performance of which are generally agreed within quite close limits, whether that agreement be by common consent of the local authorities, or imposed on them, or is the performance susceptible to disagreement on standards and methods? Finally, to what extent can it be claimed that the cost function characteristics are accurate enough for the purpose to which they are to be put,

especially if these characteristics are transplanted from other circumstances?

These and other questions involving the value interpretation of evidence are very relevant to the decisions to be made on any reform.

It would seem therefore that the selective grouping in each metropolitan area into a single multipurpose authority of the responsibility for several services with broadly similar but not identical economies of scale characteristics would not significantly prejudice the performance of the services. While the importance of cost function characteristics, especially economies of scale, cannot and must not be played down, these characteristics are not generally sensitive to small changes in scale.

To further mitigate the effect of grouping, there are available a number of methods of inter-authority co-operation. These methods include the use of agency, delegation and concurrent powers and inter-authority co-operative agreements. They can be used to enable the multipurpose authority to exploit economies of scale more closely to their theoretical optima. They can attempt to obtain the exercise of options in the selection of performance standards, and a higher standard of local interest and community participation in the performance of the services. They may avoid, in a real situation, the necessity of breaking down and restructuring, for perhaps marginal advantage, existing services authorities which do to some extent meet the three major criteria. The penalty associated with their use is however sometimes a partial return to a lack of clarity for responsibility and other disadvantages that the single multipurpose authority was created to avoid.

No decision should be made on any formulation in the abstract of a generally applicable local authority services provision form. The objective of this thesis is to devise a methodology of investigation. All discussion to this end is therefore deliberately not specific to any area; the case study is intended only to test the methodology and to illustrate the technique.

6 THE GENERALISED METHODOLOGY OF INVESTIGATION

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Chapter objective

The objective of this chapter is to set out the characteristics of the methodology of investigation.

The primary objective of this thesis is stated as follows: "to devise a methodology which should be used in the investigation of organisational forms for the provision of local authority services, especially engineering services, in any metropolitan area." (Section 1.3.)

Achievement of this goal is attainable through the fulfilment of a set of secondary objectives relating to, in turn -

- establishing operational criteria;
- obtaining a perception of services provision; and
- examining the methodology and illustrating its use. (Section 1.3.)

The first of these secondary objectives is already fulfilled (in Section 1.2, with subsequent discussion elsewhere).

A perception of service provision characteristics sufficient for a formulation of the desired methodology is obtained from Chapters 1 to 5, thus fulfilling the second of the secondary objectives. Subsequent chapters broaden and deepen this perception, so that by the final chapter the methodology may be confirmed.

Thus sufficient work is completed to enable the methodology to be formally stated. (The examination of the methodology, which takes place in Chapters 9 to 13, does not lead to alteration to this statement.) The methodology, which is set out below, is applicable to an assessment of services provision in a metropolitan area, whether it be an old area with established services provision organisations, or a rapidly growing area with many portions yet to receive certain services, or any other metropolitan area. This methodology is hereinafter referred to as "the thesis methodology of investigation" or simply "the thesis methodology".

The first step is an analysis of the services situation in the metropolitan area under investigation. This analysis embraces statutory background, local traditions of and mechanisms for community voice in the determination of priorities, established services provision forms, and existing standards of service

provision. It pays particular attention to imbalances between areas and between services in the satisfaction of the need for services, in financial resources, and in personnel resources.

The local information may be obtained from a literature survey and from local practitioners, such as local authority personnel, researchers, contractors and consultants, as well as from the consumers of the services in question and from their representatives.

The objectives of the second and third steps, each in its own defined geographical area, are -

- to discover and to quantify pertinent service characteristics, particularly, cost function characteristics thought to exist in the provision of local authority services; and
- to discover any general patterns in and the rationale of the design of organisations for services provision in metropolitan areas.

The second step is a research and analysis, aided by a literature survey, of pertinent service characteristics in other areas but which provide information applicable to the circumstances of the area under review. Information sought includes cost functions of selected services, and their relationship to other services, suitable groupings of services for operation under multipurpose authorities, and externalities of whatever kind applicable to the services. Primarily, attention is paid to the efficiency and effectiveness criterion, but the influence of the criteria of finance and community participation is also carefully noted.

Chapters 7 and 8 of this thesis together form a good, if abbreviated, example of this type of research and analysis.

The third step is an informed and critical amalgamation of the information obtained in the previous steps. The efficiency and effectiveness criterion applies. This step includes an assessment for relevance of the information obtained in the second step, and its blending with the local information. Tentative conclusions are drawn at the close of this step.

In the fourth step the efficiency and effectiveness criterion is weighed against the financial and community participation criteria. The optimum organisation, given the particular local circumstances, for the provision of local authority services is set out. If this optimum is not achievable in the short term, a strategy for its realisation (including a statement of necessary procedures and resources) is discussed.

A programme, giving details of time, finance and other resources, for implementation of these recommendations, maybe in stages, is laid down. Review procedures are also laid down - the optimum system must not be regarded as being immutable. There must be arrangements for adapting the system to social, economic, demographic and technological changes and to changes in demands made on local authorities.

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7 THE SERVICES INVESTIGATION : INDIVIDUAL SERVICES

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Chapter objective

The objective of this chapter is to discuss and illustrate the assembly of evidence on the topic of local authority rationalisation. Particular attention is paid to the efficiency and effectiveness criterion as applied to and found in the organisational forms for services provision in metropolitan areas. Information is gleaned from a literature survey of descriptions of metropolitan areas in selected parts of the world. The survey excludes for the moment studies specific to the area chosen for the case study (i.e. Greater Cape Town in the present instance). Emphasis, for the purposes of the thesis, rests very much on engineering services.

7.1 OVERVIEW AND DEFINITION

7.1.1 OVERVIEW OF THE CHAPTER OBJECTIVE

A most fruitful learning approach to organisational reform in any metropolitan area lies through the comparative study of services provision in other metropolitan areas. This is the approach taken in Chapter 7.

It is known that cost functions for each service (and indeed for each facet of each service) follow different characteristic curves and that these may vary from area to area. Quantification of these characteristics is sought. Other information sought relates to relationships and externalities between and within services. At the same time, the rationale for the establishment of current forms of local authorities in selected metropolitan and other large urban areas is surveyed.

Particular attention is paid to the efficiency and effectiveness criterion, but the influence of the criteria of finance and community participation is also carefully noted where relevant.

7.1.2 DEFINITION OF "LOCAL AUTHORITY SERVICES"

The importance of the local authority lies in its provision of infrastructural and associated services which are a basis for the sustained development of the local community and its economy. In making this provision, it attempts to meet public needs (not necessarily demands). This in turn implies thought and skills in establishing needs, setting priorities and allocating resources.

The main functions of the local authorities are usually the construction and maintenance of roads; traffic control; the provision of potable water; the provision of electricity; the provision of housing, especially for people in the lower income groups; town planning and building control; recreation and amenity services; health services, such as air pollution control, immunisation against infectious diseases, and inspection of food and meat; the provision and control of abattoirs and fresh produce

markets; the provision of a library service and a limited range of other cultural services; trade and other licencing; the provision of emergency services such as fire fighting and fire protection; land drainage; sewerage and wastewater treatment; solid wastes collection and disposal and/or treatment; civic government services such as secretarial services to the council body and fixed property revenue assessment and collection; and the necessary range of backup facilities thereto.

Not all of the above are everywhere entrusted to local authorities.

The listing above does not exhaust the functions of local authorities in some areas. Cape Town Municipality is involved, through satellite organisations, in the promotion of tourism and the encouragement of industrial development. Durban Municipality provides shark nets and boats to maintain them. (701) "One finds municipal universities in some cities; municipal pawnshops, savings banks, laundries, restaurants and hotels in others." (702)

Furthermore, "the list of services most commonly provided by the governments of great cities gives no indication of the scope or standard of performance. ... 'Public health' may signify very little or a great deal. A sewage [sic] system may be provided for the entire metropolis or for a few favoured districts. Recreational and cultural amenities may or may not include municipal art galleries, museums, theatres, opera houses, concert halls, libraries, a planetarium, radio stations and many other activities; while sporting and athletic facilities can cover playing courts, swimming pools, gymnasia and much else." (703)

The above paragraphs suffice as a definition of local authority services. Each time the generalised methodology of investigation is used, it is essential that clarity be obtained on which services are being researched, and on the scope of each service, before any analogies are drawn. The services which were researched in depth in the Greater Cape Town study of 1982 were set out in its Annexure 7.2.1A. (704)

Which local authority services are engineering services are similarly loosely defined as those which are in any instance the

responsibility of the local and metropolitan authority engineering departments, and of the provincial or state and central government engineering departments acting within the metropolitan area.

7.2 THE LITERATURE SURVEY : GENERAL

Information must be collected, as described above, on the factors pertinent to the relevant range of services.

Each application of the methodology must make its own selection of literature to be reviewed. GCT reform concentrated on material from the metropolitan areas of -

- Canada
- the United States
- Britain
- Australia and
- South Africa (excluding for the moment studies specific to GCT itself).

Any other application of the methodology should seek a selection of literature from the set of countries most appropriate and convenient to it.

The reasons for the GCT reform selection (although other countries were remarked upon from time to time, if they were of interest) lay in the following factors:

- i) In respect of all five, English-language literature on metropolitan areas is more readily available than it is for other countries.
- ii) In respect of four of the five (excepting only the United States), visits by the City Engineer of Cape Town and members of his staff had in recent years been made. These visits had established contacts, collected a vast amount of information, and obtained insight into the methods of operation and the advantages and problems accompanying the organisational forms for services provision which were encountered there.

- iii) The perceptions of the role of local authorities and concepts such as democracy, the financial systems, and the scope, standards and expectations of local authorities as a provider of services, were sufficiently similar in all cases to those in GCT. Particularly, referring to studies from elsewhere in South Africa, the relatively free availability of information and also, in respect of some national and regional issues, the essential background information preliminary to the Greater Cape Town explanation, was of great use.
- iv) The examples drawn from the four foreign countries provided a wide spectrum of types. The Canadian cities were governed by two tiers in the metropolitan area only, i.e. metropolitan governments/districts and local area municipalities. Britain's two-tier government, of counties and districts, applied to both metropolitan and non-metropolitan areas. The United States abounded in single-service authorities. In Australia local authorities were not in control of many of their larger services because these were given to arms of the state (i.e. provincial government equivalent, in South Africa terminology) or to semi-independent boards.

There is little doubt that any study which uses the generalised methodology advocated by this thesis will find particularly useful two well-documented processes of local authority services provision reform. The first of these is the institution, nearly thirty years ago, of two-tier government in Metropolitan Toronto, and its subjection to periodic detailed report and modification since then. The second is the process of local government change throughout England and Wales, the subject of an intensive study by a committee under the leadership of Lord Redcliffe-Maud in the late 1960s and instituted, in a somewhat modified form compared to the Maud proposals, in 1974.

The GCT study commented that much of the material received was very relevant to its needs. Cost function data and experience of particular services provision forms were carefully sifted for transferability from their original context, and many useful

analogies were drawn.

On the other hand, some of the references contained a lot of information that was not found to be useable. "Especially the Toronto studies are laden with statistics, yet little of this is directly used to support the recommendations which follow in those studies. It might not be unfair to suspect that in most cases the recommendations reflect other, unknown, considerations, and the conclusions are evidently reached in some cases despite the statistics." (705)

7.3 THE LITERATURE SURVEY : FORMAT

It would be useful if, in any application of the methodology of this thesis, a standard format were kept for the analysis of each of the services.

The GCT study used a series of seven section headings, as follows, to divide the analysis of each service:

"1, 'purpose of the service', states the purpose of the service in general terms...

... 2, 'facets of service', lists the various facets under three headings where possible -

- general (i.e. name of facet);
- 'material' dealt with (this could be the type of user or the type of facility); and
- processes.

... 3, 'comparison', dwells on the problem of comparisons between the service in one area and its performance in another. Inter alia, it lists criteria for comparison, such as cost, and discusses the general desirability within a local authority, to assist its decision-making between alternative uses of its income resources, of putting a price to the service.

Attention is drawn particularly to the (this-service)-related community characteristics and other background factors. Understanding of these is vital to an interpretation of the

relationship between inputs and outputs, and is a precondition to ensuring fair comparisons being made over time and between cities or between different areas of a city.

... 4, ['cost function'], documents any studies which have found for or against the existence of economies or diseconomies of scale or any other type of economies. Firstly, the question is asked whether there should theoretically be economies of these types. Secondly, particular note is taken of figures which state at which size of the service these economies are encountered.

... 5, 'agencies', reviews the advocacy of alternative agencies for the performance of the service. ...

... 6, 'location of responsibility', records the available evidence on and arguments for and against the allocation of responsibility for the different facets to different government agencies or, if the service is given to private enterprise, its allocation in chunks of different size. A description is given of the chosen arrangement in the countries surveyed and particularly of arguments advanced in recent years for revision or retention of the arrangement current at the time of each case study.

Particular comment is made if it is not in order for each local authority to choose the level [i.e. standard] of service it wants, i.e. if there are externalities which require co-operation on a metropolitan scale.

... 7, 'conclusion', discusses -

- if there is general agreement on the existence of economies of scale and at what level they operate;
- whether any of the evidence would be of relevance or assistance to a decision on the same service in GCT; and
- to what extent is much of the above discussion of metropolitan action of reduced interest in the face of the input on a much greater scale by provincial and/or (particularly) central government in the form of their own policies, incentives, economic pressures, plans and capital investment?" (706)

This format is used in this thesis, and it, or a similar format, could be used by any other study.

7.4 THE LITERATURE SURVEY: EXAMPLES

7.4.1 CHOICE

There is not the space in this thesis to assemble a full range of evidence on organisational forms for local authority services provision, even if only that from the five countries named in Section 7.2 above and relating only to services listed in Section 7.1.2 is included.

Hence only two services are quoted as examples. In both cases the larger part of the research reported is a revised and abbreviated version of that in the GCT study. Material subsequently received by the author is selectively added.

Because of the engineering bias of this thesis, the two examples are both engineering services. They are -

- sewerage and wastewater treatment and
- transport planning.

In the GCT study the first of these is linked with "land drainage" and the second with "public transport operation and traffic". In the interests of brevity, and without any detrimental effect to the power of the illustration, these two linkages are here broken.

7.4.2 SEWERAGE AND WASTEWATER TREATMENT

As noted above, this Section 7.4.2 is largely a revised and abbreviated version of the relevant description in the GCT study.
(707)

7.4.2.1 Purpose of the service

"The availability of water is one of the necessary conditions for urban growth and industrial development. When using water, individuals and industrial organisations produce quantities of

liquid wastes and polluted water. The collection of these waters, and their treatment and disposal, is essential if land, air and water resources are to be conserved, and individual and community health to be protected. Metropolitan areas are subject to a rapid growth in population densities and an increase in industrial and commercial activity. In addition, there is usually a trend towards a higher consumption of water by both industrial and domestic users. Consequently, the adoption of appropriate methods for the collection and treatment of sewage and liquid wastes are amongst the major problems faced by Metropolitan authorities." (708)

To the above quotation, in order to satisfactorily define the purpose of the sewerage and wastewater service, should be added the comment that wastewater is also a resource, as correct treatment will cause it to yield up for reuse many of its constituent parts.

7.4.2.2 Facets of the service

General heading	Material	Processes
Sewerage (reticulation). Wastewater treatment. Enforcement of drainage bylaws. Monitoring of industrial effluent.	Domestic wastewater. Industrial wastewater.	Wastewater treatment works and effluent to watercourses or sea. Sludges and intractable liquids. Resources recovery. Design. Departmental construction. Contract documentation and supervision. Departmental maintenance.

(The purpose of industrial effluent monitoring is -

- to protect the sewers and treatment works against discharges of harmful, toxic and dangerous chemicals; and
- to assess a charge, based on the volume and strength of the effluent, to be made against the industrialist responsible.)

7.4.2.3 Comparison

The comparison between the standard of and cost of performance of the service in one area and that in another is very much dependent

on a number of background factors, which must therefore be most closely taken into account whenever analogies are being drawn from experience in other areas. These background factors include -

- natural gradients, natural watersheds, natural watercourses, storm duration and intensity, soil characteristics including erodibility (for example, on the Cape Flats the sand causes blockages in the drainage network) and permeability, and the distance to suitable outfall points;
- the character of the inflow; the presence and strength of industrial wastes and the characteristics of the consumers especially with respect to their use of water;
- the extent to which the stormwater and wastewater networks are separate or combined;
- the age, design and construction standards of the drainage network; including factors such as the degree of infiltration of groundwaters into the sewers;
- the presence of suitable and convenient land for wastewater treatment purposes;
- the nature of the wastewater treatment process (in the old style, land extensive; with increasing pressures of urbanisation, these days increasingly land intensive), and the quality of the final effluent (at the limit, full reclamation to drinking water quality); and
- costing and financing procedures.

This is well illustrated by reference to Johannesburg data on the costs of operation of the different treatment works:

TABLE 7.4.2.3A

COSTS OF WASTEWATER TREATMENT : JOHANNESBURG (709)

Treatment works	Flow	Net cost of treatment
	megalitres per day	cents per kilolitre
Olifantsvlei	216,0	3,14
Northern	103,9	6,38
Goudkoppies	69,4	7,42
Klipspruit	62,6	4,60
Alexandra	29,5	3,34
Total	486,7	Average 5,52

These very different unit cost figures are more due to different capital charges, of works built at different times and under different financial conditions, than to any other reason. However other contributory factors include economies of scale, and the different characteristics of the drainage areas and the natures of the treatment processes. (710)

7.4.2.4 Cost function

This section seeks to find out by means of a literature survey if there are economies of scale in either the capital cost or the variable (operating) cost of the service, and what other economies might be exploited, especially any relating to more rational relative physical location of the component parts of a sewerage and wastewater treatment system.

It might be of value at this point for Section 4.2 to be reread. Particularly relevant are -

- the comments on the competing principles of the economies of scale and diminishing returns; and
- the mathematical illustration of the cost function in the theory of production.

"In a conventional waste treatment system where realistic relationships for the principles of economy of scale and diminishing returns are acting counter to each other, diminishing returns dominate, and the costs of pollutant control climb strongly as higher degrees of treatment are specified." Thus a perception must be maintained "concerning the costs which we impose upon ourselves and the magnitude of our commitment of limited human and natural resources to the control of pollution at various discharge levels." (711)

There is an extensive literature on the theoretical and empirical measurement of the behaviour with change in scale of cost functions in wastewater treatment.

"Wastewater treatment facilities are characterized by economies of scale in the costs of their construction and operation. The results of a number of studies have indicated that this is a system in which

the economist's classical increasing returns-to-scale is most operative. An examination of historical practice reveals at least an implicit recognition of the incremental savings in construction operation costs due to economies of scale as evidenced by the tendency to bear the costs of overcapacity until demand catches up." (712)

Rachford pointed out that the actual capacity expansion of a specific facility "requires a more rigorous analysis. Wastewater treatment consists of a series of in-line processes, each of which require separate component facilities, e.g. screening, pumping, flocculation, sedimentation, filtration, aeration, and perhaps storage. Economies of scale do not necessarily affect the cost characteristics of each of these components identically. Some components are not subject to scalar effects at all." (713) For example, "an analysis of two sources reporting on capital costs of gravity flow pipelines indicates that installed cost of a unit length of pipe varies approximately with the 0,75 power of pipe diameter. ... Cost data from over 750 [wastewater treatment] projects, receiving principally domestic flow, formed the statistical basis for ... the economy of scale parameters ... for various type wastewater treatment facilities." These ranged, according to the study, from 0,64 for primary treatment with separate sludge digestion, to nearly 0,80 for activated sludge plants. (714)

An early paper on the subject of economies of scale in both the operation and capital cost of wastewater treatment works was that by Townend in 1962. He found that, for British treatment works at that time, construction costs per capita fell very steeply for the range of treatment works serving from 1 000 to 5 000 people, and then less steeply to treatment works which served 200 000. The cost per capita for a treatment works serving 1 000 people was about double that of the works serving 200 000 people. For larger populations, the cost decreased more slowly, to approximately 75 per cent of the cost per capita for 200 000 people, for a treatment works which served one million. "Such costs necessarily differ considerably from one place to another by reason of the amount of pollution load per head, the type of plant used, the local conditions of ground and sub-soil water affecting construction, the amenity standards adopted

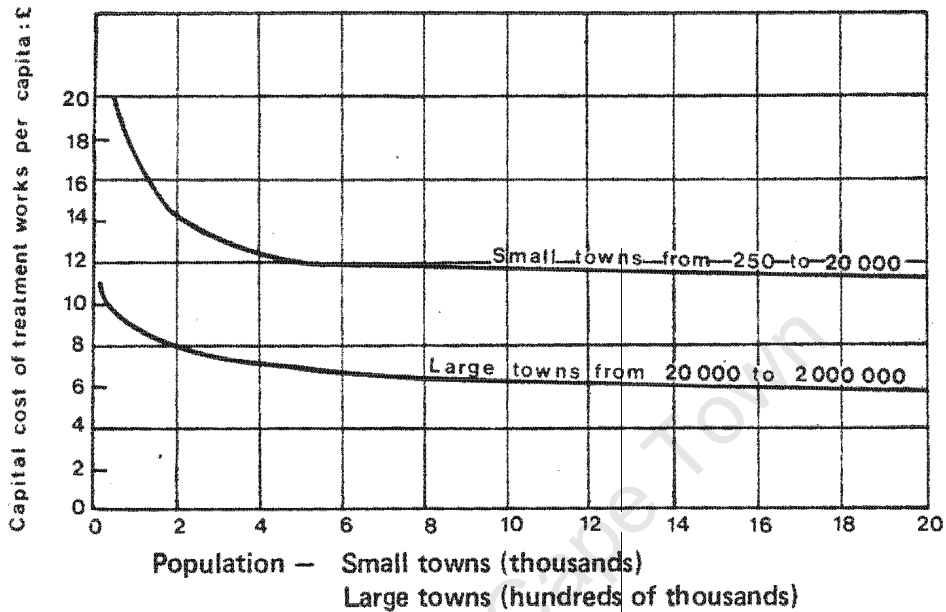
including buildings, landscaping, roads, etc, the extent to which the works is mechanized or equipped for self-generation of power, and so on. The curves are intended only to give a broad approximation of economic trends of costs with various populations." (715)

Townend commented on the expectation that in all stages of treatment larger components give lower unit costs. The size of tank units in a treatment works depends on their number; this should be reduced to the minimum consistent with flexibility of operation and adequacy of standby during periods of maintenance. "With larger works, the size of a unit eventually reaches a maximum for practical or economic reasons, and further increase in plant capacity is then obtained by increasing the number of units rather than their size. At this point no further economic advantage would seem to be gained by still larger works, but nevertheless there continues to be a small reduction of overall cost with size by reason of economy in standby plant, in buildings, roads, and in other miscellaneous ways, which continues even at populations of one or two million or more." (716)

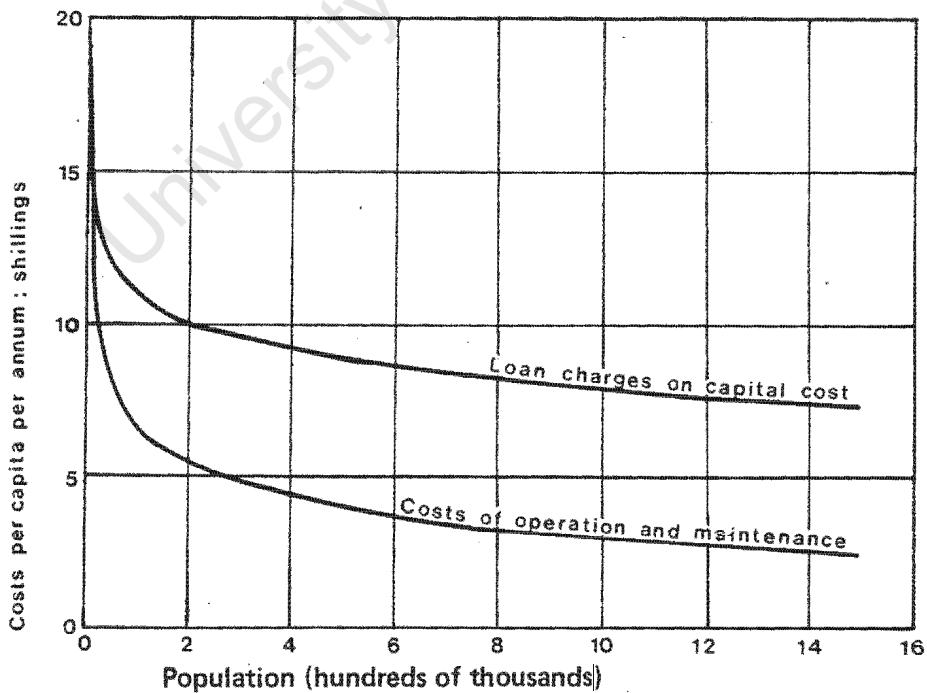
"In costs of operation, however, the economy gained from large-scale working is more pronounced and continues to improve even with the very largest populations." (717) (Figure 7.4.2.4A refers.)

A study by Berthouex and Polkowski used data from a variety of sources to produce a table of the values of the economies of scale for various types of wastewater treatment works. This deduced that the economies of scale power ranged from 0,6 for certain types up to 0,8 for other types. The valid size range was claimed in some cases to be "all"; in other cases the limitations of the range of treatment works studied dictated that an upper size range of around 5 mgd (say 25 Mld-1) be set. Optimal treatment plant expansions were calculated by minimising the expected value of long-term investment costs; this introduced other factors such as growth rates and the cost of money into the decision that a community had to make as to what capacity to build a treatment works. It was pointed out that quite a number of uncertainties operate which would quite possibly swamp any effects of uncertainty in the economy of scale factor; particularly, "trends in interest rates are even more difficult to anticipate than trends in population growth or water use." (719)

FIGURE 7.4.2.4A
 TOWNEND : ECONOMIES OF SCALE IN WASTEWATER
 TREATMENT (718)



Variation with population of capital costs per capita



Variation with population of loan charges on capital cost and of costs of operation and maintenance per capita per annum

Berthouex pointed out that treatment works often have to increase in size by using multiple units to accomplish the single function. This may be done for several reasons:

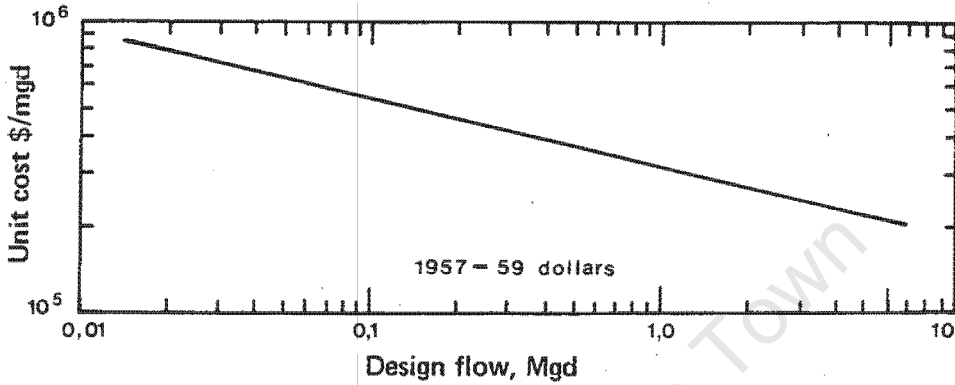
- "i) Supplying the total demand may require equipment larger than can be fabricated practically as a single unit.
- ii) The operating range of certain equipment is so narrow that variations in operating demand are best met by taking whole elements on and off stream rather than by throttling back a large unit.
- iii) Some multiple units are provided as standby to provide production capacity when another unit breaks down.
- iv) An extra unit may be provided for use when a parallel unit is out of service for cleaning or other routine service."

The data on economy of scale in wastewater treatment works disguise the fact that, often, "an economically important part of the system is paralleled or replicated at higher capacities. Different units become replicated at different points on the total capacity axis." Thus the total cost relation slackens off its downward curve as capacity increases. Berthouex showed the transition which occurs at about the size where the common practice would be to use multiple basins for primary clarification, rather than to increase basin size. (720) (Reproduced as Figure 7.4.2.4B.)

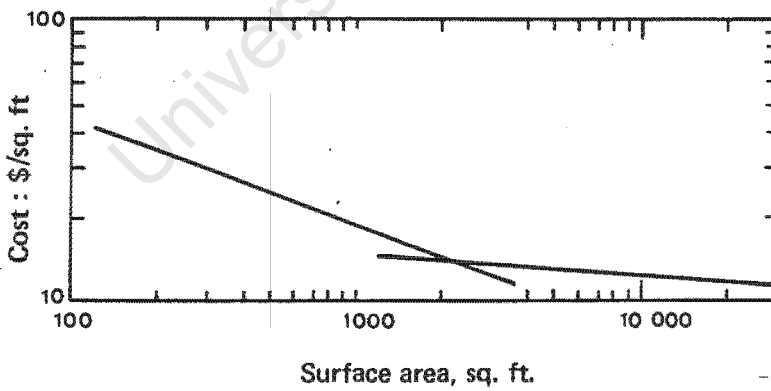
Figures quoted by Berthouex appear to show that a treatment plant of 30 Mld-1 (7 Mgd) capacity can be built to process wastewater for two-fifths of the unit cost of the treatment plant of 0,5 Mld-1 (0,1 Mgd). (722) (By way of comparison, to give a brief idea of GCT scale, the Mitchells Plain treatment works currently handles 25 Mld-1.)

Deininger and Su advocated co-operative action to achieve economies of scale. Quoting anticipated capital outlays, they pointed out that "these large expenditures will have to compete with expenditures for other public needs and it is only reasonable to

FIGURE 7.4.2.4B
 BERTHOUEX : ECONOMIES OF SCALE IN WASTEWATER
 TREATMENT (721)



Variation with design flow of works of construction cost of activated sludge works



Economy of scale of construction cost for primary sedimentation basins.
 (Showing "a transition that is about at the size where the common practice
 would be to use multiple basins for primary clarification".)

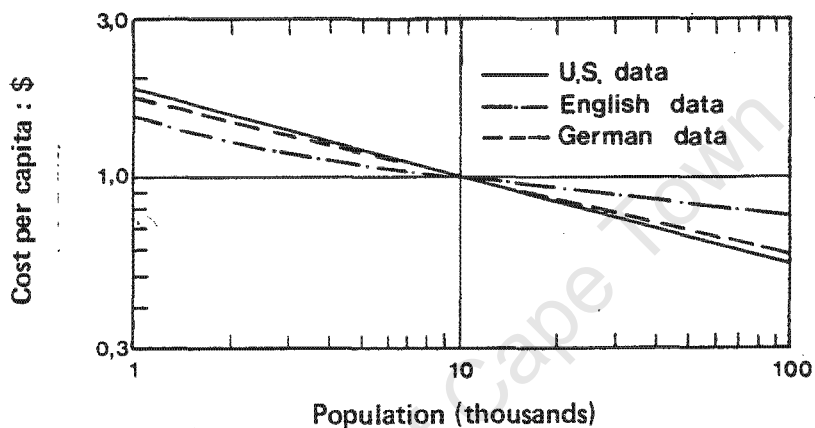
expect that these funds should be used in an economic and efficient way. In general, no great breakthrough in sewage treatment technology can be expected, at least not cost-wise. One of the hopes of lowering the costs is the joining of industries and municipalities in common treatment facilities to take advantage of the economies of scale in wastewater treatment." (723) This paper assessed not only the economies to be obtained within the treatment works itself but viewed the outfall system and sources of wastewater in an effort to obtain an economic solution for the whole. "The major question investigated is this: given a number of communities and/or industries in a geographical area, where should treatment plants be built, how many, at what time, and which intercepting sewers are necessary to connect the municipalities and industries to these plants, such that the total cost of wastewater collection and treatment is a minimum." (724)

Deininger and Su compared American, British and German data. This showed that the per capita capital costs of wastewater treatment were on an average twice as high in a small town of 1 000 than the per capita costs in a city of 100 000, and the equivalent operational costs were three times higher. (Reproduced as Figure 7.4.2.4C.) ("The cost of wastewater treatment is composed of the amortization of the construction costs and the annual operation and maintenance costs.") (726) The same paper quoted economies of scale in the construction of main trunk sewers and interceptors and also in pumping costs. It then went on to derive, and quoted several worked examples of, a method to select the most economical site given the general location problem of treatment works.

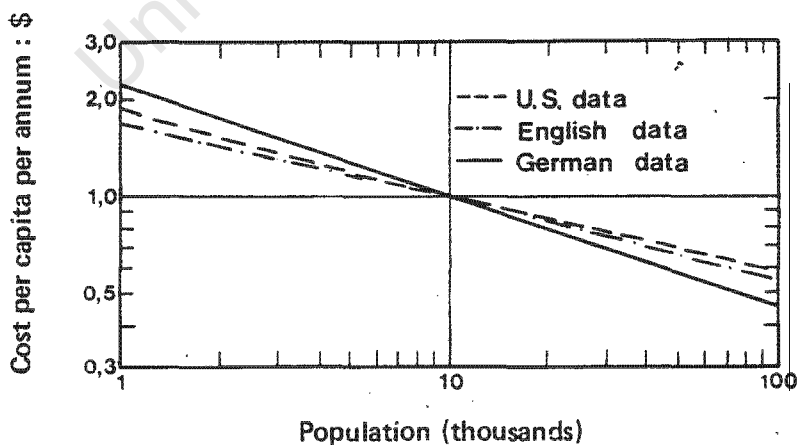
A paper by Joeres and others developed a regional model to consider the trade-off between economies of scale inherent in wastewater treatment plants and the added pipe network collection costs. The paper focused on the development of a computer model to select an optimal regional wastewater treatment system, "such that the entire demand for wastewater service is satisfied at the lowest overall cost to the region, without violating any of the environmental impact (i.e. capacity) limits at the sites selected for the original plan." (727)

FIGURE 7.4.2.4C
 DEININGER AND SU : ECONOMIES OF SCALE IN
 WASTEWATER TREATMENT (725)

Unit cost \$/mgd



Variation with population of construction costs per capita of activated sludge works



Variation with population of operation costs per capita of activated sludge works

This paper pointed out that the cost curve can be "approximated by a piece-wise linear approximation consisting of linearized segments." Applied to an actual example in Wisconsin, a comparison of the "optimal plan" with the then development plan for the region indicated "a possible cost saving of ... about 10 per cent of total system cost. ... A mathematical programming formulation is developed to select an optimal regional wastewater treatment plan accommodating the exploitation of both unit treatment and piping cost differences as a function of location and economies arising as a function of scale. The objective is an efficiency objective to minimize total regional cost; equity or other considerations are not included". (728)

Another method, by Brill and Nakamura, for evaluating alternative regional wastewater treatment systems also took into account economies of scale in constructing treatment plant and interceptor sewers. (729) "This views a regional water allocation problem ... as a network problem with economies of scale in the costs for the supply facilities, such as reservoirs or water treatment plants, and for transmission lines." (730)

A paper by Pingry and Shaftel highlighted the change in emphasis required of regional wastewater systems if the intention is to recycle the wastewater after treatment. "For example, sewer systems have generally been designed to take advantage of gravity as much as possible. This is fine as long as the goal is simply to remove the effluent from the city and return it to the natural cycle. However, if the effluent is to be reused at a point which is not downstream of the city, it may make sense to incur higher transportation cost in the collection system rather than incurring transportation cost after treatment of the effluent." That is, the point of collection of the effluent might perhaps be selected with the point of reuse in mind rather than simply discharge to a watercourse after treatment. (731)

Thus each paper of the set described is an advance on the one before it, in terms of taking into account firstly the increasing understanding of wastewater treatment and secondly the increasing emphasis on reuse. "The possible economic feasibility of reuse and recycling dramatically increases the complexity of designing an optimal water delivery system." (732)

Further studies found economies of scale in most of the constituent parts of the treatment process, and in the treatment as a whole.

The pioneer South African study of "the size effect and scale" was that by Hall, who superimposed South African cost data on charts which illustrated the effect of size on the capital and maintenance costs of works. "It can be seen that while there is not much saving in cost to be achieved by constructing a works larger than 20 million gallons per day [90 Mld-1], below this figure the cost per million gallons per day increases rapidly as the size of the works is reduced. The same relationship is shown in regard to maintenance costs on various sized works." (733)

"It may appear at first sight that the size of a works is fixed by factors which are beyond the control of the designer. This is, however, not always the case. There is the not infrequent case where an engineer must weigh up the pros and cons of constructing two or more small works, or one larger one. There is also the more exacting question which arises when it is necessary to decide if an existing works should be abandoned and be replaced by a better sited larger plant, or if it should be retained and a new works built to take the surplus flow only. It is this factor which presents such a strong case for joint schemes, and there are undoubtedly a great number of conurbations and smaller communities in this country which would benefit from combining to carry out a joint drainage scheme." (734)

Bolitho compared the components of the capital and operational costs of treatment works in South Africa with those quoted by Townend for Britain, and concluded that the principle of the capital cost of treatment works per capita falling significantly with increases in the population served held for South Africa as well. "The three main factors contributing to these savings are: (a) the inherent economy of large components, (b) the substantial economies in actual construction costs which are possible when building a large undertaking, and (c) savings in running costs of large-scale works through reduced labour requirements and overhead charges." He noted that: "When a large works is under consideration, it is detrimental to build section by section. Economy in capital costs is achieved by increasing the size of individual components to the maximum

practicable size having due regard to the need for a sufficient number of each unit for flexibility or standby purposes. The full extent of the savings in total annual expenditure through increased scale of operation forms a strong argument for the regionalization of treatment facilities; small communities stand particularly to gain from participation in a large scheme." (735)

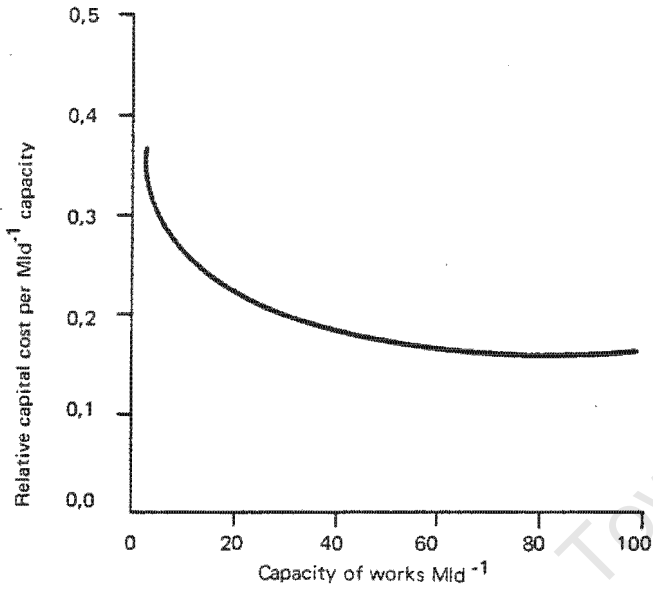
A study by consultants to the President's Council noted (Figure 7.4.2.4D) the scale effect of both the relative unit capital and maintenance costs of treatment works. No source was given for the data, and the vertical axis was expressed in money units which were not identified, which suggests that the graph was based on an amalgam of evidence.

The study continued as follows. "Wastewater systems, which are monitored by the Directorate of Water Affairs, are highly demanding of highly skilled professionals for reliable and economic operation. The economy of scale is, however, significant. As an example, the largest system in the Witwatersrand, treating the water from some 1 1/2 million persons, has the equivalent of one skilled professional per 28,75 Ml of wastewater treated, while one city of 150 000 population has one professional for every 11,4 Ml treated. This clearly shows the advantages of regionalisation in the use of manpower in a region such as the central Witwatersrand.

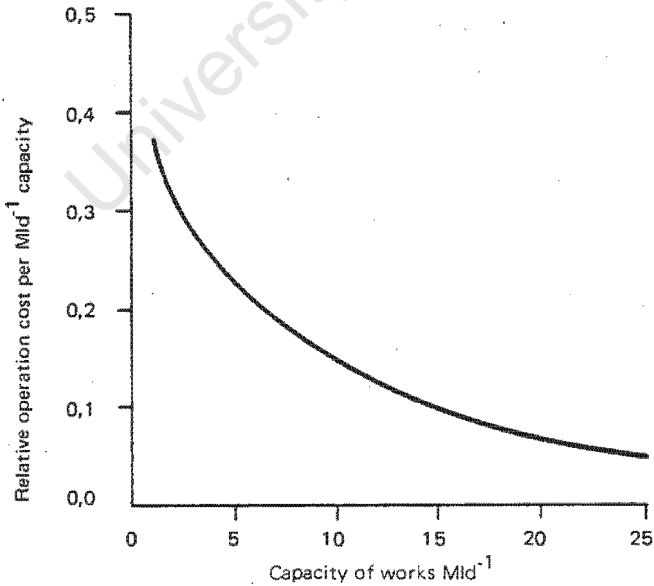
An analysis of charges made for services in 40 towns and cities [where these are is not stated] shows clearly the economy of service in the large authorities. [Reproduced as Figure 7.4.2.4E.] This is essentially the result of the economy of scale." (738)

It should be stressed that the conveyance costs could well be a very significant factor in deciding whether any two particular local authorities would share centralized wastewater treatment facilities. Quoting costs for the Northern outfall project, Bolitho remarked upon the fact that the main outfall sewers cost more than the treatment works. (739) Especially if areas to be served are in different catchments, then additional conveyance costs, particularly pumping costs, could very well swamp the economy otherwise available from a pooling of resources at the treatment works in order to achieve economies of scale.

FIGURE 7.4.2.4D
 INDUSTRIAL DEVELOPMENT CORPORATION :
 ECONOMIES OF SCALE IN WASTEWATER TREATMENT
 (736)



Variation with capacity of works of capital cost of wastewater treatment works



Variation with capacity of works of operation cost of wastewater treatment works

The great influence of the topography of the area served was stressed in an Australian study which utilised data for reticulation, trunks, treatment capital and treatment operating costs separately, and compared and combined them in an idealisation of the form of the urban area and of the form of the wastewater system. The purpose of the study was to discover the economies of scale of the total as the urban area grew from 100 000 to 2,5 million population. Reticulation costs, which per capita do not significantly vary with urbanised size, made up for all sizes about 60 per cent of the total. Trunk sewer costs increased per capita with increasing urban area size, while both capital and operating costs of treatment decreased. "The total cost curve is very flat with a minimum point for about 1 million people." (740) (Figure 7.4.2.4F refers.)

"In the real-life situation many factors may operate to change the position and shape of the cost curve. For example, the topography of a city must be examined closely before sewerage costs for that city can be predicted accurately.

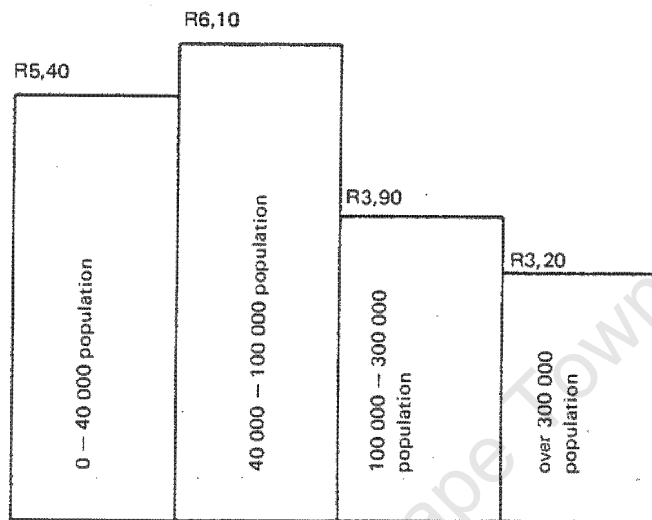
Some of the factors which may be important are -

- variability of terrain, particularly slopes and soil conditions;
- discontinuities in urban form;
- costs of additional facilities such as pumping stations ...; and
- level of treatment and environmental impact of effluent flows."

(742)

The cost of trunks is sensitive to the development pattern as well as to urban area size. For example, an urban area growing towards the treatment point has higher initial trunk costs, because of the extra length of spine trunk required for the first time period, than an urban area located close to the works and growing away from it. The study therefore pleaded that the cost of trunk engineering services be taken into account as a significant factor in deciding on the location of additions to urban development. An urban area with widely dispersed sections of development, the model showed, may be better off with two or more treatment works, because the economies of scale in treatment may be swamped by the diseconomies arising from the longer trunks required by a single works.

FIGURE 7.4.2.4E
 INDUSTRIAL DEVELOPMENT CORPORATION :
 DIMINISHING WASTEWATER CHARGES TO SCALE
 (737)



Mean wastewater charges per month by population size of towns and cities

The problem of trade-off between economies of scale, favouring a few large treatment works, and the cost of trunk sewers was considered in another paper. Briefly: "One does not contemplate large, long sewer lines very long before wondering whether or not some distributed type of treatment might be effected." (743)

It was noted in the report to the President's Council that: "The advantages of scale are partly, sometimes wholly, negated by other factors, largely related to the physical extent of the area to be serviced and the availability of land. Regional water and drainage schemes, for example, are needed invariably for metropolitan areas where long lengths of large diameter water mains or sewers are required to connect to the facility. With smaller systems, and fewer constraints on the selection of suitable sites, such connecting mains are in general much shorter.

Topography and other specific aspects of each individual urban centre makes [sic] generalization difficult, but the pattern is clearly that as far as the large cities are concerned, the larger they are the greater is the unit cost of trunk services. ...

Regional works ... usually have to be located remote from the areas where the flow is derived, and costs of conveyance become high. In Johannesburg, where outfall sewers must be of high capacity to accommodate future growth and moreover are very long, conveyance costs, including reticulation and outfall sewers capital and maintenance costs, amount to 9,62c/kl, while the operating costs of the main outfalls alone, including capital charges, amount to over 21% of the total operating costs, or 3c/kl." (744)

The above is an argument against larger urban areas. (This argument must of course be balanced against the other advantages of living in a larger urban area!) It is not an argument against larger local authorities.

Finally, it is important to note that consolidation offers a very real advantage in the deployment of skilled manpower. A single engineering organisation which replaced several smaller organisations could more effectively (through avoiding duplication) use engineers and other skilled staff, could possibly reduce their numbers, and could attract better staff, capable of handling more sophisticated processes, with the higher salaries offered.

The findings of this Section 7.4.2.4 may thus be summarised -

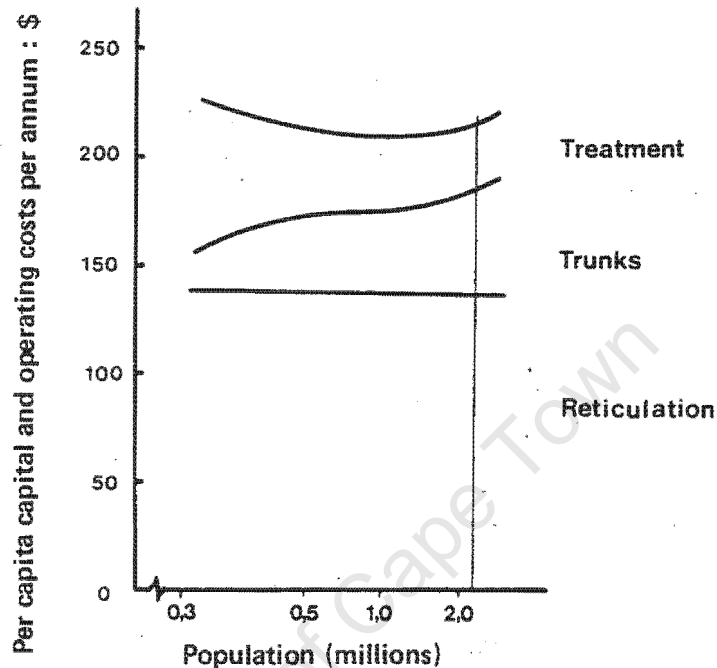
- there are substantial economies, in both capital and operating cost, with increase in scale of treatment works; but
- these economies must be balanced against costs of conveyance; however
- the larger the urban area the more essential it is that the different local authorities co-operate in order to rationalise location of facilities vis a vis developed and developing areas and the topography and other natural factors, and in order to take best advantage of the available expertise.

The literature search failed to turn up any studies with findings contrary to the general tenor of these opinions reported.

7.4.2.5 Agencies

It is virtually (if not completely) unknown for local authority responsibility for sewerage and wastewater treatment to be carried out to any significant extent by private enterprise.

FIGURE 7.4.2.4F
 AHERN AND BOYCHIE : ECONOMIES OF SCALE IN
 WASTEWATER TREATMENT (741)



However, private enterprise does have a role. Hall strongly made the point that social costs of gross pollution should be thrown onto the polluter. "There is no doubt that the control of industrial effluents is highly desirable, if not essential, not only to distribute the costs of purification more fairly among the responsible elements of the population, but to prevent gross effluent discharges which are often easily avoided." (745) Since that passage was written steps have been taken, in all the countries considered in this chapter, to enforce industrial effluent policies.

7.4.2.6 Location of responsibility

7.4.2.6.1 Introduction

The sewerage and wastewater treatment service is one in which the standards laid down by adjacent local authorities should match within limits. The presence of considerable externalities requires that this service conform to agreed minimum standards, otherwise neglect by one or other local authority can have very detrimental effects on the well-being of its neighbours. For good reason

therefore, it is the norm in most nations for the central or provincial authorities to lay down standards of wastewater treatment.

7.4.2.6.2 Canada

In Toronto, the comprehensive investigation by Robarts noted that "responsibility for water, sewers, drainage, and garbage is shared between Metro and the area municipalities. In general, the Metropolitan Municipality acts as wholesaler, providing the major facilities, while the area municipalities do the retailing and provide the local connections. [Metro is responsible for trunk collection sewers and all wastewater treatment, while the area municipalities are responsible for local sewers and individual connections.]

One of the principal reasons for the establishment of the Metropolitan system of local government in 1954 was to facilitate the extension of basic physical services to the still largely rural outlying townships. ... It is a tribute to the Metro system of government that just a few decades later, the residents of this Metropolitan community enjoy one of the best water supply systems in the world, a high standard of sewerage and sewage treatment, and a vastly improved protection from flooding." (746)

"The costs of the sewerage system are largely financed from local general revenues, although sewage imposts are usually charged against new subdivisions and redevelopments. Some provincial subsidies are also available for capital works. The Metropolitan Municipality adds a surcharge to its water rates for water pollution measures." (747)

The technical report by MacLaren found that in Toronto "the present level of [wastewater] treatment provided at the four metropolitan plants meets all provincial standards." (748)

"The checking and enforcing of the Industrial Waste By-laws must be done by the area municipalities, since the industries discharge into their local sewers. However, the Metropolitan Corporation assists the area municipalities in this regard." (749) The quality and allowable strength of industrial waste is regulated and each

industry is assessed those additional treatment costs caused by its individual waste products.

MacLaren reported that several instances had occurred where it had not been possible to reach agreement in cost-sharing arrangements between municipalities within the metropolitan area and municipalities or the regional authorities outside the metropolitan area. In a number of instances, "facilities are extended only to the municipal boundaries and effectively terminated". (750) MacLaren did not state what was being done to resolve these problems.

7.4.2.6.3 United States

Separate authorities for the various services are common in the United States. When a sanitary district received responsibility for the disposal of both wastewater and solid wastes, this was sufficiently unusual for it to be remarked upon. "Most sanitary districts in the US are charged with a single responsibility, collecting sanitary wastewater and other wastewater in their territory and treating it so it can be discharged to a stream in an environmentally safe way. But the Western Lake Superior Sanitary District, serving Duluth, Minnesota and surrounding areas is different. It is the first sanitary district in the US to be charged with the responsibility for safely disposing of both wastewater and municipal refuse." One of the resultant bonuses is that the solid wastes serve as the fuel to burn the solid sludge produced in the wastewater treatment process. (751) "But collection [of solid wastes] in the municipalities and townships would remain the responsibilities of private haulers." (752)

As an encouragement to regional solutions for wastewater disposal problems, all applications made after 1967 for Federal loans or grants to assist in carrying out sewerage and waste treatment works have had to show evidence of planning at the regional level. Sewerage and wastewater treatment in the United States remains however characterised by "fragmentation of authority among many tiers of government and overlapping geographical jurisdictions, with most authorities being far too small to implement sound policies and programs." (753)

Many reasons have been cited for the difficulties in adopting widespread regionalisation in the United States. It is interesting to note that the "most important of these is the reluctance of communities to yield sovereignty over their own water supply and sewerage systems which provide them with the only sure control of rate and direction of growth. Communities have little confidence, for good reason, in their ability to manage growth and development through land-use control, zoning, and other direct regulatory devices and so they have fallen back upon the indirect, but effective method, of using the installation of water lines and intercepting sewers to determine the rate and location of growth."
(754)

Nevertheless, there have been quite a number of instances of regionalisation in the United States. Okun cited regional councils, cities, water boards and authorities, counties, and river basin authorities. Large cities which have independent financing powers, in several instances (e.g. Chicago, Miami, Detroit, San Francisco) serve areas outside their political boundaries. "A major drawback to this approach is that consumers outside the city are not represented in management." Water boards or authorities on which all the local authorities concerned are represented have found favour in a number of metropolitan instances, including Boston and San Diego. "While the taxing powers of such authorities may be limited, they may utilize the taxing power of their constituent members." Counties have the advantage that they are existing governmental entities but the disadvantage that they are seldom related to appropriate hydrological or people-based boundaries.
(755)

"The potential for regional management of our public services is uncertain despite the fact that regional government has long been recognized as a useful approach to achieving efficiencies and economies of scale while ending conflict among political jurisdictions. Many efforts at urban regionalization have failed because of the resistance of inner city residents who are afraid of being electorally overwhelmed by suburban populations, and by the resistance of suburbanites who feel that they will have to take up the financial burdens of the inner cities. ... The idea of sharing public services has not had much appeal nationally. Few politicians

seem willing to surrender the power, prestige, and patronage traditionally derived from running one's own departments." (756)

The Delaware River Basin Commission, an agency based on an area defined by a river catchment has, possibly because of opposition from vested interests, not served as a prototype for similar agencies in more than two or three other areas. (New York City is one of the areas which draws from this basin.) "The central objective was to create a river basin commission that would devise and administer a comprehensive multi-purpose water resources plan which would bring the greatest benefits and produce the most efficient service in the public welfare." The Commission has five members, one from each of the four member states and one from the federal government. (757) Formal agreement gave the Commission extremely broad powers for the direct implementation of various measures affecting quantity and quality of water in the basin, both surface and ground. The Commission exercises such powers only if another federal or state agency cannot or does not provide the same functions efficiently in accordance with the comprehensive plan.

"Wastewater and water supply planning and management in the Washington DC metropolitan area is fragmented among local, state and Federal governments and agencies." This leads to the complex situation whereby the several agencies which have decision-making authority or regulatory authority or both "are taking somewhat independent steps to increase their ability to serve their consumers." (758) However an Interstate Commission on the Potomac River Basin (ICPRB) has been set up which "attempts to assist with coordinating the actions of the agencies involved and mediating disputes among them, and serves as a source of technical information. ... One is compelled to conclude that wastewater management will continue to be fragmented, but considerable regionalization does exist under interjurisdictional contract. The latter probably would be extended, slowly and incrementally, partly influenced by voluntary actions of local governments and partly under pressure of state water pollution control agencies, the USEPA [United States Environmental Protection Agency], and the courts." (759)

Fortunately, interest in regional co-operation on water and wastewater matters has blossomed in the last decade. An investigating committee of the American Water Works Association (AWWA) urged regionalisation which it defined as "(i) a creation of an appropriate management or contractual administrative organization, or (ii) a coordinated physical system plan of two or more community water systems in a geographical area ..." (760)

A member of the above committee wrote as follows: "There are a number of reasons that can be submitted to justify creation of an areawide utility." His remarks may most pertinently be applied to the whole water cycle, i.e. including potable water and wastewater in all their aspects and processes. The reasons are as follows:

- "i) ... Inadequate revenue bases are at the root of a small system's inability to attract a fair share of managerial and technical professional personnel. Limited fiscal resources also restrict improvement and expansion capabilities.
 - ii) Problems of allocation and competition among systems for diminishing water sources are alleviated.
 - iii) Regional facilities provide opportunities for economies of scale not possible with small, independent utilities, such as pooling of fiscal and revenue resources; effective, centralized, high-level supervision of all water systems in a region or county; coordinated implementation of environmental safeguards; a single laboratory to serve all systems; ...
 - iv) Large water systems can make conservation measures more effectual, promulgate a uniform rate structure, and integrate long-range planning with local needs and regional coordination and economies. The larger system usually has an increased capability to build immediately and lessen cost escalation."
- (761)

"Most observers agree that the pressures for regionalization in the United States should originate among local authorities rather than the federal government. Local authorities will abdicate sovereignty, a necessary step for regionalization, only when it is clearly in their self interest to do so." (762)

7.4.2.6.4

Britain

Maud in 1969 advocated that : "All main sewers and sewage disposal works should be the responsibility of the metropolitan authority, which should also control the discharge of trade effluent to sewers. Local sewers and drains should be the responsibility of district councils." (763)

However the central government of the day decided not to accept this advice. Legislation in 1973 scheduled a major reorganisation of water management which was implemented on the same date (1974-04-01) as the general reorganisation of local government. The regional water authorities which were formed are thus responsible for virtually all matters relating to the management of water and its uses. Each water authority was, with minor exceptions, given responsibility for the ownership, planning, design, construction, operation, and finance of facilities for -

- the conservation, augmentation, distribution and use of water resources and the provision of water supply;
- provision of sewerage and the treatment of wastewater;
- the restoration and maintenance of rivers and other inland waters, estuaries and coastal waters; and
- fisheries and navigation in inland waters.

It is interesting to note that each water authority has a fair amount of freedom to set its own priorities; the different physiographic, climatological, economic and cultural differences may cause "some WAs [to] give higher priority to providing improved water services while others may concentrate on improving the quality of their surface waters for recreation and amenity purposes."

(764) "'It is an essential feature of the system we use for controlling pollution discharges that decisions about the precise levels of pollutants which may be allowed should be taken by WAs in the light of differing local circumstances. It makes a great deal of difference to the level of controls if the discharge is made into an inland river used for drinking supply, or into an estuary or the sea.'" (765)

These regional authorities make extensive use of agency powers. District councils generally act as the agents of the water authorities in respect of reticulation and estate-scale sewerage

(planning, detail design, construction, maintenance and responsibility for enforcing by-laws and effluent discharge regulations). Construction and maintenance work is done by direct labour or by contractors - in practice most water authorities and district councils have direct labour organisations for routine maintenance work, but new construction and improvement work is normally carried out by contractors. (766, 767)

It is pointed out above that utilities planning "has become a surrogate for land-use planning in the United States, the latter being politically distasteful." In Britain however, "decisions as to community growth rest on local authority decisions and the water authorities are obligated to meet water and sewerage needs of the local authorities. The location of water and sewer lines is not considered the proper device for controlling community growth." The land-use planning function is the proper means, and is one of the powers retained by the local authorities. (768)

"A substantive accomplishment of the WAs after the ... reorganization was their taking inventory of their inheritance from the predecessor authorities and addressing the problems that appeared. Old and dilapidated works were abandoned and others were regrouped. 'Technically and scientifically the increase in scale of the new management units for sewage treatment and concentration of existing resources of men and equipment have in general substantially raised the effectiveness of maintenance and process control where predecessor authorities were relatively small'. ... The WAs promoted the more efficient use of water resources enabling some schemes for new works to be deferred. ... The Financial Times (London) assessed the restructuring as ... 'by far the most radical and, perhaps for that reason, ... more likely to endure' because the WAs are large enough to plan the development of their water resources on effective scale.

Centralization is often expected to result in new layers of bureaucracy, with substantial increases in personnel. This has not, in fact, been the case. In a special study of pre- and post-reorganization manpower requirements, the Anglian Water Authority (AWA) found that the total number of employees rose ... by a 1,5 per

cent increase. Against this exceedingly small increase, the AWA has achieved: (i) a greater capacity for in-house design work, effecting a saving in consulting fees; (ii) the amalgamation of 21 water boards into 10 water divisions, realizing savings of about \$200 000 per annum in staffing costs; and (iii) more efficient operational and maintenance standards and more effective and remunerative trade effluent control resulting from full-time staff available to even the smallest facilities.

For the water industry as a whole, 58 385 staff were employed after 1 year, about 60 per cent of whom were manual workers. Prior to the reorganization, an estimated 65 000 were employed. Certainly no major increases in personnel were involved in the reorganization, although a wider range of services is being offered." (769)

The historical connection between water services and local communities has led to the water authorities' unique constitution having characteristics of both a local authority and a nationalised industry. Policy is decided by unpaid members; they delegate the execution of that policy (and the making of a great many consequent decisions) to the Chief Executive and employees.

A paper by Wilkins confirmed Okun's laudatory remarks on the basic philosophy behind the water authorities, commenting "there seems to be a general acceptance that the original structure has worked well." This paper is worth reading for its commentary on the organisation, work and some of the problems of a dual-function (water and wastewater) division. It points out that, within the water authority, sewerage and wastewater treatment is the responsibility of one set of divisions, the water supply function is the responsibility of a second set of divisions, and the land drainage function is the responsibility of yet a third. However in some cases the boundaries of these divisions coincide, and in those cases it is usual that the divisions are combined. (770)

An assessment of the Thames Water Authority stated that "the principles on which the Water Authorities were founded were right." (771) For example, "the restoration of the tidal Thames from a typical grossly polluted metropolitan estuary to its present excellent condition" was greatly facilitated by "the principle of

integrated river basin management". (772)

(A more detailed description of the organisational aspects of the water authorities may be found in GCT reform, 1982. (773))

7.4.2.6.5 Australia

In Sydney, a metropolitan board is responsible for the conservation, preservation and distribution of water throughout its prescribed area (which considerably exceeds the metropolitan area as such), for the provision of sewerage facilities and for the construction, control and maintenance of main stormwater channels. It supplies water for a population of 3,2 million and sewers an area for a population of 2,9 million. (774) It raises its finance by rates on the assessed annual value of properties.

"The board consists of ... members appointed by the Governor [of New South Wales]. [The members] are nominated by the Minister - three from a panel of Council Officers submitted by the Local Government Association of NSW and three with 'special knowledge and experience in such fields as the Minister deems appropriate'". (775))

In Adelaide, the South Australian Department of Engineering and Water Supply is the body responsible for the water and wastewater service in Adelaide. In Perth the Metropolitan Water Supply, Sewerage and Drainage Board is responsible for water supply and reticulation and sewerage treatment and reticulation. (776)

7.4.2.6.6 South Africa

Inter-local authority co-operation in wastewater treatment occurs in several areas where mutual convenience may be cited. A good example is found on the Witwatersrand, where the Johannesburg Municipality treats wastewater from quite a number of local authorities in the metropolitan area. However reticulation is in every case the responsibility of the local authorities directly. For example, Johannesburg treats all wastewater from the municipalities of Bedfordview, Sandton, Randburg, and Edenvale; none of these municipalities has treatment works of its own. Nor has the West Administration Board facilities of its own; Johannesburg's

Olifantsvlei and Klipspruit treatment works between them receive the whole of Soweto's wastewater, while also treating portion of the Johannesburg municipal area. Alberton, Germiston and Roodepoort have their own treatment works but find it convenient to allow Johannesburg Municipality to treat part of their effluent, i.e. that from areas within the watersheds drained by treatment works belonging to Johannesburg. In all these cases, Johannesburg charges for the service. (777)

In terms of Section 21 of the Water Act (Act 54 of 1956), the central government's Directorate of Water Affairs (DWA) is responsible for assessing applications for permits to discharge effluent (from treatment works or from any other source). (778) DWA is also responsible for monitoring any other situations where the Health Act or Water Act can be invoked to prevent pollution of underground or surface water supplies. (779) Thus the central government is exercising control over standards of wastewater treatment, and these standards are steadily increasing.

That the matter of regional co-operation in respect of wastewater treatment was of concern to the central government was shown when in 1974 the Minister of Water Affairs appointed a committee to consider aspects of municipal and regional wastewater schemes. The Chairman, Mr J L Stallebrass, was the Adviser on Water Affairs to the Minister. Representation on the committee was granted to the provincial administrations, several central government departments, the City Councils of Johannesburg, Durban and Cape Town, the Rand Water Board, the United Municipal Executive, the S A Federated Chamber of Industries, a consultant and a town engineer. (780)

Stallebrass found that regional wastewater treatment undertakings could well be justified under certain circumstances. Furthermore the concept could advantageously be expanded to make provision for the unified control, operation and maintenance of a number of hitherto separate undertakings, not necessarily within the area of the same local authority, by a central body able to employ specialist staff. "The committee believes that there is in principle no reason why a Regional Authority should not, where the need exists, undertake all the necessary sewage functions as Escom does in respect of electricity services in some areas. Act 55 of

1974 ... empowers Provincial Administrations to establish Regional Corporations which in addition to establishing and controlling Regional Sewage Treatment Schemes, may also undertake the provision of any service otherwise provided by Local Authorities, and there may well be areas where such an arrangement may be advantageous."

(781)

It is of interest to note that all of the arguments advanced by Stallebrass in favour of a regional sewerage board would also count in favour of a regional authority which embraced all services. (782) This latter authority would have the additional advantage of permitting greater co-ordination among services.

Note also that "the committee recognised that where effective regional planning and development of sewerage facilities are being pursued as a result of co-operation and mutual agreements supervised by the Provincial Administration between a 'core' city such as Durban or Cape Town and other adjacent local authorities, the status quo should not be disturbed by establishment of a separate regional sewerage authority, unless this is requested by the [local] authorities concerned or is considered essential by the Provincial Administration." (783)

It would seem that those findings of the Committee which motivated change have not been implemented. One recommendation was that the first area in which a regional sewerage authority should be created was the Pretoria-Witwatersrand-Vereeniging area. The statutes of the Rand Water Board were, it was envisaged, to be amended to expand the Board's constitution, functions and responsibilities. "Its functions would include the supply of potable water in bulk, the provision of trunk sewer systems and sewerage purification works, the bulk disposal of municipal and other solid wastes and the performance of all the allied tasks necessary for efficient water resources management within its area of jurisdiction." (784) Stallebrass himself confirmed that he knew of no White Paper or any other form of policy guideline which had been published pursuant to the recommendations of his Committee's investigations. (785) Evidently these recommendations did not find favour with the Minister.

It should be noted that Hall as far back as 1957 advocated "the establishment of one single authority - a Rand Sewage Board - with full control of sewage purification including main outfall sewers", in the Witwatersrand. Having described the drainage areas in and around Johannesburg, he pointed out for the purposes of illustration two drainage valleys which had been very economically developed and two others which by comparison had not been well planned. "The economy to be derived from making the scale of operations large has been fully realised in only two major valleys, where there are two and one works respectively, [both of large capacity]. ... The two other valleys ... are most uneconomically developed; the former will have, as planned, at least three works with [small capacities] ... and the latter eight works with the same size variation. The reason for this uneconomic planning is obvious. The two economically planned valleys are both dominated by one large authority, i.e. Johannesburg, while in the others there are numerous authorities with more or less equal interests and with no single planning body." (786)

7.4.2.6.7 Germany

The water management of the North Rhine Westphalia area of West Germany involves unified control of the whole water cycle, i.e. including water resources, water purification and wastewater. (787)

7.4.2.7 Conclusions

Regional wastewater systems have obvious advantages inter alia in terms of economies of scale in the treatment process, and rational design of sewerage on the basis of complete and not fragmented catchments. However, experience has shown that these economies of scale do not extend indefinitely, and furthermore, that there is a point at which the conveyance costs of the wastewater cancel out the economies of scale in the treatment. In addition, in planning regional systems, many factors other than economic efficiency come into play. Nevertheless, the arguments in favour of regional responsibility for the larger scale aspects of the wastewater service are strong.

As Deininger and Su stated: "There are many other advantages to regional systems which are not easily expressed in economic terms. Among them are that there is a central authority with complete responsibility for systems expansion and operation, which eliminates the many problems [involved in] adequately staffing and training the operators of small treatment plants. This should lead to better qualified personnel, better management of the plants, and top performance of the treatment plants. Studies ... indicate, for example, that there is a high correlation between the size of the treatment plant and the percentage of time during which the plant fails to perform according to design standards. The larger the treatment plant, the more reliable it is." (788)

The need for integration of sewerage and wastewater treatment planning with the planning of inter alia housing, places of employment, environment, and land use generally, cannot be gainsaid.

The last word should belong to the concluding passages of an article on the "Jewel of the Adriatic".

"Venice in fact offers a textbook study of the disadvantages of [responsibility for a service being split between] several tiers of government. The central government in Rome is responsible for the tidal problem and for the restoration of public buildings. The regional authority is responsible for dealing with pollution and the sewerage system. The city itself is responsible for refitting and restoring the houses in which the Venetians live. Also involved are 30 organisations in 14 different countries, all devoted to saving Venice. It goes to show that goodwill and money are not enough. Careful planning and co-ordination are equally vital if the cradles of our civilisation are to avoid the grave, and if our heritage is to be preserved for posterity." (789)

7.4.3 TRANSPORT PLANNING

As noted above, this Section 7.4.3 is largely a revised and abbreviated version of the relevant description in the GCT study. (790)

7.4.3.1 Purpose of the service

"The need for metropolitan transportation planning is evident from the existing travel conditions in our cities when compared with the past allocation of financial resources to effect improvements. While much progress has been made in the construction of urban freeways and expressways little has been done to improve bus and rail transport facilities which have the ability to carry large volumes of commuters in relation to the area of land utilised for such facilities. Public transport also provides mobility for the less affluent section of the urban population whose members play an essential part in the economy of our cities and country." (791)

Smith and Mackey noted that: "The present overall aim in the urban transport scene is to improve the quality of life of the urban community. We want to help make our urban areas places where people can live, work and have their recreation in a pleasant and efficient manner." (792) They went on to emphasise that whereas the mobility of people is the aim of a transport service, sight must not be lost of the role which the transport planner can play in reducing the need for travel, if this improved the quality of life. "If we are to reduce the need to travel then there is a requirement that urban land use development and transport systems be planned in a complementary manner and not in isolation." (793)

Driessen formally stated the goals of urban transport planning. Urban transport "derives its utility from the 'service' rendered to other economic and social activities, which relate back to land use. Thus a goal of the transportation system must be to serve existing land use efficiently. The transportation system in turn has a profound effect on the location of various land uses, and it can thus be used as an instrument in moulding the future city land use pattern. The ultimate goal of urban transport therefore must be to serve the land use, both existing and future. The essence of this service is mobility, and thus mobility may, analytically speaking, be regarded as a first major goal of urban transport planning or policy, while the actual purpose for which the mobility is required only enters into the picture when 'more distant' or 'second order' objectives are considered.

The attainment of mobility, however, usually involves a measure of inconvenience to the transport user, and the requirement of convenience thus becomes a second major goal of policy or planning. On the other hand, an overly convenient service may entail inordinately high costs, and reasonable costs should therefore be another goal. [Again, there is a conflict between "effectiveness" (convenience) and "efficiency" (maximum reasonable benefit for minimum reasonable cost) : see Section 1.2 above.] The current concern about the environment has focussed attention on the negative side-effects of transport and other activities, and a fourth major goal would thus be the requirement of minimum side-effects which are injurious or undesirable to health, the environment and other spheres where human welfare may be affected." (794)

"It is obvious that the various goals and objectives will not always be fully compatible with one another, and this means that difficult choices will often have to be made in order to establish the most 'desirable balance' in the formulation of urban transport policy." (795)

However this thesis prefers that accessibility, rather than mobility, be the most important long-term criterion against which the success of a transport planning policy is measured. The term "mobility" has connotations of travel for its own sake, whereas what ought rather to be measured is mobility in terms of the primary objectives of communication and transaction - "accessibility" is a better term to describe this.

The goals of services such as wastewater are within broad limits generally agreed upon by all sections of any community. Transport planning is not so blessed - needs for and perceptions of the service and its goals typically differ very widely in principle and in detail within any metropolitan area.

Cravens et al, in an analysis of "the efficiency of alternative organisation arrangements", found that "to fail to establish the basic mission, purpose, and goals of public transportation leaves to chance the important task of coordinating services." (796)

7.4.3.2 Facets of the service

General heading	Material	Processes
Transport planning.	Permanent way. Rail facilities. Bus facilities. Private cars. Other road vehicles. Parking and servicing facilities. Mode interchange facilities.	Pedestrian travel. Cycle travel. Rail travel. Bus travel. Car travel. Other vehicle travel. Passenger traffic. Goods traffic.

7.4.3.3 Comparison

It is clear that the measurement of the productivity of transport is a complicated subject. Comparisons of the unit costs, or cost-benefit analyses which use only monetary costs and benefits, are clearly too restrictive. In order to understand the productivity and efficiency of a transport operation, it is essential to understand firstly the background factors which affect the operation and secondly the quality of the service. Among the factors which determine the background can be enumerated -

- the urban form: sprawl, linear, or other pattern;
- the characteristics of the residents, with their differences in prosperity, car ownership, need to travel to other regions of the city, desire for mobility and so on; and
- the transport infrastructure historically bequeathed.

These factors summarised above may now be considered further in a brief survey of opinions on the comparability of transport planning from one city to another.

Firstly, the difficulty of making this comparison is well illustrated by a recent reference to the attempts to establish a causal relationship between transit and changes in land use and development patterns. "In the continuing battle among the larger US cities to lay claim to some of the limited Federal funds available for new urban rail transit systems and extensions, great efforts are expended in trying to prove that the transit investment will lead to large and desirable changes in the pattern of urban development. It

is typically claimed that such changes will occur through some combination of improvements in accessibility... These changes in land use, it is argued, will create higher urban densities and thereby expand the transit system's ridership base as well as help in reducing the region's private vehicular travel needs, fuel consumption, air pollution, noise, and generally enhance the quality of life.

All of this is intuitively appealing, and is also in reasonable accord with the limited theoretical foundations we have for understanding the determinants of land value and use. However, in view of the very high cost of such transit systems, the relatively limited capital generally available for investment in urban systems, and the need to assure the effective use of such capital as is available, more definitive proof is continually sought." (797A)

Smith and Mackey pointed out that the fault of South African urban transport planning of the last two decades has been that it has been "inclined to be satisfied with the function of designing and providing for the desires of the community without sufficient thought as to the sociological and economical effects of this approach. The demand has been largely for an expanding personal passenger car transport system." (797B)

Driessen correctly laid great stress on the "unique feature of the socio-economic structure in the Republic, [viz] the coexistence within the national boundaries of various population groups ... who have in differing degrees been absorbed into the more advanced or integrated modern economic sector. ... The urban transport problem in the Republic is affected in a number of ways by the 'dualism' in the economy. ... -

- the urban transport requirements, and thus also the urban travel patterns of the White population, are entirely different from the Non-Whites, as evidenced, inter alia, by the high car ownership rates of the former compared with the latter ...;
- the Non-Whites generally live in separate townships, whereas their points of employment are located in White areas, to which they have to be transported mainly by public transport ...; relatively long journeys have to be made to work every day."

(797C)

Smith and Mackey stated that, apart from financial costs, the criteria for consideration of alternative transport planning policies should include social costs. Among these costs they listed the following -

- the inconvenience of change of mode;
- comfort;
- "another example with which the black commuter has to contend, and which is not sufficiently appreciated by transport planners, is the security problem"; and
- protection from the elements. (797D)

The same two authors described various measures which could reduce the need for travel, or improve accessibility. Among these are the rescheduling of work activities, and the provision of non-travel communication substitutes. However, "It is emphasised that none of these approaches can lead to very substantial travel reductions on its own. Strategy should be based on a combined operation with short and long-term elements." Under the heading of short-term elements are listed transport systems management, i.e. the organisation of relatively low-cost street improvements by means of parking control, improved traffic control, park-and-ride-facilities, bus priority schemes and other measures. These are ways of improving with small investments the efficiency and utilisation of the existing transportation facilities. The authors concluded that "the mobility of people will have to be maintained as far as possible and we are looking to safe, convenient and reliable public transport and carpools to fill the gaps."

Despite the unknowns involved, "in the long term probably the greatest advances are to be made in the field of land-use planning. The Guide Plans which are being developed by the Department of Planning ... [have provided a] framework [within which] lies ample opportunity for the development of alternative transportation systems and alternative densities of development. With cross representation of Transport Planning on Metropolitan Transport Advisory Boards and Guide Plan Committees, areas of concern will hopefully be created resulting in sound land use planning to reduce the need for travel." (797E)

The question of evaluation methods, once the necessary criteria have been obtained and agreed upon, is of great interest. "In transportation there is no overall measure of productivity in its broadest sense. Instead, partial measures of some facet of transportation input-output ratios are used, such as revenue traffic per man-hour, miles per gallon, subsidy per passenger-mile, or user benefit/cost analysis." (797F)

"The economists' definition of productivity cited earlier - quantity of input versus quantity of output - implied that all factors affecting productivity are quantifiable. But how is the quality of an output quantified? ... How are the unquantifiable inputs measured? ... The public decisionmaker must be aware of the other investments required - the land, the scarce resource, the family displaced, the energy consumed, and so on. On the output side, the public sector transportation investment will presumably have a positive effect on user mobility as measured by travel time, or safety, but it may also have positive or negative effects on patterns of land use, public health, the distribution of income, or the quality of life in general.

Ideally, the decisionmaker should seek a single, aggregate measure of all direct or indirect inputs and all direct and indirect outputs, then select the alternative that maximizes the overall social utility. But there is no objective means of ranking and weighting all of the factors; and as a result, the ranking and weighting is rightfully left to the political arena." (797G)

The books and reports which consider in specific detail various measures of transport improvement are legion. A recent book on London is yet another of those that rejects on various grounds purely financial analysis, cost-benefit analysis and even London Transport's own "passenger miles per pound criterion". It is of interest to note that the authors argued, with supporting statistics, that new rail lines and roads are not the most cost-effective transport measures. They advocated instead measures such as bus lanes, rolling stock improvements, bus reliability measures, fares subsidies, roads and traffic management and parking restraint. (797H) These are the "short-term elements" identified by Smith and Mackey above.

A South African study added a few pertinent comments on public transport which would be applicable to any GCT policy considerations. It is clear, noted the study, that what the public requires from public transport above all else is reliability of service. Poor reliability implies long and variable waiting times. "Even long walks do not seem to loom large as a disutility when compared to waiting." (797I)

Many of the conclusions of these overseas studies are universally transferable, and may serve to prompt discussion of any metropolitan area's transport strategies. But the detailed community characteristics and other background circumstances of the area would need to be closely investigated first.

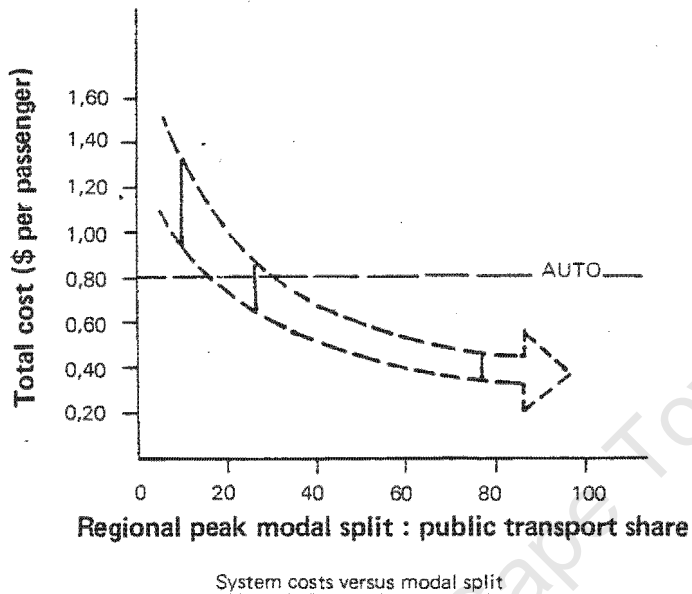
7.4.3.4 Cost function

It is of great interest to refer to the effect of scale on planning for public transport (transit). Batchelder and Kullman, reporting a study sponsored by the US Department of Transportation, plotted a graph of "the changes in transit-system operating and capital costs as the network is expanded and integrated to serve increasing shares of peak-period trips." They stated that this provided evidence of economies of scale, and indeed it does, as "increasing scale" is in this case "increasing share" of the transport demand in any area, and hence is increasing absolute size of the public transport operation. (Figure 7.4.3.4A.) The sources of these economies were inter alia identified as -

- increase in feeder services, which improve load factors on line-haul services,
- increase in reliability and frequency, and better terminal facilities, and
- use of larger vehicles, better control etc; hence improved labour productivity without a decrease in the level of service. (797J)

Mittal and Arora concluded that the "scale" against which the economies should be measured is an expression of both the urban area travel by all modes and the transit's share of that travel. "The size of the network, which may alternatively be called geographic coverage, plays a very important role in dictating the economies of

FIGURE 7.4.3.4A
 BATCHELDER AND KULLMAN : ECONOMIES OF
 SCALE IN PUBLIC TRANSPORT MODAL SPLIT (797J)



the network through its nonlinear relationship between the coverage and the number of patrons." (797K) The critical point is that there must be "good connectivity so that people can rely on public transportation. During recent years, there have been a number of experiments which provided a decent quality of ride for only a small fraction of people and for a portion of their total trips. These experiments proved unsuccessful because they have not been able to capture a reasonable number of trips, due to the limited coverage, which made it unfeasible for an ordinary person to dispose of his personal transportation and rely on the mass transit systems." (797L)

These two studies therefore indicate that the chances of an urban area having a viable and effective public transport system are considerably reduced the smaller the urban area. On the one hand, it would hardly be economic to provide a comprehensive network service in a small urban area. On the other hand, a comprehensive service is necessary in order to attract (or retain a hold on) travellers who have an alternative mode available to them. One reason for declining ridership of transit services the world over is the deteriorating quality of these services. When it is no longer

possible to assure riders that a good fraction of their intra-urban travel demands can be comfortably satisfied with the mass transit system, they will, if they can, seek alternatives.

Economies of scale also apply in the sense that the larger transport planning area can afford to hire more highly skilled manpower and the recording and analysis hardware and software to go with them.

7.4.3.5 Agencies

This topic is another which has been frequently discussed over many years at conferences and seminars in many different contexts and in many different countries.

Transport planning can only be undertaken with the full co-operation of inter alia public transport operators and government. The place of monopolistic or near-monopolistic operation of public transport is the subject of much discussion.

Particularly this is so in respect of road public transport. Reporting a conference on the subject, Roth stated that even in the context of western countries, there was no unanimity among the experts as to what was the better system. One economist put forward the case for deregulation; jitneys and other forms of smaller bus or taxi would provide a competitive market and would be able to relieve the bus companies of expensive peak load operations. An academic took the opposite view: "He saw the provision of urban public transport as a technological problem and felt that only a regulated monopoly could provide the expertise and the equipment required to meet the needs of consumers." Another speaker pointed out that the western experience was not generally transferable elsewhere in the world; transport monopolies were the exception rather than the rule. "Most people in the world today depend for their routine travel needs on what American transportation planners would call 'paratransit' or 'public automobiles'." Another speaker described an experimental "brokerage" concept in public transport, whereby "the public authorities not only provide transport themselves, but take an active part in introducing potential users to other suppliers." (797M)

7.4.3.6 Location of responsibility

7.4.3.6.1 Introduction

"Major urban areas such as Metropolitan Toronto give rise to more, and more complex, transportation issues than do small communities. They serve as important origins and destinations for people and goods moving in the national and provincial transportation systems, and the smooth flow of all this traffic to, from, and within these areas is a constant concern of all levels of government. From the point of view of local government, however, appropriate policies and facilities for permitting efficient movement within urban areas are even more important. It is essential, therefore, that local government structures and processes for transportation planning, operations and finance be reviewed regularly and adjusted when necessary to contemporary circumstances." (797N)

7.4.3.6.2 Canada

The planning of road and transit facilities "providing mobility between all parts of the urban area and beyond" is in Metropolitan Toronto the responsibility of the Metro Council. This includes the transportation elements of the metropolitan plan. "The safe and efficient movement of people and goods by all modes of transport ... is the prime concern." However these modes of transport are actually furnished by the area municipalities, by Metro itself, by the Toronto Transit Commission, by provincial and federal agencies and by private endeavour, as is described in the next few paragraphs.

The Metro Council is responsible for the maintenance and construction where necessary of arterials and expressways. To regulate the movement of traffic the Metropolitan Road Traffic Department operates a unified traffic control system. (7970)

Robarts commented that the arrangement at the time for the planning, construction and maintenance of roads, which was a shared responsibility between the province, Metro and the area municipalities, was satisfactory. It "is a demonstration of the success of the Metropolitan system in satisfying area-wide and local needs. In the past ten years there have been some bitter

disputes over road proposals in Metropolitan Toronto, but the structural arrangements have been such that some solution has been possible, although not always to the complete satisfaction of all parties." (797P)

Parking had not "been considered an important element of the total transportation system, and little has been done to plan, co-ordinate, or control its provision. ... [However] since it is the Metropolitan Council that has responsibility for area-wide transportation planning, that body should have ultimate control over parking to ensure that this aspect of the transportation system contributes to the effectiveness of the whole. The most important step in securing this control is to make explicit provision for the inclusion of a parking policy in the Metropolitan official plan and related transportation policies." (797Q)

"The Toronto Transit Commission [TTC] operates all public transportation, with the exception of railways and taxis, within the 244 square mile Metropolitan Toronto area. The Commission is administered by five commissioners all of whom were appointed by Metropolitan Council." The operating loss of \$50 million for 1978 was recovered from the Municipality of Metropolitan Toronto. "Based on future operating expenditures, cost sharing for operating expenditures will be approximately TTC 60 per cent, Metropolitan Toronto 25 per cent, Province of Ontario 15 per cent." (797R) "The transit system [is] thus recognized to be an important public utility contributing to the general well-being of the total [metropolitan and surrounding areas] community, not merely a convenience to its riders." (797S)

The inter-regional transit service in Greater Toronto is co-ordinated by "a technical committee, Toronto Area Transit Planning Coordinating Committee, consisting of staff from all the Regions serviced by GO [Government of Ontario] Transit and from TATO [Toronto Area Transit Operating Authority, a Crown Agency established in 1974 to administer GO transit services] and the Ministry of Transportation and Communications." GO Transit is a rail commuter service operated for the province by the Canadian National Railways. (797T)

Robarts feared that there was potential for confusion in the duplication of effort between the Toronto Transit Commission and the Metropolitan Council. "Council must have and retain the clear responsibility for transportation planning. ... Only in this way can the necessary co-ordination of, and the effective accountability for, local services be achieved." (797U)

Note that the loss on operating the Transit Commission has only recently assumed its present proportion. "Until the late 1960s the Toronto Transit Commission was able to finance its operation from the farebox. ... the transit system was treated as a public utility: it provided a service at a price that was set to cover costs. The recognition of the value of public transit as a means of relieving congestion and as a tool for influencing physical development changed that orientation. ... transit has become a political matter of pursuing community objectives rather than the mere provision of a service at cost. And since the decisions are essentially political, they should be the responsibility of Metro Council. ... If those recommendations are implemented, Metro Council will have the authority to determine the level of transit service to be provided and the relative proportions of the cost to be met from fare revenues, from taxes and from grants." (797V)

7.4.3.6.3 United States

"Examples of government-transport interdependency in the United States extend to every market for transportation. In urban areas, public transit is generally under local government ownership and operation, financed in large part by the federal government, with assistance from the states." (797W)

This interdependency might be through direct involvement as a transport systems provider or operator, or indirectly through funding or the provision of infrastructure. For example, "the US Department of Transport has recently decided that every metropolitan area with a population of more than one million must submit a 'unified work program', to qualify for a transport grant. Such a programme will have to include 'long-term objectives as well as an annual project plan.'" (797X)

There is, however, a feeling that federal involvement in local transport projects has reached its feasible and desirable limit. For example, an interview with the Administrator of the Urban Mass Transportation Administration (UMTA) revealed that: "As far as funding goes, Lutz [the Administrator] feels that federal percentage shares have gone too far. He believes that the local (non-federal) government should 'have a piece of the action'. '... at what point does the non-federal percentage become so low that the guys don't look hard at a project? There is less incentive to maintain if your own bucks aren't in there.' ... As far as operating cost assistance, the administrator said in his view we need an assistance program, but that the federal government shouldn't be involved in making the local fare and service decisions. 'If the government is paying \$1 out of every \$2, there is going to be a lot of pressure for them to go in there and tell the locals how to run their buses.'" (797Y)

Los Angeles has a comprehensive freeway system, and in the circumstances it is perhaps difficult to visualise a sufficient volume of patrons being persuaded to support a major transit system. However, attempts, albeit unsuccessful as yet, have been made to organise a regional public transport agency. Orski referred to the "three phenomena - segmentation of interests, diffusion of decision-making powers, and waning public confidence in governmental institutions - [which] are bringing about vast changes in our society ... [and] are profoundly influencing the transportation sector." He gave an example of this. "A consequence of this segmentation is a growing inability of metropolitan areas to achieve consensus on area-wide transportation strategies. The case of Los Angeles, debating with itself since the early 1960s on the need for rapid transit and unable to come to a decision, is only an extreme example of the developing paralysis in metropolitan transportation decisionmaking. Similar indecision, vacillation and stalemate mark the political processes in a score of other cities." (797Z)

However, not all cities have experienced the transit paralysis which has bedevilled Los Angeles. For example, Washington has brought into operation an advanced transit system. Controversy about the system has been confined to technical aspects and to cost; the organisational aspects of the project's implementation have not been criticised. The Washington Metropolitan Area Authority is

responsible for Metrorail planning, construction and operation and for managing and operating the area's extensive bus system. (798A)

"Because of the inability to forge consensus at the metropolitan level, the states have been thrust into much more prominent decision-making roles in urban transportation. Only the state, goes the argument, can mediate urban/suburban conflicts, and only the state has a broad enough fiscal base to provide a stable, predictable source of transit deficit-financing. Moreover, state enabling legislation is required if localities are to undertake certain transportation-related activities, such as revenue bonding, tax-increment financing and various public incentives for private action. The presence of the state will loom ever more important as municipalities become more and more strapped for money." (798B)

Orski named several states that had begun tax-base sharing between central cities and suburbs, in order to encourage transit development. California has enacted a state-wide sales tax in support of public transportation. Counties are also assuming a growing importance in the provision of public transportation; they occupy "a uniquely advantageous position because their territory is generally large enough to encompass problems too big for local governments to handle, yet they represent a level of government that is still relatively 'close to the people'. A good example of the emerging influence of the county government in urban transportation are the county transportation commissions of Southern California, which are authorized to determine local policy for all federal and state highway and transit funds. ... urban counties could become the de facto metropolitan government of the future." (798C)

"There is a strong case for having metropolitan-wide transit financing arrangements. Fares will never approach levels necessary to support transit operations; few public transportation systems cover their operating expenses out of the farebox. Nor are the prevailing financing arrangements - whereby the transit authority annually passes the cup among various jurisdictions and levels of government - a satisfactory solution. Public transportation needs a secure, stable, and predictable source of revenue. This could mean region-wide taxes of one kind or another dedicated to transit purposes.

The logic of it would seem compelling. But this perception is not universally shared. Only a small number of metropolitan areas - Atlanta, Chicago, Cleveland, Denver, Kansas City, Houston, San Antonio, and San Francisco - have approved regional sales taxes earmarked specifically for transit purposes. The prospects for further regional transit financing referenda, in these post-Proposition 13 days, do not appear promising." (798D)

"Another consideration makes it difficult for MPOs [Metropolitan Planning Organizations] to exercise effective influence. It is the rising tide of sentiment for more grass-roots initiative and local control over planning and service delivery". (798E)

This parochial tendency is further evidenced by another quote (although the source intended the example to show the disadvantage that is necessarily associated with public ownership of an urban transport operation!) When Lutz resigned from his post of General Manager of the Washington Transport Authority, he "complained of the 'constant bickering' by the system's politically sensitive 12-member board of directors. 'I could understand it on big issues' he said, 'but they were torn on every issue, big or small. Even though a vote would be clearly in the best interests of the Authority, they would vote the best interests of their local governments'." (798F)

Johns was another who spoke in favour of the unified control of transport planning. The conditions which brought United States officials to the recognition of the need for unification of urban transportation management were inter alia: "A growing official recognition that overall community transportation desires and needs could not be met with a continuation of our fragmented approach, and that we could ill afford the waste of duplication and competition. Any examination of the various elements of transportation management programs shows that continuing to permit each of our agencies to practise its own art or science in a relative vacuum could be wasteful, and in some cases, monumentally so. Decisions to fund major new rail transit systems, for example, without full consideration of the potential service available from expanded bus transit services and preferential treatments for high occupancy vehicles, could lead to major mis-application of limited resources." (798G)

Quoting an example to illustrate his case, Johns claimed that the major obstacle to unification of transport programmes is lack of public support, or in many cases, actual opposition from groups of citizens who "can and often do become formidable opponents once they see and are affected by revised traffic plans." While recognising that there are many problems involved in such a strategy, Johns advocated that the professionals "must strive always to provide full information to the public, explain what the benefits are expected to be, ask the public for advice and support ... and expose the full range of available options including the cost of doing nothing." (798H)

Orski commented on transport planning, resource allocation and financing by special-purpose bodies as opposed to general-purpose government. "The roles of regional bodies are less clear. The only actor on the stage at the present time that can play a regional role is the Metropolitan Planning Organization (MPO). Yet, most will agree with a few outstanding exceptions, ... today's MPOs are not notably effective. ... Will the MPO gradually evolve into a body with an effective power to make decisions? ... Those who entertain secret hopes of seeing the MPO evolve into a true programming and resource allocating body ignore one crucial fact: the power to make things happen remains in the hands of general purpose government. ... Without the goodwill and co-operation of implementing agencies, MPOs will be nothing more than proverbial 'wishlists' of unfulfilled expectations." (798I)

7.4.3.6.4 Britain

Maud recommended strongly: "All aspects of transportation must be controlled by the metropolitan authority. Unified policy and execution are essential; and they must be in the hands of the authority responsible for planning. [Subject that is to delegation of powers to district authorities on an ad hoc basis.] ... We believe, however, that in the three new metropolitan areas it will be most economical in staff and most efficient in operation if responsibility for all roads is concentrated, with the rest of transportation, in the metropolitan authority. ... The metropolitan authorities for Merseyside, Selnece and the West Midlands (and the unitary authority for Tyneside) should take over responsibility for

passenger transport services from the passenger transport authorities established in these areas under the Transport Act 1968. ... We have been considering units to be administered as coherent wholes for all purposes of planning and transportation, and when local government is reorganised on the basis of such units they will provide the most appropriate areas for authorities in charge of passenger transport." (798J)

This advice was by and large followed in the reorganisation of local government in the early 1970s. "Metropolitan counties are passenger transport authorities: elsewhere this function is performed, if at all, by districts. However, all counties are responsible for promoting public transport policy in conjunction with bus operators and British Rail." (798K)

"In the metropolitan counties of Greater Manchester, Merseyside, West Midlands, Tyne and Wear, South Yorkshire and West Yorkshire [and in Greater Glasgow], the metropolitan county council, acting as the passenger transport authority (PTA), is responsible for local transport policy as a whole, and appoints a professional passenger transport executive (PTE) to be responsible for day-to-day management and operations. ... The PTEs operate bus services in their areas and are responsible for reaching agreements with other passenger transport operators in their areas, including the British Railways Board, concerning the provision of such services as are considered necessary by the PTAs. In London, the bus and Underground rail services are operated by the London Transport Executive which is responsible to the Greater London Council." (798L)

Other metropolitan rail services, including the underground systems in Glasgow and Liverpool, are operated by British Rail on behalf of the PTEs, except for the new system in Newcastle, which "is operated by the Tyne and Wear Passenger Transport Executive and is independent of British Rail." (798M)

It would appear that in general terms "the PTE had a degree of autonomy which no other local authority department could expect to achieve. ... The statutory relationships between metropolitan county councils which are the transportation authorities for their areas

and the public transport executives are unsatisfactory. We wish to see the PTEs merge into the county council structures." A spokesman for a PTE supported this, but pointed out that this would not be sufficient to ensure the desirable level of transport co-ordination, as the local services of both the National Bus Company (who "provide 60 per cent of the bus services") and British Rail will remain outside the "full control" proposed. (798N)

7.4.3.6.5 Australia

"In the three cities visited in Australia, transportation planning and operation is accepted as a State [i.e. equivalent to province in South Africa] function and is administered by a three man appointed Commission operating as a transport authority. This authority administers State funds for planning ... and the financing and implementation of schemes. This system has the advantage that the transportation facilities serving metropolitan areas are paid for by taxes obtained from the entire region the cities serve. It has the disadvantage that transportation is removed from the 'grass roots' level of government and that transportation planning and implementation tend to be independent of other State authorities, each being separately responsible for, for example, housing, planning, water supply and sewerage." Most of the cities in Australia are encouraging public transport and very few freeways have recently been constructed or are being contemplated for construction. (798O)

"In Sydney the Federal Government subsidises each bus traveller ... In Perth the Metropolitan Transport Trust operates all public transport modes. ... In Sydney ... the Public Transport Commission is responsible for carrying 80 per cent of the commuters to the CBD by public transport. ... The ... Metropolitan Transport Trust of Perth ... was instituted in 1962 to co-ordinate all transport systems in terms of an Act of the Western Australian State Parliament; it has complete authority and is directly responsible to the State Minister of Transport. The Trust has acquired all the individual bus companies operating in metropolitan Perth and co-ordinated them into one effective system in conjunction with ferry and rail services which are also under its control. Rail services are specifically operated for the Trust which determines overall policy." (798P)

7.4.3.6.6 South Africa

Early in 1972, the central government appointed a committee under the chairmanship of the then Secretary for Transport (Mr J Driessen) "to submit a report and make recommendations on -

- the problems affecting the planning and provision of adequate urban and metropolitan transport facilities in the Republic; and
- the manner in which expenditure on the provision of urban transport facilities should be financed, taking into account the current and expected economic and financial conditions in the Republic." (798Q)

This committee, already quoted in Section 7.4.3.1 above, interpreted its terms of reference to include -

- "the role that metropolitan, as opposed to municipal, authorities can play in the improvement of transport facilities and services; and
- the financing of urban transport services and facilities on a sound basis and in accordance with principles which will promote the economic progress of the country in the immediate as well as the more distant future." (798R)

Driessen described the type of administrative machinery required to implement the proposals. The roles of the core city and the provincial government were highlighted. "The core city should, in the view of the Committee, play a key role in the preparation, and more especially the implementation, of urban transport plans on account of ... the expertise on urban transport problems which has already been accumulated by the core city. ... The Provincial Administrations must necessarily play a strategic role in the proposed arrangements by virtue of their close ties with local authorities, their responsibility for the provision of roads outside municipal boundaries, and their involvement in regional and urban planning." (798S)

Following a White Paper and various further studies, legislation was passed in 1977. (798T) The Act made provision for the declaration of metropolitan transport areas and for the designation of a core city for each area. The core city has the responsibility for preparing a metropolitan transport plan for the area; this it must do in collaboration with other selected organisations.

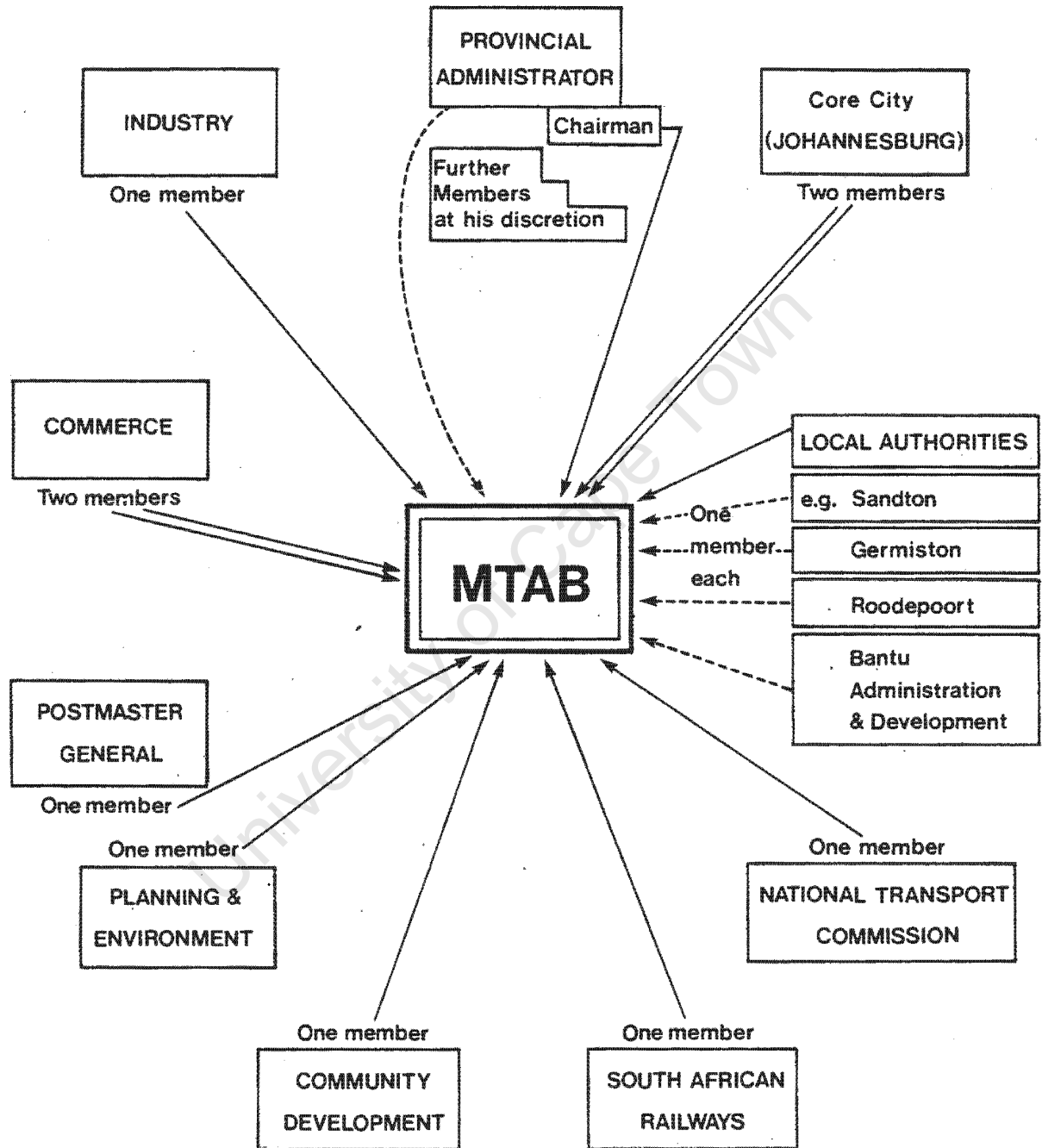
"The transport plan will be an evolving creation consisting of numerous documents and plans. As it evolves it will have, firstly, to receive the approval of the Metropolitan Transport Advisory Board (MTAB) which will be under the chairmanship of an official of the respective provincial administration. The board will comprise of representatives of various government and quasi-government bodies, local authorities, organised commerce and industry and persons with special knowledge. ... [Figure 7.4.3.6.6A.] From the Board the various components of the transport plan will pass to the Administrator and if it receives his approval it will come before the National Transport Commission for consideration. Figure 2 [Figure 7.4.3.6.6B] illustrates this procedure." (798W)

"A very real function of the Metropolitan Transport Boards will be to motivate the economic justification for the proposals contained in their transport plans [so as] to attain the degree of help Local Authorities maintain they require." (798X)

As far as public transport operation is concerned, in South Africa at present urban rail services are the responsibility of the S A Transport Services (SATS, formerly SAR), while urban bus services are provided by a variety of public and private enterprises. The major private operators are the City Tramways group, which serves all races in the GCT and Port Elizabeth areas, and Putco. The other major municipalities (including Johannesburg, Pretoria and Durban) operate extensive bus services the losses on which are charged to rates; in the first two named, however, these are for White commuters only. "Only nine towns and cities have municipal transport undertakings; all show a loss on the service. Most bus services operated by private undertakings require substantial subsidies on passenger fares. Losses vary, the average loss being R12 000 per bus per annum. For a large local authority, this can amount to R1,0 000 000 per annum." (798Y)

Subsidies are only granted to bus operators after the central government has carefully investigated the economic justification for aid. Some of the subsidies are paid from the Consolidated Revenue Fund, from which source railway passengers are subsidised at an even greater rate than are the bus passengers. Others are paid from a Transport Levy Fund, administered by the government and funded by

FIGURE 7.4.3.6.6A
COMPOSITION OF A METROPOLITAN TRANSPORT ADVISORY BOARD (1980)



commercial and industrial employers to help pay for the transport of their employees.

Discontent with fare levels has been volubly expressed, especially in the last few years in GCT. A commission of inquiry, headed by Dr P J Welgemoed, was in 1981 appointed to look into bus passenger transport, increasing operating costs, the need and desirability of subsidies, and rising fares. The Commission had, at the time of writing, not yet reported.

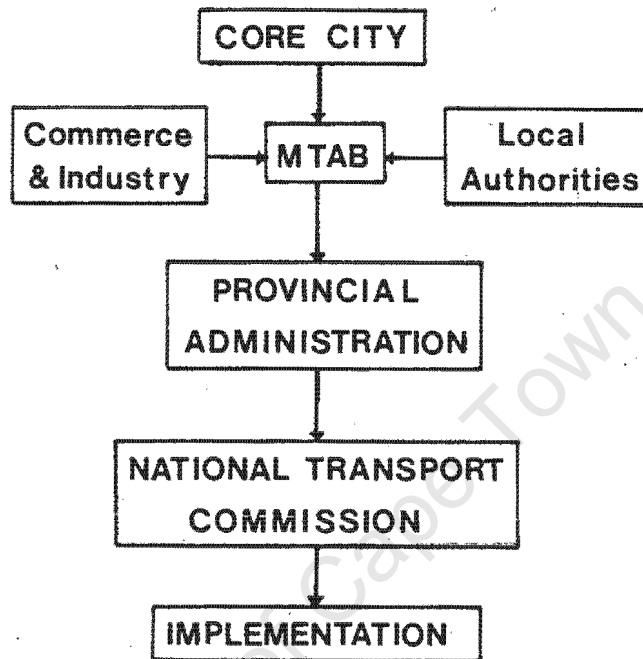
A topic of particular interest is the responsibility for operation of these bus services.

"Many authorities believe that bus services should be run by one organisation which is given special privileges and obligations. The privileges include protection from competition and the obligations generally require the operator to provide both profitable and unprofitable services. To maintain the latter, greater and greater subsidies are required from public funds." (798Z)

The Marais Commission recommended the granting of monopolistic or quasi-monopolistic rights in respect of public road passenger transport "wherever this will contribute substantially to the economies inherent in large-scale enterprises." But the Commission also recommended that "in such instances the principle of countervailing powers be maintained and that therefore the operators concerned should preferably be independent organisations - whether profit or non-profit earning - and not be the local authorities." (799A)

The general manager of Putco has stated that present regulations which in the Witwatersrand area prohibit bus operators from picking up passengers outside their specific areas cause fuel to be wasted. The rationalisation of services, private and municipal, would resolve this situation. (799B)

FIGURE 7.4.3.6.6B
 FLOW CHART FOR APPROVAL OF A TRANSPORT PLAN
 (798V)



A South African study of the greatest interest to this thesis is that by Morton. This study, "critically examined the existing public transport structure in the metropolitan areas, studied the relevant legislation and examined overseas co-ordination methods either physically or by literature searches." (799C) His conclusions can be summarised -

- all modes of public passenger transport within a metropolitan area must have a uniform fare structure, co-ordinated timetables, transferability and convenient interchange;
- uniform ownership is not necessary, but uniform control is; and
- "it is most unlikely that full co-ordination of public transport in metropolitan areas can be achieved on a purely voluntary basis." (799D)

The crux of Morton's recommendations reads as follows: "In each metropolitan transport area there should be established a passenger transport corporation (PTC), separate and apart from existing

government bodies, but under the supervision of the National Transport Commission in terms of The Urban Transport Act 1977 and subject to control by the appropriate Local Road Transportation Board as required by The Road Transportation Act 1977.

The Corporation should have adequate powers to plan and implement a co-ordinated multi-modal passenger transport system in the Metropolitan Transport Area concerned. It is envisaged that the Corporation would function at three levels: a Board of Directors responsible for policy, an Executive responsible for planning and managing the total system, and the actual operation of the system by the incorporation of former municipal transport departments and by operating agreements with private bus undertakings and the South African Railways Administration." (799E)

Most of the members of the Board would be local authority representatives. Apparently no representation would necessarily be given at this level to the major private bus companies, where these operate. This is despite their proven expertise in bus operation management and Morton's own conclusion that the Board members needed to "have wide experience of passenger transport." (799F) Private enterprise "can play a role in metropolitan public transport but at the operational rather than the planning level." (799G)

The annexure to the report of the President's Council listed "transport" among those services in respect of which "there are clear potential economies in providing ... on a regional basis in the large centres. ... Co-ordinated planning and development of the service infrastructure must go hand in hand with land use planning. The suggestion of independent Public Transport Authorities in major centres found favour. This could well be a separate authority in metropolitan regions, not related to any metropolitan authority created to provide engineering services. The ideal solution may vary from centre to centre and could depend on the source of finance available to any metropolitan body." (799H)

However the City Tramways house magazine Tollgate, disagreeing, commented as follows: "Co-ordination of urban transport is desperately needed, especially in cities which do not enjoy the high degree of co-ordination achieved many years ago in both Cape Town

and Port Elizabeth. The unified control of bus operation throughout these two entire metropolitan areas could hardly work more closely with the SAR's own unified control of the trains. The Metropolitan Transport Advisory Boards (MTAB), already proliferating with specialist committees, one solely concerned with public transport, are handling the provision of roadways, traffic priorities and better station interchange. Morton discards MTAB, together with other existing authorities, as inappropriate for controlling the operation of urban public transport. We need, he concludes, what are effectively British-style PTEs." (799I)

It is easy to agree with Tollgate in this instance. Unless the proposed PTCs and Public Transport Authorities were to be under the control of the MTABs, the presence of an independent metropolitan transport body would be likely to increase present problems of inter-authority service provision within South African metropolitan areas.

7.4.3.6.7 Other countries

A study of eleven metropolitan areas in very different parts of the world was made by the United Nations in 1970. "Mass public transport has been subject to regionalization of urban administration more consistently than any other service. It is also more frequently provided by public enterprises and special authorities than by central government departments. On the whole, however, mass transport administration is the most functionally fragmented of urban services. Highway authorities, traffic authorities, bus and tram companies, ferry services, railways and rail transit systems abound usually with minimal relationship and little planning." The study found that a variety of approaches existed to organising metropolitan transport systems (that is, when any attempt was made to organise). "In addition to extra-territorial services of city agencies (which have limitations, particularly if a deficit is incurred), there are metropolitan transport authorities that are (a) independent, (b) wholly controlled by high levels of government, (c) owned or supervised by general metropolitan government, (d) managed by intergovernmental boards representing all tiers, and (e) controlled by metropolitan associations of local authorities."

Only Paris, Stockholm and Toronto, of the cities studied by the United Nations, had in the previous decade (i.e. the 1960s) undertaken comprehensive transport planning efforts. The benefits of this planning were clearly shown in the more reliable and comprehensive standard of service and the more satisfactory financing arrangements. For example, "in Paris, the regional transport authority operates metro [i.e. underground rail] services in the city and bus services throughout the urban area. ... Its governing board includes representatives of local councils, central ministries, and employee groups. Its deficit is shared by several levels of government and it is supervised by a national ministry with the aid of an intergovernmental committee. ... The city-owned transport company in Stockholm, together with suburban bus services, is gradually being taken over by a regional transport association of local authorities, which will be responsible for all public transit services in the urban area."

The study concluded "that the issue of administrative scale (in these cases metropolitan) and the issue of level of government control are separable." (799J)

7.4.3.7 Conclusions

Traffic is a function of activities, and traffic is concentrated in cities because activities are concentrated there. In seeking to ease congestion in the cities, care must be taken not to harm their productive functions. Accessibility is the primary aim, whereas mobility is only a means to an end. Sound land use planning to reduce the need for travel if possible is a most desirable tool; all studies stress the importance of the optimisation of the advantages of urban living.

The case for regional transport planning is very capably demonstrated by all the examples quoted above. Not only are there economies of scale generally available to be exploited but it is so that urban transport planning cannot be applied successfully in isolation. It must be integrated with the planning of inter alia housing, places of employment, environment, and land use generally. Before any worthwhile planning can be done, clarity should be obtained about the goals to be pursued for the metropolitan area in question.

Transport routes and employment opportunities transcend traditional local authority boundaries. Consequently, comprehensive planning and action must be taken on the metropolitan scale. There is complete interdependence between the various local authorities, businesses and people within each metropolitan region. Whereas local autonomy in some fields is to be desired, a metropolitan approach to transport planning is clearly necessary. This is generally agreed, the literature survey reveals.

However there is far less unanimity and agreement on principles and conclusions in respect of the operation of transport within the metropolitan transport planning framework. Particularly whether it is necessary, provided co-ordination is achieved at the metropolitan level, for actual operation of public transport to be under unified day-to-day control. The advantages of co-ordination are clear but there is no unequivocal evidence that there could not be room in a large metropolitan area for more than one operator of, for example, the bus service.

It is almost universally recognised that central and provincial government have to get involved in metropolitan transport, if only because of the inadequacy of local and metropolitan financial resources.

In most of the above, examples quoted relate to people transport. However where the general term "transport" is used, reference to goods transport is included. Further, it should not be forgotten that a synoptic view of urban transport must include air, water, pipeline, conveyor etc. forms were applicable. For the transport system to yield optimum service these various modes must be co-ordinated.

8

THE SERVICES INVESTIGATION : ALL SERVICES AND ALL CRITERIA

University of Cape Town

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Chapter objective

The objective of this chapter is to discuss and illustrate the assembly of evidence, on the topic of rationalisation of organisational forms for local authority services provision, from a wider viewpoint than that to which Chapter 7 is confined. Rather than viewing each service individually, the multiservice perspective is taken. Furthermore, rather than confining the assessment to the single criterion of efficiency and effectiveness, the viewpoint is widened to include the other relevant criteria.

8.1 THE LITERATURE SURVEY : GENERAL

8.1.1 OVERVIEW OF THE CHAPTER

In the opening chapters of this thesis, organisational relationships between authorities are discussed from a general viewpoint. The relationships include the formal allocation of responsibilities in respect of control and communication, finance and the performance of the various functions. It is stated, in terms of the methodology set out in Chapter 6, that a prerequisite to the meaningful assessment of the organisational relationships is a more specific analysis of the performance of urban services.

In Chapter 7, services are viewed individually and in terms of a single criterion. However, as Chapter 5 stresses, the provision of services requires a systems perspective. In Chapter 8, therefore, a multiservice multicriterion viewpoint is taken.

As in respect of the needs of Chapter 7, the necessary information on the topic of local authority services rationalisation is gleaned from a literature survey of descriptions of various parts of the world. This literature survey excludes for the moment studies specific to the area chosen for the case study (i.e. Greater Cape Town in the present instance).

The methodology of investigation demands that the same pre-selection must take place as that described in Section 7.2 above of the country and literature set which is thought to, be most appropriate and convenient to the needs of the metropolitan area being investigated.

In this chapter, Section 8.2 deals with the all-services spectrum, and then Section 8.3 widens the discussion, hitherto on a basis of the efficiency and effectiveness criterion only, to include all relevant criteria. Section 8.4 draws conclusions.

8.1.2 COMPLEXITIES : FORM FOLLOWS FUNCTION

Reorganisation of the provision of services is a topic which in most metropolitan areas has periodically been aired. Different opinions are heard especially on whether the incorporation of smaller authorities into a single authority will facilitate efficiency and effectiveness.

As cities began to spread into large metropolitan aggregations, a phenomenon which became noticeable particularly in the early 1950s, the fragmented nature of responsibilities in these areas began to be cited as a major cause of services problems. "Stressing the interdependence of governmental units in metropolitan areas, reformers argued that 'economy and efficiency' could be enhanced through the consolidation of local governments. Prior to 1930, cities had been able to keep abreast of growth through annexation. However, after World War 2 cities met increasing resistance to annexation; satellite communities, with their own governments, began to proliferate on the fringes of cities. ... The metropolitan governmental reorganization movement seemed to reach its peak in the 1950s ... almost invariably [its] surveys found duplications and fragmentation and recommended various structural reforms, often consolidation of governments, as ways of obtaining economies of scale in service delivery systems and enhancing 'economy and efficiency'.

More recently, those arguing for enlarged jurisdictions in metropolitan areas and proponents for regional government have cited fragmentation and the 'local government jungle' as sources of 'crises' in municipal service delivery systems. ... 'The bewildering multiplicity of small, piecemeal, duplicative, overlapping local jurisdictions cannot cope with the staggering difficulties encountered in managing more than urban affairs. ... If local governments are to function effectively in metropolitan areas, they must have sufficient size and authority to plan, administer, and provide significant financial support for solutions to area-wide problems.'" (801)

However numerous investigators have in the last two decades argued against increasing the size of jurisdictions. They claim that there

is in respect of most services little evidence that efficiency improves significantly as the scale increases. In fact, the contention is that there are often diseconomies of scale in service provision.

Recalling the description earlier in this thesis (Section 2.2) of the spectrum of alternative local authorities, from "integrated" to "polycentric", it is as well to debate in the abstract at this point further relative merits and demerits of each type. "Integrated" can for the purposes of this discussion be equated with centralisation or consolidation of authority. Similarly, "polycentric" can be equated to decentralisation of authority and dispersal of resources.

"Centralization" refers to assigning authority and accountability to a more senior organizational level. Decentralization, correspondingly, means placing these at a 'lower' organizational level. We use 'consolidation' to describe the physical bringing together of staff or equipment resources in a central location. Conversely, the spreading out of these to more [distant] physical locations is termed 'dispersal'". (802)

"Centralization and consolidation allow an entity to capitalize upon specialization in employee skills, management, equipment and technology. They may lead to higher output from employees and better utilization of facilities, and eliminate the duplication inherent in having many smaller units. These can give a better quality of service, one that is more responsive because it is more specialized, applies opportunities for standardization and brings a broader perspective to the needs. This in turn can lead to economies of scale, with fewer employees, managers and overhead.

Decentralization and dispersion, on the other hand, have their own set of advantages. They give support to the principle of local accountability: authority is closer to the point of action, and local control is kept over services and costs. This should bring higher productivity: local initiative and innovation are encouraged, the employees are closer to those who use their services, communications are faster, and employee morale and job satisfaction are higher. The quality of services may be better, too, since services based on a better knowledge of the local

situation may be more responsive to local needs. The number of employees, and therefore the costs, may be lower, because staffing and the standard of service are directly related to local needs and priorities." (803)

It will be apparent that some of the same benefits are claimed for both centralisation/integrated authority and decentralisation/polycentric authority. "For example, a higher quality of response to service needs is used as an argument in favour of either. Fewer employees and lower costs are cited as advantages of both. Most of the advantages either way are intangible, and difficult to prove either before or after the fact. The issues are laden with emotions and coloured by personal attitudes." (804) A municipal official at a local tier may believe that local autonomy and control must be preserved in order to maintain local accountability to the public. On the other hand, a municipal official at a regional tier may feel, equally sincerely, that an integrated and centralised form fosters consistency, breadth and higher quality of service.

"Yet a balance between the poles must be maintained. Indeed, the essence of our democratic and our political processes is the existence of such checks and balances. These should ensure an appropriate blending of local knowledge and broader perspectives." (805)

It is for most services and most circumstances possible to identify, as is exemplified by the approach of Chapter 7 above, a set of guidelines for improvements to be made to the organisation of services provision. However, as pointed out in Chapter 5, the needs of each service differ, and the services provision system has to be looked at as a whole. Advantages have to be substantial and, if not beyond dispute, then at least sufficiently convincing to the decision-makers to justify the effort of adapting or remodelling the structures that are at present responsible for provision of the pertinent services.

One of the key factors in any study is the cost function behaviour in the theory of production of the services. Consideration of this is bound up inextricably with centralisation of structure and consolidation of human and physical resources. At what size can

economies of scale be maximised? At what point is the efficiency stemming from operating at the larger scale outweighed by intangible but very important service and human relations considerations?

Note also that "centralization and consolidation are seldom absolute. There can be many variations and gradations. For a particular function, equipment-related activities might be centralized or consolidated, while people-related tasks are decentralized or dispersed. It is quite possible to consolidate work without centralizing it; logic may indicate that work for several autonomous units should be brought together in one place, while the authority over it is shared jointly by the serviced entities." (806)

In proceeding with the application of the methodology, set out in this thesis, to any area, such theoretical considerations must be kept constantly in mind. (See particularly Section 8.4.1.) But primarily it is necessary to endeavour to look realistically at the actual problems, needs, plans and opportunities within the metropolitan area under investigation.

Selecting the best organisational structure and allocation of responsibility comes near the end of this type of study, not at the beginning. The designing of the structure must follow a clear definition of the mechanism for determining need, of the needs themselves, of the work to be done and of the resources required to do it - not the other way around. "Form follows function." The structure must not be the tail that wags the dog.

The essential question which the application of the methodology must raise is thus: will changes in the allocation of authority and responsibility produce worthwhile economies and other benefits while at the same time maintaining or enhancing the quality of the services?

8.2 THE LITERATURE SURVEY : ALL SERVICES

8.2.1 INTRODUCTION

All governmental tiers are involved in some way or another in the

provision of urban services. In all of the cities studied in this thesis, central government policies, especially those involving fiscal programmes and priorities, exert a strong influence on the organisational responses to urban problems on the part of lower tiers. The magnitude and rapidity of growth of the need for urban services and the financial position of the authorities concerned, also affect the quality of response from the public agencies involved. It should be noted that the growth referred to is affected both by the physical growth in size of the population and/or the urban area and also by the growth in the expectations of the populace in their demand for urban services.

Institutions created to deal with specific urban services varied considerably among the cities studied. The area-wide expansion of the need for a service and a recognition of its regional character frequently generate proposals for the creation of an independent metropolitan authority to administer it. The arguments for this form of organisation usually include stabilisation of finances, protection of the service from external pressures and simplification of administrative processes. As a rule, however, the creation of autonomous service authorities leads to problems of inter-service co-ordination. Also, citizen groups are sometimes disinclined to accept bodies which are free from popular control, since this may mean that they will be insensitive to local demand.

The fact that many urban services require action on a regional scale has prompted local authorities to search for regional arrangements. The need to share the burden of the cost of urban services has also tended to prompt local authorities to co-operate and co-ordinate their actions with other governmental entities. The difficulties, including the delays and costs involved, of administering technical services from the national capital have led in some instances either to the creation of new regional units of administration or to the devolution of powers to local or intermediate authorities.

In almost all the cities studied, the present supply of services is inadequate to meet the demand. This is not surprising, in that in even the best organised of situations it has been found that the expressed demand constantly outstrips supply, however rapidly that supply may rise, as citizen expectations have a habit of becoming

more and more ambitious as previously expressed demand is satisfied. However in many cases it is perhaps not so much the gap between supply and demand which prompts suggestions of organisational change, but the perception or mere belief that improved absolute supply of services will be met by some reorganisation of institutions. The studies of the services covered in Section 8.2 indicate that such changes and improvements are more likely to occur in certain fields of service than in others.

Section 8.2 summarises the findings of selected reports on local authority services especially where they give evidence of the size of authority necessary for effective execution of the service. Whereas Chapter 7 describes the published findings related to a selection from the range of specific services, Section 8.2 aims rather to cover the published reports which are not specific to any of the services. Legislation arising out of the recommendations of these reports is mentioned.

8.2.2 TRENDS REVEALED BY THE LITERATURE

The literature survey reveals that the nature and emphasis of the approaches vary greatly between studies.

There are interesting general historical trends which can be observed in the published reports, if they are taken in chronological order. The reports dating from the 1950s generally tend to be more explicit on the recommendations of size of area to be covered by any particular service. There was a lot of speculation at the time on the deficiencies of small local authorities. This recommendation for larger units of administration was particularly the case for those functions associated with planning: transport, highways, housing and major redevelopment. Problems in these fields were seen to transcend then existing local authority boundaries. The demand for specialist staffs and for speed of execution of projects would, it was thought, also be met more readily with larger areas. Larger units were, on the grounds of efficiency, suggested for education, sewerage, water, refuse disposal, library and police services. (This does not mean that the sizes recommended for each service were of the same order. At the one extreme, the Steering Committee of the Buchanan Report

recommended ad hoc development agencies on an urban-region scale; at the other, a British committee on libraries suggested minimum units of 30 000 population.) A few reports recommended smaller local authorities but these suggestions were confined to the personal social services, such as health, welfare, certain aspects of education and housing. In these services the demands for co-ordination and the need for personal contact were seen to place limits on size.

Over the next decade, the emphasis changed to a certain extent.

The principal features of the 1970s studies, the literature survey shows, are -

- a reaffirmation of the benefits of a multiservice metropolitan authority responsible for selected services;
- as a part of the generally increased interest in and demand for more direct participation in matters affecting the local community, a reaffirmation of the merits of the small scale of operation in respect of selected services; and
- a greater reluctance to identify precise sizes, such as of services efficiency optima.

8.2.3 THE AREAL SUBDIVISION OF POWERS AND RESPONSIBILITIES : GENERAL GUIDELINES

A decision on the establishment of guidelines for the areal subdivision of power needs to cover two aspects. The first is the definition of the jurisdictional limits; this goes hand in glove with the second, viz the allocation of powers to the authorities which are defined.

Policymakers sometimes excuse their failure to formulate an adequate metropolitan policy by pointing despairingly to the difficulty of defining objectively the metropolitan area and the jurisdictional subdivisions thereof. Since every jurisdictional definition is, of necessity, bound to a purpose derived from a national delineation of problems and goals, the definition should generally be more mindful of what is socially valuable and politically significant than of scientific accuracy.

It is usually maintained that, all other factors being equal, the jurisdictional regions are best defined to be congruent in space with the functions to be carried out by the agency for which the jurisdictional limit is being defined. A water supply region will consequently inevitably be different to one for traffic control. The single-purpose agency is a device frequently resorted to, in many cities of the world, for a limited number of activities.

However, a multiplicity of independent single-purpose agencies, each with a different jurisdiction, is, because of the systems nature of services provision, in principle clearly not a tenable option. Therefore, the attempt must be made to deduce guidelines for the delineation of the multipurpose authorities. The option of special-purpose agencies, with different jurisdictional areas, must for the moment be left open for further consideration in respect of the provision of services which are particularly difficult to fit into the form of general authority suitable, with a bit of give and take, for most other services. For example water supply and the encouragement of employment opportunity are activities in which a strategy which extends beyond the urban limits of a metropolitan area may be necessary. Nevertheless provision of these can perhaps best be achieved by extension of the limits of the general-purpose authority rather than by creation of a new single-purpose authority. Single-purpose agencies must, in the interests of co-ordination, be kept to a minimum.

The search for a composite region to serve as a framework for metropolitan action must therefore be pursued. This effort may lead to contradictions between the requirements of planning and those of administration, and to contradictions among various functional requirements, but there is no reasonable alternative.

To compound the problem further, it is worth pointing out that the reformer never has the fortune to start with a clean slate. The metropolitan region must be one in which effective action can be taken. Definition of its boundary will therefore inevitably have to compromise in order to coincide, at least in part, with existing spatial definitions of authority, such as municipalities, provinces, boundaries of service agencies, etc. It must also be one for which information is available, and, since data are normally tabulated

according to the traditional governmental divisions of space, the planning region is seldom drawn freely over a map, but is rather composed of predefined building blocks. Except in cases where the function is very narrowly defined, experience has shown the wisdom of emphasising effectiveness over scholarly nicety and informational precision in the defining of a region.

8.2.4 THE LITERATURE SURVEY : A SELECTION

8.2.4.1 Choice

Once again the survey is largely confined to the handful of major cities which are selected above as the most suitable for assisting fulfilment of the terms of reference of the thesis.

There is not space in this thesis to more than summarise the evidence which is available on the subject. For a much more comprehensive description, the reader is referred to the City Engineer's report. (807)

In that report, the literature on the subject was surveyed by country. Particularly, studies were described of how it has been advocated in various instances that organisational forms for metropolitan services provision should be changed. (The reasoning behind these is of great value, especially if it is related to evidence of cost functions or to the realisation of community values of some sort. This reasoning was, where available, recorded.) Not only were change-motivating studies surveyed, but other studies were reported which recommended "no change". Particular attention was given to descriptions of the grouping of like services and to evidence on the presence of externalities. Each description was concluded, if this information was available, with descriptions of problems which arose after changes were made; suggested further changes, if any, were reported.

8.2.4.2 The literature survey of all services : summary

8.2.4.2.1 Introduction

The services should not be viewed each in isolation. Links exist

between them. The operation of each has externalities which affect other services.

8.2.4.2.2 Need for a regional approach

There is a growing awareness of the need for a regional approach in the provision of some urban services. This has been prompted, inter alia, by the following factors -

- the apparent, in many cases objectively judged and in others only subjectively judged, economies of consolidated action, (e.g. economies of scale, and of contiguity);
- the need to share the burden of the costs of services with other local and higher authorities; the need to charge as far as possible all the beneficiaries of a service a proportion of the costs of providing that service, even if some of these beneficiaries are not ratepayers of the providing local authority; and
- the need to eliminate externalities which are a characteristic of uneven application of or neglect of services in portions of a continuous urbanised area.

There is a generally accepted recognition that fragmentation of local responsibility for services provision in most metropolitan areas can be improved by a more rational organisation of the local authorities. Of course proposals must be tailor-made for the unique circumstances of each metropolitan area.

Several of the references in the literature survey stressed that, while a strong case can be made out in respect of certain services for the viewpoint that economies of scale exist, in many instances the case for largeness in public services probably rests as much on quality as it does on cost. This is sometimes disputed however. (See Section 8.2.4.2.3.)

Maud nevertheless pointed out in the following terms two factors favouring larger local authorities in metropolitan areas. Prior to the 1974 local government reorganisation, a major problem was that "no single authority is responsible for thinking about the totality of related services and their adequacy for local needs; no single authority is responsible for considering the community as a whole."

(808) Secondly, "many local authorities ... are too small in terms of area, population and resources, including highly qualified manpower and technical equipment." ... Local government ... cannot solve [problems] even though it has the responsibility for doing so. ... The importance of concentrating staff and resources in authorities able to use them to best advantage figured prominently among the reasons given in the evidence for basing the new local government system on units of a much larger minimum size than has hitherto been regarded as necessary." (809)

There was a strong feeling, in the literature survey reports from those areas which did not at the time have metropolitan authorities, that the establishment of a strong and effective metropolitan organisation could lead to a devolution downwards of a limited number of selected functions from the national or provincial tier.

Most of the overseas reports advocated suitable combinations of services for these proposed larger local authorities. It was generally agreed that planning and transportation should be administered together. Other reporters considered that large-scale urban renewal and housing, or at least the planning and construction of very large housing projects, should be in the same hands as planning and transportation. Further references pointed to the importance of the ties joining housing, health and welfare, child care and education. One committee drew attention to the close relation between the demands made on the social services and the quality of the physical environment. Another relationship much referred to in the evidence was that of water supply, sewerage and wastewater disposal and reclamation to each other in the first instance and in the second instance to the planning of new development and to the health services. The connection between clean air and public health on the one hand and planned measures to improve the environment on the other were also frequently referred to.

But planning is concerned not only with land-use choices or questions of physical development. "It is an instrument for satisfying people's personal and social needs. Because of their interaction on each other, the social environment and the physical environment in which people lead their lives must be planned

together. ... The major groups of local government services are intimately related to each other and [therefore] these services are likely to be best provided, both individually and collectively, if the organisation of local government reflects this fact. ... Surveying the full extent of local authorities' work, the Ministry of Housing and Local Government emphasised the advantages to be derived from bringing all major services in each area under the control of one authority." (810)

Maud stated that, ideally, the authority which would solve most problems would be that which, for any person or family unit, included home, work, schools and other frequently visited places within its geographical boundaries. (811)

In short, there is much to be said for the all-purpose authority. A single authority has the great advantage that it can relate its programmes for all services to coherent objectives for the future progress of its whole area. "It is the local government of its area. There is no doubt where responsibility lies, no confusion over which authority does what." (812)

Immediately, however, the question arises as to whether the ideal state sketched in the previous paragraph is in fact attainable. Would this not lead to authorities which are simply too large and unwieldy? Although the areas in question may be suitable in terms of efficiency and relation to the community and to its financial resources in respect of some services or facets of services, might they not be too big, unmanageable and uneconomic for other services? How would they relate to the need for community participation and identification within and with the authority which resulted? What managerial problems would arise from the size and complexity of the organisation which resulted? Would it not perhaps occur that the local authority departments would become so large and powerful that co-ordination between the departments became just as difficult a task as co-ordination between the separate authorities which existed previously?

It is not possible to consider this matter in the general case, but only in the circumstances of a specific area.

8.2.4.2.3 Disputing stated advantages of larger local authorities

Wood recalled that initial optimism was generated that the Maud Commission would be able to "prove" things. There was therefore a certain amount of disappointment that the Commission was often not able to illustrate any clear and necessary correlation between size and efficiency in the performance of local authority services. The Commission did make attempts to draw this correlation, but discovered that many of the services did not lend themselves to this sort of analysis and that natural science analogies did not usually apply. Therefore the Commission had to fall back in many instances on value judgements; critics made much of this "failure". (813)

To complicate matters further, Wood pointed out that the use of population as the independent variable in any efficiency versus size analysis is often unsatisfactory. Population alone is a very crude measure, because it masks very large differences in both resources and case-loads. Wood quoted as an example the futility of comparing per capita statistics on health services between two large towns with similar total populations, the one having 22 per cent of school age and five per cent pensioners, with the other having 31 per cent pensioners and only 10 per cent school age. He quoted another two examples where, for very good reasons nothing to do with efficiency, towns of the same population yielded assessment rates revenue which differed by 60 per cent of the lower figure. (814)

"Constrained by history and tradition, by the nature of the evidence, by concurrent developments, and by what little research there had previously been on the question of size, the commissioners embarked on a close study of the population requirements of the various services. ... The problems facing those who undertook studies of the relation between size and performance were immense. Statistics could frequently be interpreted in several ways (for example, do low unit costs per visit of a child care officer indicate efficiency, undesirably short visits, a lack of trained and highly paid staff, or what?) In particular it was exceedingly difficult to measure quality of performance. The inputs (visits, books, expenditures) were normally measureable, the outputs were intangible in the case especially of services where quality depends on personal communication (teaching, social work)." (815)

Most of the research documents surveyed were in agreement that the larger local authorities were able and in fact did provide a wider range of services, generally of higher quality. This, it was generally agreed, went a long way towards explaining the higher costs per head (or per other independent variable) encountered in most larger local authorities.

For example, Browne concluded "there can be no doubt that the 'need' for the general services of local authorities is satisfied to a greater extent as the size of the authority increases." (816) Thompson agreed, and pointed out that economies of scale in larger local authorities may be offset by the performance of more sub-functions under any particular service. (817)

However, Hutcheson and Prather disputed that the larger size of local authority necessarily inferred better services. They, in a study of American cities, investigated the two reasons given by advocates of larger local authority units for the generally higher costs per capita in those larger units. The first reason usually stated is that the larger cities generally tend to have more old age persons, more persons of foreign stock, more low income families and a generally wider range of social and engineering problems; hence, the reasoning goes, they carry inevitably higher costs. Secondly, the advocates of larger authorities state, the range and quality of services provided in the larger units is superior. For example, a larger authority's mechanical plant pool can not only offer lower unit cost of operation but also the availability of a wider variety of specialised equipment.

Hutcheson and Prather found that there was no correlation between the "extraspecial problems encountered by larger cities and the input required to maintain services in larger cities." In other words, the plea that larger cities had greater problems was not statistically borne out as a valid reason for the higher cost structure. Secondly, the survey by Hutcheson and Prather of expressed satisfaction by citizens of local authorities of various sizes did not reveal that a greater input of local authority effort necessarily produced higher-quality services. (818)

However no account was apparently taken of the essential difference

between characteristics attributable to large urban areas and those attributable to large authorities. The dissatisfaction reported to Hutcheson and Prather quite likely arose from the sheer size of the urban area and not from the size of the authority. Seeing as the larger local authority is normally associated with the larger urbanised area, it would in a study of this type be essential to separate the effects of -

- the size of urbanised area and
- the size of local authority.

These two, in most urbanised areas, would probably increase together, but this increase would disguise a number of important differences.

The point is, in a larger urban area would a series of smaller local authorities perform the services any more efficiently and any more satisfactorily than larger authorities would? It is essential not to confuse data on inefficiency in larger authorities with inefficiency of larger urban areas; the inefficiencies which Hutcheson and Prather apparently mistakenly report as inefficiencies of larger authorities are very likely problems which smaller authorities would only compound.

Attention is often given in the literature to what Richardson has termed "the optimal city size myth". "The idea is based upon a comparison of hypothetical cost and benefit curves with city size (population) measured on the horizontal axis.

Adopting the common assumption (and it is only an assumption) of an S-shaped benefit curve and a U-shaped cost curve, it follows that net benefits will become zero at some finite city size. Hence, this is the optimal city size. In fact, it is not quite as easy as that: if average and marginal curves are used, a bewildering set of alternative optima can be identified: least cost city size (minimum average costs); maximum citizen welfare (maximum average benefits minus average costs); social optimum with unlimited population. ..." There are indeed many other possible combinations, including the possibility that the optimum for households may be quite different to that for business organisations.

A more serious drawback is the fact that the meaning of the cost and benefit curves is at best obscure. Leaving aside all the standard economic assumptions (e.g. homogeneous households with a constant set of preferences) the critical assumption is that all benefits and costs are additive. They may in fact be multiplicative. Many of the important items such as pollution, congestion, externalities in consumption, and agglomeration economies for industry, are difficult to measure, and where measureable are hard to convert into units so that one may be weighted against the the other. "Without precise measurement, the 'objective' assessment of evidence degenerates into value judgements, implicit weighting systems and arbitrary selection of criteria." (819)

But the strongest objection to the concept of an optimum city size is that size cannot be evaluated independently of location and function. "The towns and cities of a country form a national urban hierarchy in which there are many, many cities of very different size. ... The existence of the hierarchy as a whole is of critical importance for spatial allocation and as a distributor of welfare. This fact alone makes nonsense of the search for a unique optimum city size. ...

The debate on the social costs of urbanization has been confused by the failure to distinguish levels from rates of change. To argue that there is no optimum size does not mean that cities can never grow too rapidly. Very rapid urban growth may make it difficult for city governments to keep pace in supplying urban infrastructure and basic services and may lead to a deterioration in environmental quality standards. When planners rail about the problems of big cities they are often implicitly arguing not about the effects of size but about the impacts of too fast a rate of growth. ...

[This is illustrated by the observation that] where social costs are high (e.g. water supply constraints or air pollution in Mexico City ...) this is often more a result of the city's location than its size. In other words, these problems are specific to the individual city rather than being an inherent consequence of urban scale. In spite of the abovementioned social costs, Mexico City has much better quality services than other Mexican cities." (820)

Nevertheless, studies of optimal city size abound. Two of the most comprehensive were reported on and criticised in GCT reform. (821)

One of these two was quoted, initially with apparent approval, in the annexure to the report of the President's Council. (822) This annexure redeemed itself however by noting in its summary that: "The finding that services, excluding sewerage, can be provided at lowest cost to towns or cities with a population of 100 000 to 300 000, relates first and foremost to dispersed centres. This cannot be interpreted to mean that a conurbation with a large population can be serviced most economically through a number of adjoining authorities each having a population of 300 000. Concentration and congestion in the main centre, which entail higher service costs, are related to the total population of the conurbation and not to the arbitrary size of the local authorities making up that conurbation." (823)

Furthermore, the annexure stated correctly that: "A proper perspective is necessary in looking at this problem. Though there may well be an optimum size of city as far as engineering services is concerned, the size of a city is not determined by the costs for which it is serviced. There are more powerful influences at work, particularly the greater work opportunities and higher rewards for labour. People do not live in metropolitan areas simply by choice and because of the cultural opportunities offered. The decision is often simply because they must live where the work is done. Because of the complex relationships of commerce, most opportunities for work are in the metropolitan areas." (824)

8.2.4.2.4 Comment on single-purpose authorities

Single-purpose independent authorities fall into two broad categories, namely boards, districts or one or other sort of ad hoc authorities, and the second type, often suitable if the service is a trading type, viz. the public utility corporations. Robson pointed out that the first of these is very much favoured in certain circles in America: "This fragmentation of functions derives from the notion of checks and balances, and the fear of too great a concentration of power in any single organ of government." (825)

Robson himself phrased the case against public utility corporations. Municipal enterprise, if certain conditions are satisfied, is superior to the public corporation. "For the opportunity for effective democratic control over the undertaking is direct and immediate when it is run by the municipality. ... A public corporation, independent board, or commission, is a much more remote body to the ordinary citizen." (826) (See also Section 2.2.3 of this thesis.)

Robarts advanced reasons in favour, in certain highly selective circumstances only, of single-purpose bodies. However it is necessary firstly that the local authorities have the power to create, alter or disband these bodies, and secondly that they have budgetary control over the bodies. (827)

The ad hoc authorities have in a number of instances found that their functions have been usurped by the multipurpose authority or have otherwise fallen away, and they have had to justify their existence. These authorities often try to annex other functions, sometimes inappropriately, in order to stay alive.

According to Crouch, one advantage of single-purpose authorities is that they can be created with wider territorial and financial bases; herein lies a portion of their attraction. However, sometimes these advantages can also be gained from revision of local government boundaries. The disadvantage of the single-purpose authorities is that co-ordination of services provision suffers from the diffusion of power so caused. In some United States examples, the various commissions determine substantial aspects of city development without the benefit of correlation with the local government unit itself. (828)

The President's Council proposals appear to allow for independent single-purpose metropolitan service corporations, and this concept must be firmly rejected on efficiency and effectiveness grounds. (829)

The shortcomings of most single-purpose authorities in respect of the community participation criterion are elaborated upon in Section 8.3.3.2.

8.2.5 THE LITERATURE SURVEY OF ALL SERVICES : CONCLUSION

The second step of the methodology of this thesis requires inter alia that an extensive literature survey, from the efficiency and effectiveness viewpoint, be undertaken into selected aspects of local authority services provision.

One important procedure on the way to making use of this survey is the provisional (before review by other criteria) grouping of services for operation by multipurpose authorities of various sizes, and a noting of externalities. This should only be done with the application of the information to a particular metropolitan area in mind, as circumstances must be compared and the information must be vetted accordingly.

Therefore no attempt is made here to provide any such grouping. The matter may rather be postponed until Chapter 11, where the technique is illustrated by application to the case study.

8.3 THE LITERATURE SURVEY : ALL CRITERIA

8.3.1 INTRODUCTION : ALL CRITERIA

8.3.1.1 Review of criteria

It is early on in this thesis stated that the methodology of investigation must accommodate as far as possible three often conflicting criteria, viz -

- efficiency and effectiveness;
- the need to act within attainable financial resources; and
- citizen satisfaction through the reflection of community values in the process of local services provision.

The nature of these is sketched above. (Section 1.2.)

In an application of the methodology, it would be necessary to look at each of these criteria, particularly the first, in more detail. Each criterion must be qualified in the light of the actual problems, needs, plans and opportunities within the area investigated.

8.3.1.2 Cost-benefit analysis

In Section 4.2.8 above it is noted that Section 8.3.1 gives attention to the reason for complex cost-benefit analysis and techniques of similar sophistication not being used in this thesis. This place is appropriate for a discussion of the matter, after the relevant issues are aired, principally in Chapter 7 and Sections 8.1 and 8.2, and immediately before the "all criteria" literature survey is embarked upon.

It is necessary to recall the definition of the efficiency and effectiveness criterion (Section 1.2) and to describe the principle of cost-benefit analysis, and then to compare them by pointing out the similarities and dissimilarities of each.

All three (efficiency, effectiveness and cost-benefit) are essentially attempts to quantify performance of a service by expression of the ratio of output to input. (In the case of cost-benefit, the ratio sought is the inverse of this.) Thus use of the criterion of efficiency and effectiveness is a cost-benefit analysis, albeit of lesser complexity than is normally understood by the name. They differ however in the ways in which "output" and "input" are expressed, and the scope of the output and input measurement (i.e. what is and what is not included).

Input may be expressed as cost incurred. In the copious literature on cost-benefit analysis may be found seemingly endless discussion of how this is to be measured and indeed what is to be included. Is this producer's cost, or is it the price to the consumer of the service, and what is the relationship between the two? Is this only the cost to those directly involved in the service as producers or consumers, or is it cost to all who are subject to the ripple effects arising from the provision of the service? Are financial costs only being considered, or is an attempt being made to translate into financial terms more ephemeral factors such as e.g. clean air, convenience or even democracy? What account is taken of the passage of time during which the effects of the transaction are being felt?

The ramifications are endless.

When it is realised that output is subject to similar considerations, some idea can be gained of the complexity to which decision-making on the basis of the output:input ratio could extend. Drebin provided a good summary of the difficulties of measuring performance. How for example, he asked, can local government know the effectiveness of preventive measures which it may undertake - how can benefit be assessed when it must be quantified as a number of "non-occurrences"? (829A)

The objective of this Section 8.3.1.2, then, is to describe why the efficiency and effectiveness criterion, as defined, is an adequate tool in terms of the thesis objectives, and why cost-benefit analysis (which, as pointed out above, is essentially similar in principle but a more complex and potentially far more powerful tool) is unwarranted. However it is firstly necessary to describe briefly where complex cost-benefit analysis may be used and what its limitations are - this is done in the next few paragraphs.

There is no necessity here to spend any more time on a description of cost-benefit analysis procedures - there are many textbooks on the subject. Its limitations, not always appreciated by its advocates, have led it into some discredit because it has been stretched to analyse situations with which it simply cannot cope, or attempts have been made to give its inputs and outputs a certainty that was not warranted.

As Oelschlaeger (and many other writers) have pointed out, there are tremendous difficulties in incorporating into an analysis matters which do not have a direct market value. "Theoretically, the utility of any policy alternative can be calculated. But in fact conventional economic calculations of utility amount to conceptual deception." Private enterprise decisions generally need take account of only a restricted range of variables - public enterprise decisions, most of which have implications of "welfare economics", must face a far wider range. "Unfortunately, for welfare economics, not all things of value in life have a market value." (829B)

"The easiest things to overlook - or misunderstand - about CBA are certain fundamental facts. The accuracy of the analysis depends on the soundness of the information used, and much of this consists of stipulations and predictions. The analysis is not objective or normatively neutral. CBA assumes that (1) economic values are basic, (2) all costs and benefits can be measured by the same yardstick, and (3) alternative combinations of costs and benefits can be compared and judged. In the public sector, where the values of benefits are ultimately political, these can be heroic assumptions.

CBA often papers over perilous uncertainties. It can disguise judgments and hopeful estimates by stating them as numbers. It is an always limited and sometimes treacherous mode of analysis.

But people who want to run reality checks on proposals can find it helpful. It asks if claims are economically sound? To varying degrees it answers what it asks. Those who need to know that answer can use CBA with wisdom and caution, to gain some added measure of knowledge for decisionmaking - if they care, and if they are careful." (829C)

"If all decision-makers understood that CBA enormously simplifies the real world, then there would be no problem in using it. ... But insofar as policy debates focus upon a single criterion of evaluation to the exclusion of other potentially more important variables, then the testing of policies has been arbitrarily circumscribed. CBA, in other words, limits policy evaluation to a fraction of its full potential." (829D)

This does not mean that cost-benefit analysis has no value, or even no value in public sector investment decisions only. It has often been used to compare alternative means of achieving the same ends in particular closely circumscribed circumstances, usually where one service at a time is being considered. It is generally very useful in this respect (even if its recommendations are sometimes overturned on other grounds varying from rational equity considerations to the more extreme examples of political irrationality.)

As examples of the justifiable and very valuable use of cost-benefit analysis, five references are taken from the enormous literature available. Cost-benefit analysis has been used with success to evaluate alternative inter-urban highway schemes in Britain, to evaluate alternative public transport policies in London, to compare the benefits of certain urban parks in Massachusetts with their costs, to ascertain whether the shift of the Covent Garden Market to Nine Elms was worthwhile and to assess the economic feasibility of a system of charges for private vehicle entry to the central business district of Cape Town. (Respectively 829E, 829F, 829G, 829H and 829I. But see also Section 7.4.3.3, around 797F, 797G and 797H.)

Thus cost-benefit analysis may usefully be employed to assess either which of several alternative means may be used to reach a particular end (or even slightly different ends), or (with greater caution) whether a particular end is worthwhile at all. It greatly assists if the end is a single clearly defined service (i.e. benefit) with readily quantifiable costs - this reduces the complexity of the analysis, maybe even to manageable proportions!

Enough has been said above on cost-benefit analysis as it is usually understood, and return is now required to the efficiency and effectiveness criterion. This is identified above as essentially similar to cost-benefit analysis in principle, as in their simplest forms both are expressed as output to input or its inverse.

In Section 1.2 it is stated that "efficiency measurements ask if inputs have been used to their best advantage", i.e. is the degree of achievement of service objective maximised?
cost

"Effectiveness measurements ask to what extent the task in hand has been achieved", i.e. at each stated cost level, what is the "degree of achievement of service objective"?

This may now be discussed in terms of the characteristics which are needed in this thesis. In order to apply the methodology, data must be assembled on the way in which service performance costs vary with the quantity and quality supplied of that service. To avoid accusa-

tions of irrelevance on the grounds that for example other variables differ too much for valid comparison, it is necessary that attention be confined to only one scenario. This admissible scenario is that in which a closely prescribed (in output quality) service is offered in comparable areas at the same time; in this case the variables are quantity of the service and cost of the service. Certain variation in input quality may perhaps be accommodated. The data base may be expanded with data gathered at other times from the same or other areas, provided that the areas have remained comparable and that realistic discounts can be made for time. (The inadmissibility of data which springs from different backgrounds and times is demonstrated by the Johannesburg wastewater example (Table 7.4.2.3A above).)

This assembly of data is of course the identification of a cost function characteristic as defined in Chapter 4 above.

Yet this limitation, i.e. to one admissible scenario, is quite acceptable in terms of the thesis needs.

The assessment of efficiency in the thesis methodology would require that data be available in a particular area on the provision of a service or services. The only independent variable is the (in various alternative combinations) plant or authority supplying the service, and each component of each combination has a quantity dimension. It is akin to the real world to assume that a specific quantity and quality of service is demanded, and this may be varied only within narrow limits if at all.

This simplification reduces the analysis to only two significant variables, the second being cost, to the range of which there is no limitation in theory.

All the Figures of Section 7.4 reflect data with this assumption, i.e. comparable quality of service and the variables being only unit cost versus the size of the plant or works or system.

This demand characteristic (i.e. specific quality and total quantity) is particularly encountered where there are in the short term no effective substitutes for the service and/or the parameters of the service are closely defined (often by an outside agency). Examples are potable water supply, electricity supply, wastewater treatment and construction and operation of major roads.

As stated in Section 12.3.1 below (q.v.) there are many local authority services, especially those suitable for control by a metropolitan tier, in respect of which "standards and policies receive general consent among the community". That is, taking a highly simplified view of a cost-benefit analysis, benefit is fixed and only cost varies, which it does with the sizes of the plant or authority combination supplying the service.

This type of analysis is sometimes known as "threshold analysis", which "stresses the importance of indivisibilities in urban investment projects", i.e. by studying the effect of a step to the next plant size or to the next agglomeration of local authorities. (829J and 829K).

On the other hand, also as stated in Section 12.3.1, there are many local authority services in respect of which constant or nearly constant unit costs of production with scale apply and which require product differentiation. That is, in a cost-benefit analysis, cost is fixed and the benefit of each service varies between local authorities. Whereas cost might be comparable, for the same service, from one local authority to another, the benefit from that service may be differently perceived. This readily allows different local authorities to devote equivalent financial resources to different services and yet derive the same total benefit.

The application of effectiveness measurements in the thesis methodology requires study of the change in quality of each service when both quantity and cost change. In other words, assembly of the necessary data for each service requires a series of snapshots of the cost function characteristics, one for each required step in

quality. This data is sufficiently known at all points critical to the thesis methodology. (This is fortunate, because the problems of expanding this data base are considerable.) The principle of diminishing returns to scale (Section 4.2.5) is an important part of the necessary data. For example, in any instance it would generally be known within acceptable limits what would be the costs of, at constant quantity, improving (or relaxing) the quality of the wastewater or the reliability of the electricity supply or the geometric design standard of major roads.

Thus, within the terms of the thesis methodology's needs, any criticism that the valid use of the efficiency and effectiveness criterion requires an appreciation of more than cost function behaviour and the effectiveness data described in the preceding paragraph is not justifiable.

What about comparison between the efficiency and effectiveness criterion and the other two criteria? Lest advocates of complex cost-benefit analysis should claim that they have a ready tool for the comparison of "finance" (cost) and "community participation" (benefit) with efficiency and effectiveness, it is necessary to point to the definitions of Section 1.2 above. The "finance" criterion relates to limitations on finance, and not to costs of finance. The "community participation" criterion relates to ways in which this participation can be achieved, and not to whether these values are achieved or not. It will be seen therefore that the characteristic of finance for example is not as an extra weight to the numerator in a cost-benefit analysis, but is more in the nature of a possible/impossible alternative postulation. The intention once again, as in the efficiency and effectiveness criterion, is to restrict the number of variables at any one time, in the manner of threshold analysis. One setting for this restriction, it is immediately apparent, is "do not exceed (at constant prices) present per capita expenditure". This is a setting close to that often encountered in the real world.

Conversely, the most important variations in cost (not "finance", as defined for the criterion) and community choice of product differentiation are already incorporated in the efficiency and effectiveness criterion, as described earlier in this Section.

The above description should convince that complex cost-benefit analysis and similar techniques have, at their present stage of development, little if any applicability to the thesis methodology. On the one hand, the purpose to which efficiency and effectiveness analyses are being put, with certain variables held constant or varying within close limits only, renders complex cost-benefit analysis unnecessarily elaborate. On the other hand, when the task is faced of having to consider concepts such as "democracy" and "convenience", the technique is not sophisticated enough and/or the complexity required becomes overwhelming.

In short, in the present situation, the benefit of full cost-benefit analysis is overwhelmed by the costs (including non-financial costs) involved. It must in any case be doubted that use of this technique would give a result superior to that used in for example the case study on Greater Cape Town.

Nevertheless, if new techniques could be found to for example quantify with greater ease and assurance the more complex of the variables, cost-benefit analysis would become more acceptable. Research into this is needed.

In any event, it must be stressed, the thesis methodology is not affected. Although in Chapter 6 specific mention is made of cost function characteristics, the call is for all pertinent service characteristics to be discovered and made use of. The method whereby the various criteria are to be weighed is left entirely open.

8.3.1.3 Criteria adopted in two studies

It is of use to spend time at this point on reviewing the criteria that were adopted in two overseas studies of an analogous nature.

Wood reported the criteria considered by the Maud Commission. "The overriding objective of would-be reformers was to obtain changes which would increase both the effectiveness and the democratic control of local government. ... Yet this broad agreement about objectives did little to simplify the policy process. This was because there was no general consensus on the interpretation to be attached to such concepts in the context of the issue of local

government reform. As a result, all the participants could and did claim to be advocating proposals consistent with the overall objectives, yet these proposals frequently conflicted with one another. ...

The difficulty is that no one has ever decided what words like 'effective', 'convenient', 'efficient' and 'democracy' mean in the context of the structure of local government. ...

... 'democracy', could be invoked in discussions about the allocation of functions between different tiers of government. Lip-service was frequently paid to the 'lowest level' principle. For example ... 'a genuine local democracy implies that decisions should be taken as locally as possible'. ... To this, the Commission would surely have replied ... that smaller authorities, in its opinion, could not have been allocated a sufficient range of powers to make them truly responsible." (830)

Wood noted that it was interesting that successive commissions on local government in Britain were asked to seek 'effective' rather than 'efficient' local government. "The latter term is often considered to be inapplicable to local government, where the outputs are frequently of a personal nature (the activities of teachers or social workers, for example). This is because of the common association of 'efficiency' with industry and commerce where profits and sales are clearly measurable and performance can be quantified. ...

The question of resource-allocation leads to two further notions of effectiveness which can conveniently be discussed together; the ability to co-ordinate and to control the provision of local services. At one level this is concerned with the choice of priorities, and at another with the adequacy of supervision of service delivery. The Redcliffe-Maud Commission paid considerable attention to co-ordination, and concluded that a single-tier structure of local government was theoretically the most satisfactory; a council could choose its priorities over the full range of municipal services, and could ensure that all services were provided in the right way at the right time. Others, however, took a different view. They argued that the case for large authorities on the grounds of technical requirements or economies of scale

applied only to certain functions. Many services such as allotments, recreational facilities and footpaths could best be provided by small local second-tier authorities able to supervise their activities effectively. ...

These latter arguments ... reflected a deep-seated mistrust in long administrative hierarchies, and a faith in the value of laymen inserted in such hierarchies at as local a point as possible in order to break them up. Elected members are there, it is claimed, both to ensure that bureaucrats treat their clients equitably and to push these same bureaucrats into action when local demands for an altered level of services are strongly articulated." (831)

Robarts stated that the aims of any suggested changes were "not always compatible ... The first aim is to ensure a strong system of local self-government for the people of Metropolitan Toronto. Local government in Metropolitan Toronto must be seen as a system which is not just capable of the effective administration of various social, physical, and other services but which can also pinpoint and resolve all major local issues. It must become the effective single political focal point for issues important to the community.

The second aim is to devise a system that is suited to the particular needs of Metropolitan Toronto." Robarts mentioned, inter alia, that Toronto has certain unique characteristics such as its dominance in Ontario's urban size hierarchy in terms of both population and expenditure, its "more than twenty years of successful experience with a two-tier system of local government" and, "although its area municipalities and neighbourhoods are diverse in many ways, Metropolitan Toronto functions as a single, integrated urban area. ...

Whatever the structure of government within the boundaries of Metropolitan Toronto, it is obvious that it will have to be sensitive to its effects on the neighbouring municipalities and be able to deal with those governments to handle the broader regional issues and concerns that will inevitably arise. ...

... the focus of responsibility for various services should ... be sufficiently simple and clear that accountability and responsiveness

will be enhanced. As much as it can, the structure should foster a sense of collective involvement and responsibility for the operation of government in the area.

The system of government should be capable of helping to equalize the availability and costs of essential services over the whole area. It would be quite unacceptable if there were wide differences in services or in levels of taxation within Metro. In addition, there must be a capability to provide and to co-ordinate those major services that are area-wide in nature." (832)

The criteria used in these studies, it is apparent, were to a greater or lesser extent similar to those used in this thesis. However the way in which each was handled and especially the way in which the several criteria were combined was inferior. The above description and that elsewhere in Chapters 7 and 8 (especially in the first three paragraphs of Section 8.2.4.2.3) suggest that less use was made in these two studies (even less in Robarts than in Maud) of the quantification of alternatives and comparison thereby than in the thesis. Cost-benefit analysis was not used at all, presumably because of its daunting complexity.

8.3.1.4 Concluding comment on criteria

The job in hand therefore, in any application of the methodology of investigation, is to recommend an organisational structure which will improve the provision of local authority services in the area. ("Improvement" is to be expressed in terms of the three criteria as they are defined and used in this thesis.) This structure will almost certainly be to a greater or lesser extent unique to the area. The improvement must be worthwhile in comparison to the disruptions which will inevitably accompany reform of any existing structure. The new structure must take account of the dynamic context of a growing and increasingly affluent and demanding urban society. This dynamic context has implications for the nature of the institutions needed for services provision.

The interpretation of the research findings thus far in this thesis indicates that a metropolitan-wide view seems most likely to provide a firm foundation for progress. As population grows, economic

development proceeds, and interactions among users and uses of the services become even more complex, the gain from such an integrative view will be even larger. A new initiative in policy appears needed at all tiers to permit the metropolitan view to evolve in an orderly way. New, broad-ranging, and responsible institutions will be needed for this development. They should be consistent with the legitimate roles of governments of general jurisdiction at all tiers. Allowance should be made for there to be some redistribution of powers and functions from the local, provincial and central government to the metropolitan level.

The metropolitan view should enable -

- progress toward more systematic methods for reflecting the external costs associated with the performance of various services, as expressed in the decisions of public and private enterprise alike;
- searching for, defining, evaluating and implementing measures to better provide the necessary services;
- adapting new knowledge and technology to the metropolitan environment being viewed and incorporating them into a continuous management system at an optimal rate, because of this management's continuous responsibility for the services; and
- giving explicit consideration to the impacts of the spatial pattern of economic activities on the demand for services and on the interrelationships between the various services and the quality of life of, community participation of and financial demands on the citizens of the metropolitan area.

As this thesis thus far has devoted almost all its attention to the efficiency and effectiveness criterion, Section 8.3.2 concentrates on the topic of finance, and Section 8.3.3 concentrates on the community participation criterion.

Once again, the discussion is confined to the non-specific-place application of the thesis methodology.

8.3.2 FINANCIAL IMPLICATIONS

8.3.2.1 Introduction : finance

It is necessary at an early stage in the formulation of recommendations for the provision of local authority services in an area under investigation to make some assessment of the financial implications.

It is worth noting that the Maud Committee did not have in its terms of reference any concern for the finances of local authorities. This "suggests that the Government had no wish for the commission to concentrate its efforts on [this subject]. ... Finance was not mentioned presumably because [principally] ... the Government made it clear ... that it saw a reform of local government finance as being appropriately undertaken only after a new structure had been established; the new structure 'should provide a more promising context for drastic reform of local government finance'. ... In the event the Commission not surprisingly found it necessary to devote two chapters in its report to management and finance. After all, its proposed structure was designed to provide services to the public, and both management and finance are crucial facilitators of council outputs." (833)

There is not space in this thesis to deal with finance in any detail. The question of the general adequacy of local authority financial resources is a deep and involved one which has generated a tremendous amount of discussion over the years, and differs greatly from country to country. Even if South Africa only is considered, no general agreement, not even of an interim nature, has been achieved between central and local government, despite the Browne Report, the Croeser Working Group, and other investigations.

8.3.2.2 Adequate finances

It is clear that a separate report, on financial aspects, should follow every assessment of services reorganisation. Particularly it should give attention to -

- reallocation of funding presently available to local authorities;

- funding of a metropolitan tier (if the application of the thesis methodology for any area proposes this); and
- the total financial resources available to local authorities in the metropolitan area as a whole in any new dispensation.

An essential part of the follow-up will have to be an analysis of how the assessment rates basis of each of the existing local authorities is likely to change. Inevitably, a major factor in the acceptance or rejection by each individual ratepayer or resident will be his perception of how the proposed changes will affect his personal contribution to local and metropolitan coffers!

If any new local authorities are established, or new boundaries drawn between local authorities, or new responsibilities added to local authorities, it would be preferable if all local authorities at one tier were to have responsibility for approximately the same range of functions. However a precondition for this is that each of these local authorities is able to meet its consequent financial obligations.

The question arises whether a local authority could not opt for a lesser standard in one or more services -

- either in order to reduce total expenditure, and thereby reduce the deficit (or reduce the assessment rate) or
- in order to spend more on another service or services on which it places a higher priority.

That this is desirable, within limits, becomes clear from discussion in this thesis of "product differentiation". (Sections 4.2.7 and 8.3.3.) Nevertheless there must be metropolitan consensus on the standards of all facets of services for which the lower tier of authorities will be operationally responsible and which exhibit significant externalities.

It is evident that there would invariably be a good case for the taxing authority to be the metropolitan authority. On the one hand, metropolitanising of the tax-raising function would enable a fairer distribution of income, from property rates, from the use of central city facilities, and from other sources. On the other hand, it would enable the cost of facilities built for the benefit of the

whole metropolitan area to be shared between all the local authorities. A fault of the present system which would be done away with is the oft-heard complaint by the core city that the citizens of adjacent local authorities use its facilities but do not pay for them. New areas would be developed at the cost of all citizens, not just those of the local authorities within which the new areas are located. Difficulties, presently encountered in the financing of badly selected jurisdictional subdivisions which only cover homogeneous areas of poorer people who are not able to afford a basic minimum standard of services, would also be overcome.

There are three dominant contextual factors relating to finance which are common to local authorities in metropolitan areas in most countries.

The first of these is the increasing local expenditure in real terms. This is sketched in Section 3.1.3 above. Particularly with the rise of metropolitan communities, some local authorities are playing a very significant role in the national economy. For example Johannesburg Municipality's annual expenditure is of the same order as that of the Orange Free State Provincial Administration.

"All our witnesses who touched on the point were agreed that the forces which have been pushing expenditure up are likely to persist and that local expenditure will continue to expand both absolutely and as a percentage of GNP." (834)

The second dominant contextual factor is the falling of locally raised income behind local expenditure, causing increased dependence on income from central and provincial government.

Maud noted that: "Some, though by no means all, of those who gave us evidence on local government finance thought of the future of local government as necessarily limited by the capacity of the present rating system. ... We for our part believe that a country desiring local self-government should first decide what it wants local government to do and then equip it with an adequate local taxation system." (835)

This statement may be taken as the guiding star for all discussion under the heading of "the need to act within attainable financial resources."

In each application of the thesis methodology, the national and local financial circumstances must be studied to, within reason, come up with a financial formula that will permit the operation of the services provision form which has been adjudged best by efficiency and effectiveness and community participation criteria.

In South Africa, in the further report proposed in this section, there should be a consideration of the Browne Report and the comments on it by a large number of individuals and organisations. Most relevant of these comments is that by the City Engineers. (836)

The Croeser Working Group is, at the time of writing, reported to be engaged in the formulation of recommendations for the financial viability of local and metropolitan authorities in the proposed new dispensation. An important part of its task is believed to relate to the distribution of income from trading services. (837)

The third dominant contextual factor is the uneven correlation between income and expenditure which exists in local areas within all metropolitan areas. There is a need to internalise this difference.

8.3.2.3 Financial conclusions

Before it would be possible to give effect to the proposals for services provision, in any area to which the thesis methodology is applied, various studies would have to be made. Revenue accrual for any authority would, as it is now, probably be derived from three major sources -

- income from services rendered;
- a percentage of property rates and contributions in lieu; and
- grants and subsidies from higher tiers, maybe unconditional and maybe earmarked for capital and/or operating expenditure on particular projects.

However the relative contributions of these three sources may well alter from their present proportions.

Agreement should be reached on uniformity through the metropolitan area on the following -

- the payment for assets transferred from the ownership of one authority to another;
- the valuation policy and uniform date of valuation;
- the distribution of the burden of financing metropolitan-wide services;
- the extent of the intra-metropolitan area transfer payments which will, in addition to higher tier funds, be necessary to sustain the local tier services in the poorer authorities; and
- the maximum and minimum standards of performance of lower tier services; these standards, in conjunction with the assessment of each lower tier authority's financial resources, would determine the transfer payments necessary.

This should make it possible to use the wealth of the entire area, and particularly that derived from property rates in commercial and industrial areas, to finance the services needed to accommodate growth in the developing areas and to provide essential services in the poorer areas.

8.3.3 COMMUNITY PARTICIPATION IMPLICATIONS

8.3.3.1 Purpose of local authorities

The principal task of a local authority is its obligation to provide efficiently and effectively a wide range of profoundly important services concerned with the safety, health and well-being (both material and cultural) of its citizens. The most important reason for maintaining local control is that the local authority is better able than any other authority to identify many of the needs of the community. It permits the local people to make their own judgments, however imperfectly, about what will best suit them. Local knowledge includes the detailed understanding and close concern available only from those who feel a responsibility for and a personal interest in the results.

Although many citizens are apathetic and do not actively participate in local affairs, there is no question that the municipality (whether local or metropolitan) remains a more effective and efficient mechanism for ensuring performance of this principal task than any provincial or central authority could be. This holds true despite the shortcomings of the mechanism (and these include, in South Africa, the lack of franchisement of much of the metropolitan populations). Furthermore, the characteristics of the services operated by local authorities are with a very few exceptions such that full or practically full exploitation of any economies of scale can be obtained by operation within the metropolitan area. Attempts to operate these services over a wider area would only bring with them problems of management and co-ordination which would cause diseconomies to arise.

Of great importance is the demand by all sectors (by citizens, by private enterprise and by other tiers of government) for local authorities to provide an increasing range of services. For example, local authorities in South Africa have in recent years entered a number of new fields. To illustrate, they are increasingly becoming involved in the planning and encouragement (inter alia through the provision of infrastructure) of employment related to urban population, in urban conservation and renewal, in the development and sale of land, and in the improvement of the urban environment.

There is general expectation by the public that current standards of services provision will at least be held and, in many cases, improved upon. Yet current standards are significantly higher than those provided a few decades ago. For example, public health was once limited to the prevention and control of communicable disease. Today it is concerned with the maintenance of community health generally, with control of industrial and environmental health hazards, and with a variety of matters that were formerly considered to be entirely within the private domain. For another example, the standards of wastewater treatment have steadily risen to the stage where, in some cities, the product is potable.

Changing values and circumstances have had an impact on the traditional role of local authorities. Local authorities are

increasingly making value judgements and choices about the future of the community, rather than merely administering routine services. This trend can be expected to continue. Citizens are demanding increased involvement directly in the affairs of local government; they are no longer satisfied with representation by elected councillors. This effect has manifested itself in such ways as the increased reference of major planning decisions to local interest groups affected.

Every decision made by a local authority is political in the sense that it involves officials in making choices between conflicting values which affect the well-being of different resident groups differently. The authority distributes public goods, such as clean air, public health, safety and good neighbourliness, as well as such tangibles as freeways, buildings and parks. These have both an economic and a political price. All the public goods wished for cannot be afforded, and establishing priorities between their production and distribution is a political task. The installation of a stormwater drain or playpark is a political action since it involves the use of public resources which could have been used in some other way or in some other place.

8.3.3.2 Accommodation of value judgements in the operation of local authorities

Scarce resources of local authorities have to be distributed between competing individuals and groups with conflicting desires and goals. Thus ends are in question, and decisions are ultimately a matter of judgement.

As noted above, every decision made by a local authority is political in the sense that it involves choices which affect the well-being of different resident groups differently. In South Africa this issue is very visible. Here there is, in a very simplified view, a contrast between a less prosperous section of the population which also happens to be largely disenfranchised, and a franchised and more prosperous section of the population. This double difference magnifies the issues requiring the attention of the local authority decision-making team. In respect of issues of principle, the local authority official's task is to, inter alia, evaluate the consequence of alternative actions. His skills and his

background enable him to get to grips with this evaluation; his task is to assist the decision-making process, but decisions on the higher levels of policy are not his prerogative.

Hence the mechanism of community participation and its relation to the earlier criterion of efficiency and effectiveness is critically important. It is an area in which research is exceedingly difficult but badly needed.

The subjective and relative nature of need does not imply that judgements of need are necessarily arbitrary. Rather the argument is that a systematic approach can be developed by actively bringing together different viewpoints and criteria for determining needs.

As stated earlier (e.g. Sections 2.2.3 and 8.2.4.2.4) there are two possible objections to single-purpose bodies operating in the metropolitan area. The first is that, not being part of general-purpose authorities, their programmes and priorities may not match closely enough to those of the general-purpose authorities. Thus co-ordinated and comprehensive inter-service planning and action suffers. The second is that they segregate important areas of concern from the consideration of the local authority's mechanism for community participation. Recognising this, Jaffary and Makuch recommended that most, if not all, special-purpose bodies in Toronto be transformed into creatures of the metropolitan municipality. (838)

8.3.3.3 The community participation criterion in metropolitan areas : the need to retain small local authorities

It is clear that one of the recommendations which are evolved as a result of the application of the methodology will often be for a two-tier arrangement of authorities in the metropolitan area. This approach was adopted in Toronto, Britain and elsewhere. The need for community participation has influenced this, especially through three particular interrelated aspects at the lower tier -

- the need to give the lower tier a meaningful range of services;
- the need to increase local accountability; and
- the need to permit service product differentiation.

The last aspect requires some explanation.

In respect of local authority services, neighbourhoods within large cities exhibit substantial variation, and it is therefore not always necessary for a householder or business to shift to another local authority area in order to obtain the closest approximation to the desired environment. Variation in public services can be observed within the limits of the same local authority, as gravel roads remain in the less densely populated suburbs long after most city streets have been paved, and the newer (not necessarily richer) residential areas often have better stormwater drainage than the older areas have.

On the basis of evidence available to him, Thompson wrote that there is greater inter-city variation than intra-city variation in the quality of public services. He argued that this is inevitable, as decisions on the quality of services and, more importantly, on the revenue to be raised (and on the capability of raising that revenue) are made more or less uniform over any particular jurisdiction, but may vary greatly between local authorities.

"Product differentiation in local government, to retain the phrase borrowed from price theory [see Section 4.2.7], may originate in (a) a preference for private over public sources of supply, or the reverse, (b) difference in taste patterns for public services or (c) desire for intimate control over the processes of government." (839) To illustrate, one group of residents may prefer to substitute expenditure on a municipal swimming pool for expenditure on paved streets, while a second group may prefer to dispense with both and to lower the tax rate.

Proposals for consolidation sometimes lose sight of the advantage of "small government" in terms of making it possible for residents to purchase product differentiation in public services. This commodity might well be income-elastic, so that rising per capita incomes increase the preference for small local government as time goes on. Even though this is a sluggish market, it may well be that some residents chose to devote part of their incomes to the luxury of buying small government. (840)

Making further references in private enterprise terminology, Thompson pointed out that not only local government itself but many

of the products of local authorities are very income-elastic; for example, outdoor recreation and anti-pollution measures. Models which are based purely on studies of efficiency and effectiveness in production are quite possibly sometimes of low predictive value. What he termed dynamic analyses, in which demands are created as well as supplied and in which rising per capita income is constantly altering consumption, could well affect judgements on optimum scale in local public services. (841)

While the transfer of certain services to a metropolitan tier would inevitably diminish the field of control of the lower tier of authorities, within their own jurisdictional area and within the framework of their terms of reference they would continue to have full say in the administration of truly local affairs. To emphasise, the purpose of any proposed reorganisation would be in order primarily to rationalise the services provision system where it would benefit from attention at a metropolitan scale.

However the critical decision should not hinge on any losses of status by lower tier local authorities, but should hinge on the implications for the quality of life of the residents of the metropolitan area. The local authority systems are there to serve the residents, not the other way around.

It may in fact be that the chosen mechanism would permit some of the local authorities to gain influence, through participation in and representation on the controlling body of the metropolitan services authority.

8.4 THE LITERATURE SURVEY : ALL SERVICES, ALL CRITERIA : CONCLUSIONS

8.4.1 WHICH FUNCTIONS, WHICH AUTHORITIES?

8.4.1.1 Ylvisaker's maxims

Ylvisaker developed a set of general guidelines for the decision on which functions should be carried out by which tier of authority. He discussed the framework of values within which the areal division of powers should be structured and judged. He introduced values of efficiency but was careful to state that other values assume great importance.

His delightfully-written definitive paper on the subject, although rather dated, is still of great validity. The critical principles expounded are central to the terms of reference of this thesis.

His discussion was in the context of the United States. However this does not detract from the selective applicability of his conclusions to metropolitan areas in other nations. This is so despite his comment that one of the pre-qualifications is that there should not exist "unusual barriers to communication among the component areas, such as might be introduced by the language and race factor in South Africa."

In Ylvisaker's statement of five maxims lies the greatest value of his paper. Four of these are very relevant to this thesis. Maxim 1: if there is any expectation of effective citizen participation, the authorities should cover the whole range of local authority functions rather than a partial range and should be vehicles for the whole process of local government. Maxim 2: the optimum number of tiers among which to share the power would seem to be three. Maxim 3: the areas as subdivided need not be homogeneous communities but, on the contrary, they should possess a certain degree of diversity of interests. Maxim 5: other processes affecting inter-authority relations should be provided for, particularly a process of last resort to settle disputes and questions of jurisdiction, and processes of co-operation. (842)

8.4.1.2 Making a choice

It must again be stressed that, in the application to any particular area of the thesis methodology, the inevitable compromise nature of and imperfection of the process of investigation must be accepted. However this must not deter the investigator.

Evidence from the literature survey must be vetted for -

- its transferability and relevance to the area investigated, and
- to what degree the present and immediate past experience in the area can be used as a guide for the area in the future.

The lesson is -

- "- firstly that the important objectives should be defined before a decision is made and that, in order to achieve a feasible and broadly acceptable solution, the decision-maker should be prepared to trade achievement of some of these objectives against others; and
- secondly that a quantitative analysis, using in our present instance efficiency and effectiveness criteria, and any other quantitative criteria such as that of finance, must be used as far as possible in the decision-making process and only supplemented by value judgements when this is unavoidable." (843)

An analysis such as that contained in Robarts, Maud or GCT reform, founded on a thorough-as-possible assessment of efficiency and effectiveness issues, with review from the finance and community participation stances, is far superior to a decision based on value judgements all the way. This is so even if it has had to fill in some unavoidable gaps with educated guesswork and value judgements. On the other hand, in an analysis of this type, value judgements do have a role to play. Analysis, be it noted, is performed as an aid to the decision-maker and not as a replacement for him.

In a broad sense even the efficiency and effectiveness analysis cannot be free of value judgement, for clearly the values of the investigation determine to some extent the type of research done and the questions viewed as important. However every precaution should be taken to keep personal values out of the analysis; positive elements must be carefully distinguished from normative elements. The literature survey should deliberately seek a competition of ideas, with the intention of bringing biases and value judgements into perspective.

The decision-making stage should preferably be the only stage in which value judgements play a great role.

8.4.1.3 Readings on categorisation of local authority services

A number of readings on the categorisation of local authority services into two general groups are of interest at this stage. Some of these readings are mentioned earlier in this thesis. These

readings advocate the horizontal division of services in order to separate those services of a nature more appropriate to a higher tier of local authority from those appropriate to a lower tier of local authority.

Hutcheson and Prather discussed the possibility of separating the labour-intensive from capital-intensive facets within each service. "Such alternatives may help maximize the benefits of both centralization and decentralization in service systems." (844)

Theron stated that: "Irrespective of individual variations, local authorities fulfil two basic functions in the life of the community. The first is a service function, i.e. to supply the local community with certain services such as sanitation, streets, water and electricity. The second is a governmental function, i.e. to order and to regulate the life of the community, within the scope of powers granted, by determining priorities in connection with the supply of services, township layout, location of industries, licensing, the provision and siting of community amenities, and the procuring and the spending of funds.

The former function is performed against the background of standards of efficiency, such as the optimum use of human and material resources and optimum satisfaction of needs. The latter function is performed against the background of civic considerations, i.e. the promotion of the public interest, the effective participation of the population, community development, the maintenance of public order and social harmony, or any other criterion selected in conformity with the prevailing and accepted system of civic values." (845)

The City Treasurer of Durban came to similar conclusions from a different viewpoint. "The major inter-racial problem arises from the local government services which are largely personal in character, e.g. baths, clinics, parks, recreation grounds, libraries, etc. There is no problem regarding the impersonal services such as electricity, water, roads, stormwater drainage, markets, abattoirs, etc." According to him, which services should be allocated to which tier would depend on the balance between economies of scale, various financial arrangements, and whether the services were "personal" or "impersonal", with the implications which he sketched. (846)

In Britain, "the principles on which responsibilities have been allocated to county or district councils are as follows: functions which need to be planned over a substantial geographical area are allocated to the county council. ... Functions which, while not necessarily needing a large geographical area, need a large 'case-load' to permit the economical employment of a range of specialised professional staff or the economical provision of a range of specialised installations are allocated to district councils in metropolitan areas and to county councils elsewhere. ... The distinction is made in this way because in the metropolitan counties every district has a large population and substantial resources, unlike most districts elsewhere. Functions which are essentially local are allocated to the districts everywhere. ... Services which it may be appropriate to provide on either a very local or wider basis are allocated to both levels everywhere." (847)

The President's Council referred to a "functionally dual system of authorities for 'hard' and 'soft' services. The Committee recommends that the division of functions ... be made and guidelines be laid down. ... The 'soft' functions should be exercised by the elected local authorities which would have the power to make by-laws and regulations. ... Practical circumstances in each particular case will dictate the most appropriate system of authority for each city, town or region." (848)

Referring to "hard services", "as a result of economies of scale, and owing to the fact that such services are usually rendered on a large scale, lower costs can be obtained for the local consumer. ... [Referring to "soft services"], there are those that can be distinguished as community-sensitive or culturally-sensitive, which the community wishes to render for itself." (849)

While these categorisations listed above are by no means identical, there is a trend of general philosophical agreement between them. All of them concern themselves with the need to split responsibility for services between two tiers of authority.

In each case, there is agreement that those facilities of a more capital-intensive nature, of a more impersonal nature, serving a more "service function" or "order function" or which require a

larger geographical area or a larger case-load, are more appropriate to the upper tier of local authority. The readings generally agree that this tier is more able to exploit the economies of scale and area-wide consideration which these types of services, or facets of services, require. On the other hand, there is general consensus that what is described as "the governmental function", or the "personal services", or the "welfare function", or services which are more labour-intensive, are not susceptible to economies of scale, do not require a large case-load, and are more subject to local tastes and needs and product differentiation, are more appropriately housed at the lower tier.

The general spirit of all these readings accords with the findings of this thesis.

8.4.1.4 Balancing the countervailing forces

Thompson made the definitive statement on this topic, as follows:

"The trick is to find the net balance of these two sets of countervailing forces, the cost economies of large scale and the preference for the personalized styling and control which comes with small scale, so as to be able to identify the level of local government most appropriate, public service by service. Some public services display a set of attributes that clearly fall at one end of the spectrum or the other. Compare sewage [wastewater] disposal and storm drainage systems at one extreme with neighbourhood playgrounds at the other. In sewerage and drainage the internal economies of scale are considerable, especially for those communities far from the river or other place of final disposal. The external economies of scale are even more critical; one community's sewage can pollute another community and one's storm run-off can flood basements in another.

With cost heavily favoring organization of sewage disposal and drainage at a gross grain of local government we turn to quality considerations and find only the weakest force of attraction toward finer grain local government. Sewage disposal and storm drainage are not functions which admit of much styling to affect local tastes. Once the decision to convert from private septic tanks and

catch basins to public sewers has been made, the pipes must reach all the way and reach no farther. ... Compare the sewer system case to that of neighborhood playgrounds. Internal economies of scale are nominal; additional swings, tennis courts and baseball diamonds are added at nearly constant unit costs. If anything, larger tracts of land are harder to locate in urbanized areas and will tend to come at higher prices per acre than smaller tracts. Moreover, the probability of park users travelling from outside the taxing jurisdiction that supports the playground probably increases with the size (diversity) of the facility. Thus small neighborhood playgrounds do not confer important benefits without costs nor inflict sizeable costs without benefits on neighboring political subdivisions, while big ones may.

Finally, not only is there little if any cost advantage to be gained by organizing this activity at any local governmental level higher than the very lowest, but a modest element of product differentiation is evident in playgrounds. ... While varied recreational programs could be instituted from a high central office, to fit the different needs and wants of the various subdivisions of the urban area, the decentralization of neighborhood playground administration would seem to be rational if any positive value is placed on having intimate local government and easy political participation." (850)

"The argument for metropolitan government to rationalize unco-ordinated, duplicative, and otherwise generally inefficient local public services is remarkably parallel to the traditional arguments for creating regulated monopoly as a means of eliminating wasteful competition. [See Section 4.2.3.] Moreover, the industries in which 'destructive competition' was replaced by regulated private monopoly - the 'public utilities' - are largely ones in which very substantial economies of scale are inherent and in which the product is highly standardized, for example, electricity, gas, telephone communication, and transportation - industries very similar to our sewer and water example from the public economy. At the other end of the spectrum, neighborhood playgrounds were likened to monopolistic competition, where product differentiation and the lack of substantial large-scale economies, combined to create conditions conducive to the proliferation of many

small suppliers of these governmental agencies. To complete the market analogy, the nature area may be likened to heterogeneous-product oligopoly. [An oligopoly is a market with only a few firms, at least several of whom are relatively large so that changes in their output levels can significantly affect market prices.]

The large automobile oligopolist produces only a very few basic body shells and engines common to all its models, and then allows relatively autonomous divisions of the corporation to ornament these common components so as to appeal to different tastes. The objective is to achieve large-scale economies AND range of choice. [Emphasis added in the thesis.] Whether this industrial parallel is a strong or weak analogy, the inference is clear that, ideally, we would selectively consolidate those public services or those of their components which can be standardized and subjected to mass production efficiencies, leaving the lower level governments to ornament the basic product. ...

One of the biggest steps we could make toward economic rationalization of the local public economy would be to disaggregate important public services into (1) those components which are sufficiently standardized and/or sufficiently free of local possessiveness to warrant centralized production if economies of scale so warrant, and (2) those which are not. We would need to add understanding of efficient strategies for combining the two parts, the basic and ornamental, to produce a final product that did not look like a camel." (851)

Warren advocated agency arrangements. "Organization as a municipality does not end the range of choices of a community. Control over the provision of services does not require that they be produced by the same jurisdiction. Thus a small municipality can realize economies of scale by separating production from control over the provision of services and utilizing external producers. This can be achieved by such arrangements as contracting with a large unit for public health or law enforcement, by voluntary membership in a special fire, library, or sewage-disposal district, or purchases from private firms. Under such arrangements, the community has the right to negotiate the service levels provided to its residents and, in all cases, has the right to withdraw and utilize other options.

Motivation of large-scale producers to maintain or increase their share of the municipal services market is a necessary factor in the model. The decentralization system creates interdependencies, so that few goals of large-scale units can be achieved through unilateral action. A central city may seek to recruit adjacent cities to contract for sewage disposal facilities in order to realize scale economies in a treatment plant which requires a large volume of sewage. Similarly, the central city may find it desirable to offer water for sale to other jurisdictions in exchange for permission to run pipelines through their boundaries and gain efficiencies which would not otherwise be possible." (852)

Warren noted that: "When a city chooses to produce a service, it can be presumed that, on balance, the social and economic costs of transferring production to an external agency exceed the costs of local production." (853) Further to this statement, it could be that by not taking part in a combined production of the service, an authority could be causing harm to other authorities. So perhaps there is an argument that sometimes the municipalities should be forced to take part in selected joint services.

It is not possible to take this generalised judgement any further. Further consideration must await investigation of specific services in specific instances.

8.4.1.5 Variety in the arrangements for services provision

In making decisions as to how the services should be grouped together for performance by local authorities, and which authorities should be responsible for each of them, certain partly analytical and partly value judgements are needed - these are set out in Section 5.2 above.

In the statement of the methodology of investigation offered by this thesis, it is stressed that, while there are many common points, no universal "model answer" can be discerned. This is because of the wide differences in inter alia perceptions, local traditions, existing services provision arrangements and the history of problems and successes associated therewith, major service provision measures which have to be taken in the near future, and existing adequacy or

inadequacy of finance and other resources. The third step of each investigation must be an analysis of information on service characteristics as applied to the context of the chosen metropolitan area itself.

Thus it is not surprising to find that very different patterns are discovered in the several areas described below.

The example of two-tier municipal government in Metropolitan Toronto is often quoted in this thesis and in GCT reform. A brief description of its motivation, general philosophy and division of responsibilities may be found in GCT reform. (854)

The Greater Vancouver Regional District (GVRD) is a partnership of local authorities working together on common problems and providing essential regional services. It differs considerably from the Toronto system. Its uniqueness lies essentially in the way in which each local authority decides whether it provides the service itself, even knowingly at increased cost, or whether it receives the service from the regional district. Therefore the district is akin to a very comprehensive voluntary arrangement. It is not surprising that the services run by GVRD are mostly those which other investigations have identified as "hard" or "impersonal". (855)

The English local government form, its founding investigation by Maud, and the amendments introduced by the central government of the day, are also often quoted in this thesis and in GCT reform. Of particular interest are the general description of Maud's thought process and findings, and the qualified implementation of these findings. (856) Services in metropolitan areas provided by the two tiers of local government (the metropolitan county and the metropolitan district), the central government, and the largely independent water authorities and other quasi-government organisations.

Australian metropolitan areas rely heavily on state departments for provision of nearly every metropolitan-scale service. (857) For example "NSW [New South Wales] laws over-centralise control of City planning and development in State Authorities." (858)

Many and varied arrangements pertain in South Africa at present for the provision of metropolitan-scale services. These range from the central government or SA Development Trust appointing the core city as its agent for the provision of housing and associated infrastructure, the provision by the core city of a range of services on behalf of some adjacent local authorities, the involvement of central government departments (e.g. Directorate of Water Affairs), and, a development of recent years, various inter-authority services planning combinations. These latter include such uniform arrangements for all metropolitan areas such as MTABs, and unique arrangements such as the Durban Metropolitan Consultative Committee. (859)

In addition, common to all the examples listed above, are the involvement of central or provincial government, quasi-government or private enterprise in the planning and operation of certain services. Usually these include public transport and electricity generation (and maybe supply as well).

8.4.2 ALTERNATIVES : ORGANISATIONAL CHANGE

8.4.2.1 "No change"

The absence of a centralised decision-making mechanism does not mean that metropolitan issues cannot be resolved. Evidence indicates that decisions are made, agreements reached, and disputes settled in a variety of ways. Bargaining, informal understanding, formal inter-authority agreements, and the creation of new agencies, are all possible methods whereby action is able to take place on issues which extend beyond the scope of the individual jurisdiction.

It should not be assumed that each local authority acts independently without regard for other public interests in the metropolitan community. The traditional pattern of a metropolitan area with its multiplicity of jurisdictions may more appropriately be conceived as a "polycentric political system". Polycentric connotes many centres of decision-making which are formally independent of each other. Whether they actually function independently, or instead constitute an interdependent system of relations, is an empirical question to be answered in each

particular case. Collaboration among the separate local authorities may be such that their activities supplement or complement each other. Competition among them may produce desirable self-regulating tendencies similar in effect to the "invisible hand" of the market. Competition among authorities may also, of course, have detrimental effects, and may therefore require some form of centralised decision-making to consider the interests of the area as a whole.

No general conclusion can be reached; the circumstances of each metropolitan area must be looked at.

8.4.2.2 Agency etc.

A local authority could confine itself to decision-making and financing, and could pass the performance of some service to another organisation.

Advantages of alternative arrangements vary by service and by authority. Among the advantages sometimes obtained over independence are easier financial arrangements, lower costs and better service, through the use of more qualified personnel and exploitation of economies of scale. (This topic was introduced in Section 5.2.)

Local authority officials everywhere usually have a strong preference for service provision by local authority departments. This is the arrangement which gives them greatest control, in the public interest, over service provision. For this reason, the alternatives to direct departments must demonstrate a combination of convenience, flexibility, speed, cost-saving or quality improvements which is sufficient to offset this preference.

Policy options on the choosing of municipal service provision arrangements were thoroughly discussed by Kirlin, et al. The authors pointed out that an important factor is the ready availability of alternative arrangements. These must exist and must be considered to be effective and viable. As an example, private firms offering wastes collection are encountered more frequently than are alternatives for the supply of road space or major land drainage, at least in the United States. (860)

An advantage of contract (whether by other governmental agency or by private enterprise) as opposed to the performance by local authority own departments, is that these forms of agency or delegation or contract reduce the need to change statutory boundaries and geographical areas of distribution or statutory obligations to provide certain functions for the residents. (861)

The arguments for and against agency, delegation and other forms of inter-authority co-operation must be aired in the specific case.

Advantages, if any, of this type of co-operation would most likely apply to the case of a local authority of a size too small to exploit economies of scale. A larger authority could perform the service on its behalf, or it could pool resources with one or more local authorities also of a small size, in order to exploit these economies.

The performance by private enterprise of local authority services is an option only in respect of selected facets of services in restricted circumstances. Its advantages should be considered in these cases, but there is no suggestion that private enterprise could perform the major tasks and comprehensive range of activities which are presently the responsibility of the local authorities.

The private enterprise alternative is more likely to be successful in respect of lower tier services than metropolitan tier services, because -

- alternative agencies are more likely to be available for the lower tier of services, because the resources required are less and performance of the service is within reach of smaller firms; and
- there is, because of the greater strategic consequences of non-performance, a greater reluctance on the part of officials and elected representatives to lose direct control of metropolitan-wide services than of localised services.

Nevertheless there are many precedents in all countries for services, especially the so-called trading services, to be provided by private enterprise on a metropolitan basis. They include the supply of water, gas and electricity; the operation of public

transport services within the city and its environs; and wholesale food markets and abattoirs. They are, or can usually be made, financially self-supporting or even profitable. In consequence, municipal enterprise in the trading services is sometimes discarded in favour of a commercial company operating for profit and regulated by public utility legislation or bound by the terms of a concession.

Private enterprise responsibility for a service, unless this responsibility is only as a contractor or consultant, has the same disadvantages listed elsewhere (Sections 2.2.3, 8.2.4.2.4 and 8.3.3.2) which count against single-purpose authorities, viz -

- poorer co-ordination with other services, and
- limited accountability to the inhabitants of the metropolitan area.

On the positive side, private enterprise, acting as a contractor or consultant, may contribute to product differentiation. Also, it is often claimed, private enterprise is in certain circumstances more productive, but this is just as often disputed.

An overview of the topic of public and private enterprise in the performance of local authority functions may be found in GCT reform. (862)

No generally applicable conclusion can be reached; the circumstances of each metropolitan area and particular service must be looked at.

8.4.2.3 Incorporation, or provision by the core city

What might appear at first sight to be the most obvious solution to the problems of services provision in a metropolitan area is expansion of the core city to cover the metropolitan area, or the provision by the core city of services of a metropolitan nature. (863)

However, expansion implies a single-tier authority with metropolitan-wide coverage. In all the larger metropolitan areas it may be expected that a single authority would be too large and impersonal to suit the tastes and conditions of the people in the different local areas, and would inhibit community participation, as

previously defined. It may also be expected that it would suffer more than any other alternative organisational form from the problems endemic to large bureaucracies.

Provision by the core city must also be recognised as a less than optimum solution, inter alia because less participation is enabled of the communities who do not happen to be voters in the core city.

8.4.2.4 Debate

"The great task confronting legislatures and statesmen is to provide the metropolitan community with a regional government designed to satisfy modern needs in regard to organization, planning, co-ordination, finance and the other prerequisites for a satisfactory performance of the municipal functions on which the civilized life of urban man largely depends." (864)

The services provision organisational forms in metropolitan areas are often nothing more than town forms which have been stretched and adapted in quite conservative fashion to handle bigger jobs. This has had some unsatisfactory results because metropolitan areas pose operational problems that are innately different from those posed by single towns.

The organisational forms are at fault because they have been adapted beyond the point that mere adaptations can serve. This is how human affairs often evolve. There comes a point at increased degrees of complication when actual invention is required.

Referring to the proposals for incorporation and various ad hoc arrangements which have arisen in most metropolitan areas, Robson commented as follows: "These diverse arrangements, whether legal, financial or administrative, are essentially devices for overcoming the lack of unity and coherence in the government of the metropolitan region, and the congestion which so often afflicts the great city. They are not solutions of the problem : but rather substitutes for a solution. [Emphasis added by the thesis.] Regarded merely as expedients, they have much to commend them; but if they are regarded as attempts to cope with some of the greatest problems of modern urban life, they are puny and insignificant.

Moreover, they bring great disadvantages in their train. ... Such activities do not strengthen local government in the metropolitan area; and it is doubtful if they even enhance the sense of community among the people in the metropolitan region." (865)

This may be an overstatement in respect of most metropolitan areas, but the fact remains that there are few metropolitan areas that would not benefit from an application to their local authority services provision organisations of the methodology of this thesis.

This is not to say that agency, delegation etc have no place. Quite the contrary: they may be the means of maximum suboptimisation. Once the basic structure has been revised, then agency, delegation etc may be introduced to effect the best compromises where the basic structure is unable to accommodate the inevitable clashes among the criteria set.

Arrangements in most metropolitan areas for the provision of local authority services have grown up in an ad hoc fashion, and adaptations are superimposed on structures established many years ago. It would be reasonable to expect that rational examination of the whole structures (basic structure plus superimpositions) could identify measures capable of effecting substantial improvement. The plea is thus entered for such a systematic review.

8.4.3 THE CASE FOR ADAPTATION, FOR GRADUAL, PLANNED CHANGE, AND FOR PERIODIC REVIEW

8.4.3.1 Adaptation and gradual change

It may be asked if a gradual, piece-by-piece, alteration of the local authority services provision organisation in metropolitan areas might be more advantageous in the long run in comparison to a quick-as-practicable reconstruction. Although the gradual approach may represent the long and precarious way around, if the transitional phase is deliberately planned as such, and if the function selected as a first step is chosen as the cornerstone of a more general reform, then the gradual approach might in the long term achieve a better result in terms of the satisfaction of community values.

Recognising that change produces difficulties of its own, it must be ascertained what the likelihood is that a partial change (i.e. adaptation) can produce most of the benefits without the upheaval of implementing a new system. Some of the local authorities involved would be in favour of continuing or adapting present arrangements as far as possible. The extent to which adaptation could occur would differ from service to service and from authority. It could be suggested that perhaps a partial reorganisation in respect of certain services only or of certain authorities only would be of greatest cost-benefit. In other words, only those changes which would confer the greatest advantage to users of the services would be tackled initially, keeping options open in respect of the other changes. (866)

In respect of neither "gradual change" nor "adaptation" can comment of general validity be made. The circumstances of each metropolitan area to which the thesis methodology is applied must be looked at.

8.4.3.2 Periodic review

Whichever approach ("gradual change", "adaptation", or "quick-as-practicable", or even "no change") is used, there must be subsequent adjustments and counter-adjustments. The organisational form for services provision, while it must always be a process of equilibrium, must not be seen as static, i.e. in a state of equilibrium.

There must thus be arrangements for adaptation to social, economic, political, demographic and technological changes and to changes in demands made on local authorities.

The changes would, inter alia, be changes of -

- structure;
- functions performed;
- jurisdictional boundaries; and
- financial resources.

Some of what are now the most important local authority services were not of great significance a generation ago, and in thirty years' time the main activities of a local authority are likely to

include some that form no part or only a small part of its work today. Furthermore, the distribution between what are appropriately services of metropolitan concern and services of lower tier concern is likely to change. To give a topical example, twenty years ago solid wastes disposal was not a problem which harboured great externalities. Since then there has been increasing urbanisation and therefore increasing distance to suitable disposal sites. Mere dumping, without treatment, is no longer environmentally acceptable. Furthermore, the possible benefits of solid wastes reclamation are becoming apparent. Thus, in the 1980s and beyond, disposal is increasingly a matter for co-operation and inter-authority joint action, or alternatively for the take-over of the problem by a metropolitan tier.

Also, the change in technology over time has permitted changes in characteristics of services and the creation of new opportunities. An example here is the availability of centralised comprehensive and increasingly sophisticated data banks. At the same time, technology has permitted certain services that were previously decentralised to be centralised, and vice versa; an example here is once again data storage and use.

There must be a period after major organisational change, such as the establishment of a metropolitan authority, during which further changes should be avoided if at all possible. Changes should certainly not affect the basic principles of the new form. The new form must have time to settle down. Maud suggested "at least the first five years of operation." (867)

Maud commented, and his comments are of equal relevance to many other metropolitan areas, as follows: "... there has been a failure to adapt adequately the pattern of authorities not only to the pattern of social and economic activity but also to the changes in local government's functions that have occurred since the present system was established. ... The harmony which, in our judgement, will exist at the start of the new system between the pattern of main authorities and the functions of local government must be maintained." (868)

The initiative for proposing change should be allowed to come from any of the tiers involved, including central government.

Robarts made out a good case for making specific provision, in the statutes governing the metropolitan system, for change to take place as and when necessary.

"One of the greatest strengths of the metropolitan system has been its flexibility. From the beginning, its architects recognised that the structure should be able to evolve with changing circumstances. ... This acceptance of the need for change has led to an expectation that structural change will be relatively frequent. It has also encouraged those involved in the system to look for ways to make it work better." (869)

Robarts accordingly recommended that "a general review of the metropolitan system be instituted in not less than five nor more than ten years." (870) This is a good example to follow.

8.4.4 IMPLEMENTATION

8.4.4.1 The costs of change as a disincentive to change

Any reorganisation, it could be argued, involves the risk that citizens would suffer, even if temporarily, from breaks in the service they are receiving. Local authority officers would have to devote time and effort, which could otherwise be used to improve the service, to the process of reorganisation.

Say that in an application of the thesis methodology it is concluded that the provision of local authority services is in a by no means chaotic situation, that the standard of performance is in most respects satisfactory, and that the unsatisfactory service is limited in area and in impact, but that a revision and reorganisation of the present arrangements will be of undoubted general benefit. It must be assessed whether this benefit is sufficient to discount the effect of the disruption which would inevitably accompany the implementation of change and which would last for some time beyond the implementation. "Making changes involves not only introducing something new, but undoing what already exists. Converting present practices to new ones can be expensive." (871)

It is impossible to generalise on the consequences of disruption. Disruption during reorganisation can be minimised by careful advance planning of reorganisation and the reallocation of responsibilities. Two guidelines apply, in any change.

Firstly, as much continuity with present operations is required as can possibly be obtained.

Secondly, speedy establishment of the new or amended authorities is desirable, so that the extent of inevitable relative inefficiency and ineffectiveness during the change-over can be held to a minimum.

If the benefits of changes are relatively predictable, the benefit-to-cost ratio of any process of change can be maximised by minimising the disruption of the process of change.

If the bodies of expertise which are presently involved in the provision of metropolitan services are dissipated, there must inevitably be a material fall in the quantity and quality of metropolitan services rendered. A period of years would be required before any authority established under any other basis would become adequately staffed, experienced and skilled to provide at least the current standard of metropolitan services. Backlogs of services provision in certain critical areas would increase while the new authorities competed with each other for staff.

However, if new authorities were as far as possible to establish themselves by simply incorporating chunks of existing organisations, this would maintain momentum in the provision of services and would reduce the risk that the process of reorganisation might harm local authorities as going concerns.

Thus the two guidelines, above, should be followed.

8.4.4.2 Process of change

A timetable would be required for the implementation of the recommendations which are finally accepted.

Five steps and a follow-up can be outlined. Firstly it is necessary to refine the proposals, to debate and gain acceptance or to modify; secondly to pass the necessary legislation, and hold elections (if any) and make appointments to controlling bodies; thirdly to assemble the resources (for a certain period there would be operation of the new machinery side by side with the old); fourthly to formulate policies; and finally to achieve the smooth take-over and to assume full responsibility. Operation, planning and further policymaking would then become a continuous process. Once the necessary legislation has been passed, and elections (if any) for the new council have taken place, a change-over period would be required before the new local authority forms would be fully in control.

All this would, overseas experience suggests, require several years.

The need for public debate and acceptance of the proposals for change should be noted. The writing of Maud's report was preceded by a comprehensive process of gathering evidence. This process included a massive number of meetings throughout England, not only with government bodies at various tiers but also with representative community, business and industrial interests and a multitude of other interest bodies. This process benefited both the Commission and the community.

The initiating of momentum for the cause of change in any area to which the thesis methodology is applied will require a public debate in a wide forum. Affected groups will need to be convinced that, whatever their demerits, the proposals are a vast improvement on the present services provision forms. (872)

8.4.5 LIMITED EFFECT OF ORGANISATION

Two important factors remain to be stressed.

Firstly, structural reorganisation of local authority services provision is going to have very little effect if the service and governmental problems are such as to make any contribution by reorganisation quite insignificant from the start. Administrative weaknesses, shortage of finance, political and racial conflicts, and

critical shortages arising from rapid growth are situations which would hardly be affected by, for example, the superimposition of a metropolitan services authority where one did not exist before.

Secondly, the quality of management in the local authorities, at both the metropolitan and lower tier, is important. The success of the new services provision authorities will vary as much firstly with the abilities of the personnel appointed, especially the managers, secondly with the abilities of the policymakers, whether elected or nominated, and thirdly with the relationships of personnel with each other and with the personnel of other authorities, as it will with the characteristics of its area or with the organisational arrangements.

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I INTRODUCTION

1. Criteria and objectives
2. Local authority services provision forms in metropolitan areas : alternatives
3. Necessity for change, and approaches to change

II SYSTEMS AND METHODOLOGY

4. A deeper investigation of the nature of the efficiency and effectiveness criterion
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IV CASE STUDY

9. Case studies : general remarks
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13. Case study : Greater Cape Town : further studies

V CLOSURE

14. Conclusions and commentary

9

CASE STUDIES : GENERAL REMARKS

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Chapter objective

The chapter objective is to outline how the thesis methodology was applied to the context of Greater Cape Town.

Chapters 10 through 13, in conjunction with Chapters 7 and 8, tell how the thesis methodology was applied by the author to the context of Greater Cape Town.

The first step of the application of the thesis methodology to GCT, as it is to any other metropolitan area, is an analysis of the local situation. This includes consideration of the statutory background, local traditions of and mechanisms for community say in the determination of priorities, financial resources, personnel resources, established services provision forms, existing standards of service provision, and imbalances between areas and between services in respect of the satisfaction of the need for services.

The local information may be obtained from a literature survey and from local practitioners, such as local authority personnel, researchers, contractors and consultants, as well as (if possible) from the consumers of the services in question.

Chapter 10 initially indicates how Greater Cape Town is suitable for an examination and illustration of the methodology, and thereafter corresponds to the first step in the methodology.

The second step is a research and analysis of pertinent service characteristics in other areas but which provide information applicable to the circumstances of GCT.

Chapters 7 and 8 correspond to the second step.

The third step is an informed and critical amalgamation of information obtained in the preceding steps. The efficiency and effectiveness criterion applies. The step includes an assessment for relevance of the information obtained in the second step, and its blending with the local information. Tentative conclusions are drawn at the close of this step.

Chapter 11 corresponds to the third step.

In the fourth step the efficiency and effectiveness criterion is weighed against the financial and community participation criteria. The optimum organisation, given the local circumstances,

for the provision of local authority services is set out. If this optimum is not achievable in the short term, a strategy for its realisation (including a statement of necessary procedures and resources) is discussed. A programme and review procedures are laid down.

Chapter 12 corresponds to most of the fourth step.

Chapter 13 describes the further work required were the recommendations of Chapter 12 to be carried through to implementation.

With the resources available to him, the author was able to embark on only one illustrative study. It cannot therefore be claimed that the methodology has been truly "proven". The research design and implementation problems involved in such a process would be considerable. For a start, more carefully chosen case studies would be necessary.

The term "examined" is more justifiable. Thus the methodology is in these chapters, taken together, "examined" with a view to both illustrating the use of the methodology and trying to discover flaws in it.

10 CASE STUDY : GREATER CAPE TOWN INVESTIGATION

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10.1 GREATER CAPE TOWN : A SUITABLE CASE STUDY

10.1.1 Required characteristics

10.1.2 Greater Cape Town : suitability characteristics

10.2 GREATER CAPE TOWN : SERVICES BACKGROUND, PROBLEMS AND ACHIEVEMENTS

10.2.1 Background

10.2.2 Problems and achievements

10.2.2.1 Crisis?

10.2.2.2 Present practice summarised

10.2.2.3 Present practice in more detail, and problems noted

10.2.2.4 The need to build on the lessons of the successes in present practice

Chapter objectives

The objectives of this chapter are -

- to motivate the choice of Greater Cape Town as a suitable case study for an examination and illustration of the thesis methodology; and
- (being the first step of the thesis methodology) to describe in summary fashion the provision of local authority services (especially engineering services) in Greater Cape Town.

10.1 GREATER CAPE TOWN : A SUITABLE TEST CASE

Objective

The objective of Section 10.1 is to motivate the choice of Greater Cape Town as a suitable case study for an examination and illustration of the thesis methodology.

10.1.1 REQUIRED CHARACTERISTICS

The primary objective of this thesis is "to devise a methodology which should be used in the investigation of organisational forms for the provision of local authority services, especially engineering services, in any metropolitan area". (Section 1.3; note also the exclusions quoted in that Section.)

Achievement of this requires inter alia the examination, by means of a case study, of the methodology.

Ideally the metropolitan area chosen for this study should be one in which all the principal characteristics of a metropolitan area, the local authority services provision form of which requires attention, are present.

These characteristics include growth rate, size, relative importance in the nation, disparity in size and resources between individual local authorities, fragmentation and overlapping of responsibilities, and increasing encroachment by other tiers of authority. There should also have been a long passage of time since the last reform.

In respect of all these, it should occupy the middle rank of complexity, relative to all metropolitan areas. It would not do if, for instance, encroachment had reached to such an extent that local authorities were no longer responsible for the majority of what are referred to as "local authority services". Nor would it do if the area chosen were one of the very biggest metropolitan areas in the world, with a unique set of difficulties. An extreme characteristic would not destroy but would certainly call into question the validity of an examination of a methodology that is intended to be applicable to any metropolitan area.

It is furthermore essential that local authorities in the area chosen should be responsible for a comprehensive range of services, with no significant omissions that would bias any conclusions that may be drawn from the test.

Finally, it is desirable that the area should have a heterogenous population, so as to highlight aspects such as imbalances between resources and needs, and problems of satisfaction of the community participation criterion. (GCT is no more extreme in this respect than most United States or Third World cities.)

Greater Cape Town is in all these respects very suitable, as the following section (Section 10.1.2) spells out. Examining the methodology by means of a study of GCT has therefore a good chance of exposing major weaknesses in the methodology.

Furthermore, GCT has the advantage of recently having been the subject of a detailed and well-documented study which provides all the data and discussion necessary to the examination of the methodology.

10.1.2 GREATER CAPE TOWN : SUITABILITY CHARACTERISTICS

To a greater or lesser extent, all of the characteristics listed above are suitably present in GCT.

- i) GCT is a great and growing centre of population, economic activity, wealth, etc:

South Africa has a great need for the type of services traditionally provided by local authorities. The metropolitan areas are not only the areas of most rapid growth, but they are the areas where the populaces' expectations are highest. Very special care and attention must therefore be devoted to the organisation for local authority services provision in these areas. Browne identified -

- five metropolitan core cities (Johannesburg, Cape Town, Durban, Pretoria and Port Elizabeth);
- 91 other "metro-link" and "metro-dependent" authorities.

These 96 local authorities constitute 19 per cent of the total number of local authorities in South Africa. However, in respect of all significant indicators, such as population, economic activity, wealth and expertise, the metropolitan areas' share of strength considerably exceeds this 19 per cent numerical proportion.

Some selected indicators follow, supported by data from Browne.

The total operating expenditure on the income accounts of general services and trading services, in the metropolitan core cities averaged at R150,9 million per annum (1976/1977 figure), compared to an arithmetic average for all local authorities of R3,6 million per annum. (1001)

A similar story is told by other indicators. An example is White, Coloured and Indian population: metro core cities house 40 per cent of the national total and metro areas 64 per cent of national total. White population alone is as striking; respective figures are 35 and 63 per cent. (1002)

TABLE 10.1.2A

THE IMPORTANCE OF METROPOLITAN AREAS IN SOUTH AFRICA,
AND OF GREATER CAPE TOWN (1003)

	Metro core cities	Metro areas	All local authorities	City of Cape Town	GCT
	per cent	per cent	per cent	per cent	per cent
Number of authorities	1	19	100	1/5	4
White, Coloured and Indian population	40	64	100	9	19
White population	35	63	100	5	11
Operating expenditure on general services	46	68	100	6	13
Operating expenditure on trading services	52	70	100	7	12
Capital expenditure (including housing)	36	65	100	15	22

(Note Browne's commentary on why the core cities' share of capital expenditure (including housing) is, at 36 per cent, lower than that for general services (46 per cent) and trading services (52 per cent), but the share of the metro areas as a whole is little inferior (65, 68 and 70 per cent respectively). In short, "the 'need' for capital expenditure in the case of the metro-dependent authorities is clearly greater", especially on housing. (1004))

GCT itself is in every respect the second-ranking metropolitan area of the nation. The population of the area has grown from 0,30 million in 1927 to 1,83 million in 1980; it is estimated that this latter figure will double by 2010. The total operating expenditure of general services and trading services exceeded R300 million in 1980.

Note also that the intensive housing effort boosted CCC's and GCT's capital expenditure proportion higher than their proportions for the other indices such as population or operating expenditure.

It is concluded that GCT is in respect of size and relative importance in the nation a suitable case study for the thesis methodology.

- ii) GCT provides all the more typical (of metropolitan areas of the world) services (and especially engineering services). Problems (of one degree or another) of shortfalls in resources (especially finance), supply lagging demand, and fragmentation and overlapping of responsibilities, are evident:

In GCT the provision of local authority services is in many respects very satisfactory. Nevertheless many of the typical metropolitan service problems may be found.

These matters are described in greater depth in Section 10.2 below.

iii) GCT has a heterogeneous population:

GCT has a mixed and differentiated heterogeneous society. The percentage of Whites in GCT in 1980 was 31: this is expected to fall to 26 by the turn of the century. This reduction is due to the higher rates of growth (through natural increase and through immigration) of the Coloured and Black population groups in GCT.

The heterogeneity is definitely a disadvantage because, whatever compensating advantages there might be, the net effect of a heterogeneous population is the proliferation of opportunity for misunderstanding and suspicion between the races. Especially this is so if racial differences are correlated with other socio-economic characteristics, which is emphatically the case in Greater Cape Town.

Thus GCT is, in respect of its heterogeneity, a particularly suitable case study for the generalised methodology.

Services provision is concerned with the distribution of resources. Decisions on this distribution are intimately related to the consensus that can be achieved, among the groups wielding power, on the relative relief of the gap between need for and ability to provide services, which differently affects different groups. The existence of socio-cultural population heterogeneity increases the possibility of conflict.

Lijphart suggested a model for splitting the resolution of distribution issues among different tiers in areas of heterogeneity. At the topmost tier the number of issues and their content is reduced as far as possible, thus facilitating consensus. This method alleviates "the burdens of decision-making at [the topmost tier] and [contributes to] a lower probability of immobilism." (1005) This is very much the logic followed by proponents of separation of services responsibility in metropolitan areas into such divisions as "hard" and "soft" (Section 8.4.1.3 above), although the motivation in most of these instances has no necessary

relation to socio-cultural heterogeneity.

- (iv) The powers of local authorities in GCT are subject to encroachment by other governmental tiers:

This trend has been apparent for many years. (This remark applies to many countries, not only to South Africa.) That this is so was well documented in GCT reform. (1006)

Over the last few decades, provincial and central government involvement in local affairs has increased in Greater Cape Town, as it has in all the other urban areas of South Africa. The expanded use of conditional (qualified) financial assistance, the increased supervision especially in areas such as finance and planning, and statutory control over residential and industrial location, are all mechanisms which have reduced local autonomy and have increased central control. Although such control usually ensures that many services are provided to predetermined minimum standards where such standards were in many cases not previously attainable, that costs are more fairly apportioned, and that central government legislation is carried out, it does raise serious questions about the future of local authorities.

A recent example in GCT of creeping take-over by the Provincial Administration is the attempt to curb the Cape Metropolitan Planning Committee. (1007) An example of loss of a function to central government is the take-over, in terms of 1956 legislation, of further responsibility for regional water supplies. (1008) The second of these can be soundly motivated, the first cannot.

Morris put the case against encroachment as follows: "A central authority can usually assess more effectively the overall demands and needs of areas extending beyond local and regional boundaries, and it is undoubtedly better placed to establish an order of priorities governing major resources to satisfy national needs. But where problems of urban development are involved it is generally the urban authority - local or regional - in direct contact with John Citizen - who

is best placed to appreciate the urgency and immediacy of the problem, and certainly best able to deal with the more intimate details involved." (1009)

Recent pronouncements by central government spokesmen on the enhanced roles of local authorities in the new constitutional dispensation have given rise to hopes that some current trends may be reversed.

- v) It has been a long time since substantial change took place:

The local government system of Greater Cape Town is derived from an earlier age. The last major changes took place in 1913 and 1927 when most of the then existing small municipalities of the Cape Peninsula combined to form the present City of Cape Town. It would be surprising if, with the passing of more than half a century since the last change, and taking account of the growth in size and complexity of the area, substantial organisational changes are not needed.

The Council of the City of Cape Town has for some years recognised that suitable patterns of reform should be investigated.

The City's departmental heads on 1976-10-04 decided that the City Engineer would report on this matter in due course. "Then on 1979-03-15 the Executive Committee resolved that a report be submitted to it on the benefits and disadvantages, including political, which the establishment of a metropolitan-type development in Greater Cape Town would hold for the City, with particular reference as to how the needs of the City could be catered for." (1010)

- vi) There is a recent study available:

The quotation begun above, from GCT reform, continued: "Work accordingly commenced on this study in early 1980. An enormous amount of information was collected, sifted and analysed. ...

The report motivates reform and recommends the scope, responsibilities and possible constitution of a metropolitan tier of authority and its relationship to both upper and lower tier local authorities, especially to the latter." (1011)

This report is of the time of writing still being considered by the City Council. Because of its scope and far-reaching recommendations, it is requiring careful attention.

The report was researched and written by the author of the current thesis, guided by the City Engineer of Cape Town, Mr J G Brand. It is an extremely detailed, comprehensive and lengthy (estimated 600 000 words) consideration of the subject laid down in its brief.

The presence of this very recent report is a final reason why GCT is such a suitable area for case study examination of the methodology. Virtually all the basic research used in this thesis is drawn from GCT reform, although the form of presentation is, because of the differing needs, very different.

10.2 GREATER CAPE TOWN : SERVICES BACKGROUND, PROBLEMS AND ACHIEVEMENTS

Objective

The objective of Section 10.2 is to describe in summary fashion the provision of local authority services (especially engineering services) in Greater Cape Town. In respect of this, resources available, income and expenditure, arrangements for co-operation between authorities, the involvement of other tiers of government, and the opinion of other researchers and of practitioners are among the principal aspects described and discussed. Statistical data sets the background, illustrates and amplifies the discussion, and assists in the reaching of conclusions.

10.2.1 BACKGROUND

In 1980 there were 1,83 million persons in the metropolitan region,

of whom 57 per cent were Coloured, 31 per cent White, 11 per cent Black and 1 per cent Indian. By the year 2010 it is estimated that this population will have doubled and that the Whites will have shown a relative decline in percentage compared to the other races. (1012) Seventyfive per cent of the population is urban.

It is conservatively estimated that the annual population growth rate of the Non-White groups will in the present decade average 3,0 per cent, a figure much higher than that of Whites (1,8 per cent). Although this is a slower rate of growth for the Non-Whites compared to that which pertained between 1960 and 1970 (the Coloured population increased then at just under 4,0 per cent per annum), the Non-White growth rate remains high. Unfortunately it is the poorest section, with a relatively low standard of living at present, which is increasing the fastest; sheer weight of numbers might worsen average standards in future, unless there are large and disproportionate investments in land, housing, facilities and infrastructure, and the creation of new jobs and retraining of existing workers for improved work opportunities.

The City of Cape Town itself has about half the population of Greater Cape Town (49,5 per cent if Blacks are excluded. (1013) It also accounts for about half of the rates, general and trading surplus income (49,4 per cent), or more than half (57,8 per cent) if account is taken of that part of the income of divisional councils which is derived from the municipal area. (1014)

10.2.2 PROBLEMS AND ACHIEVEMENTS

10.2.2.1 Crisis?

There is no general "crisis" in local authority services provision in Greater Cape Town. In fact, provision appears to be quite satisfactory in comparison with that of many other metropolitan areas. However the absence of crisis should not be taken to mean that GCT has no problems that require attention.

There is room for substantial improvement in the present forms of organisation for the provision of local authority services. The inadequacies are principally lack of clarity of responsibility,

financial shortages, a less than sufficient degree of community participation and representation, and obstacles to efficient and effective performance of the service provision function. These are the predictable difficulties of any multiple authority organisation which has become as large and complex as Greater Cape Town has. These difficulties have developed over a long period of time.

Unless rectified, the inadequacies which have arisen will inhibit the ability of the authorities to cope with the metropolitan area's present and future circumstances. (This point is elaborated on in Section 10.2.2.3 below.)

These remarks apply as much, or more, to engineering services as to any other services.

10.2.2.2 Present practice summarised

The City of Cape Town (CCC) and to a lesser extent the Divisional Council of the Cape (DCC) act in GCT as the metropolitan suppliers of certain services. In respect of some of the services this is to some of the local authorities only; there are local authorities which maintain full or partial independence of services provision. Furthermore, by inter-authority agreement, CCC acts as the "core city" for certain tasks. CCC also administers on behalf of all the local authorities a number of other metropolitan-scale services. There are several examples of agency or delegation.

Existing jurisdictional boundaries in several instances give rise to a separation of interest where, in fact, there is a community of interest. Many examples of this can be found, for example a drainage scheme which is figuratively bogged down because the catchment is shared between several local authorities and no agreement can be reached on financial responsibility for the necessary action.

Some of the existing local authorities, especially the smaller ones, have financial problems and consequent difficulty in providing the minimum satisfactory range of services.

Central government involvement in services production is of great significance especially in respect of the exploitation of water catchments and the funding of many services. Many inter-authority joint committees give attention to a variety of necessary matters. Private enterprise exercises a number of functions on behalf of local authorities.

10.2.2.3 Present practice in more detail, and problems noted

The existing GCT responsibilities for local authority services, especially those of a metropolitan nature, were described in detail, with relevant comments, in GCT reform under the sub-heading of each service. (1015)

There is a long-standing argument that the increasing metropolitan population and the complexity and cost of the services to be provided demand a review of existing jurisdictional boundaries. It has variously been claimed in GCT that -

- there are too many local authorities;
- some local authorities do not accept a fair share of responsibility for the provision of regional services;
- the smaller local authorities ought to have more say in the metropolitan services operated by the larger local authorities;
- co-ordination between the actions of the various overlapping local authorities, provincial and central government departments, and other services authorities, could be improved; and
- there is increasing intrusion by central and provincial government in local affairs; admittedly, often for good reason.

Greater Cape Town, like metropolitan areas in other parts of South Africa, and indeed elsewhere in the world, is affected by inadequacy of income, in both the long- and the short-term, to meet development and maintenance needs. It is increasingly important to reduce costs, to improve the efficiency of service systems and to avoid duplication of effort. Well-argued fears have been voiced that the potential of the traditional income sources is inadequate, and that new sources of income must be sought.

There are differences from the one local authority to the other of both revenue resources and of the provision of many urban services. Furthermore, the income of local authorities is out of balance with the spatial distribution of the areas where expenditure must be made to cater for the needs of the citizens. For example, many of the people who work in the City of Cape Town or use its facilities do not pay any rates income directly to the City. Similarly, most of the consumer expenditure of people on the Cape Flats is made in shopping areas which, if independent local authorities were demarcated on the Cape Flats, would not fall within their boundaries. Hence there would be a steady drain of wealth from authorities based on the Cape Flats residential areas to the other authorities where the opportunities exist for consumer spending.

Many major services are already being provided in the metropolitan areas, under inter-authority agreement, by one or two authorities on behalf of most if not all authorities. For example, in GCT the bulk supply of nearly all treated water is the responsibility of CCC. Health services for most of the metropolitan area on the lower tier are shared between CCC and DCC. Responsibility for electricity generation and reticulation is, again for most of the metropolitan area, shared between ESCOM and CCC.

This co-ordination of the services allows for better long-term planning of resources, efficiencies in design of the whole of the distribution system, automation where possible with resultant staff savings, and a general continuing improvement in the standard of service provided. Despite this there are still many examples of duplication and overlapping of urban services; these should be eliminated as far as possible.

The two GCT services selected for purposes of very brief illustration are for comparative and continuity reasons the same as those described in Section 7.4 above, viz. sewerage and wastewater treatment and transport planning.

- i) GCT's sewerage and wastewater treatment system is much influenced by the variety of topographical and soil conditions encountered, particularly on the Cape Flats, with its high water table, flat gradients and wind-blown sand.

Each local authority is responsible for its own reticulation and indeed for all trunk mains within its area.

Virtually all of the urban area of GCT is sewered. In CCC, a programme is presently well advanced to separate treatment of domestic wastewater from industrial; a major reason for this is the planned reclamation of wastewater for reuse.

Most of the local authorities operate wastewater treatment works; the others have made agreements for their wastewater to be treated by those local authorities which have the capacity to do so. Capacity is, with the exception of two or three local authorities, adequate for the foreseeable future. Developments have roughly followed the recommendations of a regional effluent treatment plan which was published on behalf of the CPA in 1971. However there has been less consolidation of treatment facilities than that suggested in the plan, because, among other reasons, costs of conveyance from one small local authority to another have in some instances proved higher than projected savings in costs of local treatment.

Problems have, due to the divisive factor of separate local authorities, arisen in the past of missed opportunities for the exploitation of economies of scale in treatment, of less-than-optimum location of sewerage facilities, and of delayed or abnormally costly facilities. For example, local authority jurisdictional boundaries have usually corresponded only by coincidence with natural watersheds. This has often determined that sewerage networks have not been constructed most economically. The danger exists that similar waste will arise again.

The cost function characteristics for which local evidence can be found are generally supportive of the conclusions drawn from the studies elsewhere (i.e. as related in Section 7.4.2.4).

Central government's periodic disregard of local planning constraints has caused some problems.

(The above is a very brief summary of the relevant pages in GCT reform. (1016))

- ii) Secondly, transport planning is dealt with.

In GCT the potential exists for a very rapid increase in car usage. Consequently the load on the highway system could rapidly increase, causing a complete breakdown, unless public transport is very much improved.

Suburban rail services are operated by SATS and suburban bus services are operated by a number of bus companies which are all part of the same privately owned group. Together, these provide arguably the best public transport service of any metropolitan area in South Africa. The service is undoubtedly technically efficient; but Theron described it as falling short in social effectiveness. In 1980, acute criticism, escalating to civic unrest, followed bus fares increases and a clampdown on paratransit.

It was clear for some time that there was a need for a body to co-ordinate on a metropolitan scale all forms of transport and land use and to ensure the timeous provision of transport facilities. The Urban Transport Act of 1977 has in South Africa provided for this. A Metropolitan Transport Advisory Board (MTAB), with membership drawn from all three tiers of government, has been functioning in GCT since 1980. The core city (Cape Town) is responsible, in consultation with the other local authorities and with various other interested parties, for drawing up a transport plan. The plan is annually reviewed.

New financing methods need to be explored. Subsidies of the public transport user rather than of the operator have been suggested.

A number of boundary anomalies exist.

There is merit in trying to plan future development so as to attain the objective of reducing travel time and unnecessary delays. Closer co-ordination with urban development of all forms of transport is the responsibility of a multitude of local and other authorities.

The cost function characteristics for which local evidence can be found are generally supportive of the conclusions drawn from the studies elsewhere (i.e. as related in Section 7.4.3.4).

(The above is a very brief summary of the relevant pages in GCT reform. (1017))

Transport planning and sewerage and wastewater treatment are both infrastructural services that should be provided simultaneously with the construction and occupation of new housing. It is therefore important to note that, although some of the local authorities in GCT have provided central government-funded housing in their areas, a large backlog of inadequately housed persons remains. This is partly due to a lack of co-ordination between the various authorities. It has been alleged that an unfair burden is placed on some of the local authorities in respect of the provision of housing for the lower income groups. On the other hand, some local authorities are in no position to provide housing for groups other than White, simply because they do not have declared Non-White group areas within their boundaries.

10.2.2.4 The need to build on the lessons of the successes in present practice

Various methods have in GCT evolved for the performance of local authority services, whether these services be of strictly parochial concern or of metropolitan-wide concern. Some of the arrangements have been outstandingly successful and are viewed as most satisfactory by all the local authorities concerned.

An important part of the research of GCT reform was the compilation of an exhaustive listing, with some statistics to give an idea of size and of scope, of every example of regular and irregular inter-authority co-operation of any significance within Greater Cape Town. Some of the best examples in respect of engineering services are -

- the Cape Metropolitan Planning Committee, a forum, attended by almost all the authorities in the metropolitan area, for broad-scale planning;

- the conceptually similar Cape Town Metropolitan Transport Advisory Board, concerned with transport affairs;
- the role of CCC, in association with the central government's Directorate of Water Affairs in respect of some dams and major water conveyance, as a metropolitan supplier of treated water in bulk to almost all local authorities;
- the responsibility of CCC in some instances and ESCOM in other instances for the generation of electricity, and very often the reticulation thereof as well, to all local authorities;
- the role of CCC and DCC as the suppliers of most of the housing and associated amenities and engineering infrastructure for the lower income groups of the entire metropolitan area;
- the agreements between CCC and DCC and other local authorities for wastewater treatment and solid wastes disposal; and
- ad hoc arrangements between authorities for the passage of stormwater, sewerage, etc. over each other's land.

An important type of inter-authority co-operation is the joint sponsorship of facilities by the Cape Provincial Administration (CPA), central government or other governmental agencies. For example, the involvement of CPA in -

- subsidisation of primary roads;
- co-ordination of solid wastes disposal planning;
- town planning approvals; and
- subsidisation of the capital expenditure on beach and beachfront activities, nature reserves and other regional recreational facilities.

Of the involvement by quasi-government organisations, that of ESCOM, Post and Telecommunications and of SATS is of special importance to the provision of local authority engineering services. Mention must also be made, on the private enterprise side, of the City Tramways group as the almost exclusive provider of commuter bus services.

It is upon the presently operating instances of successful inter-authority co-operation that any new services provision forms must be structured. It will be necessary to disturb some of these successful arrangements in the interests of further improving their performance. This improvement must be seen not necessarily from the point of view of a single service but from the point of view of all

services of a similar scale and areal concern. For example, successful as some inter-authority arrangements for single services might be, a way must be found of broadening that inter-authority co-operation to include several other services under unified multiservice control.

The above remark highlights GCT's greatest deficiency at present, viz. the lack of formal arrangements for co-ordination of the services which are clearly of concern to the whole metropolitan area but which are operated by different authorities.

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11 CASE STUDY : GREATER CAPE TOWN :
PRELIMINARY CONCLUSIONS : THE
EFFICIENCY AND EFFECTIVENESS
CRITERION ONLY

University of Cape Town

11.1 EVIDENCE

- 11.1.1 Individual services
- 11.1.2 Grouping of services
- 11.1.3 Judgement

11.2 BASIC APPROACHES TO IMPROVEMENT

- 11.2.1 Two tiers
- 11.2.2 Appropriate service areas
- 11.2.3 Discarded alternatives
- 11.2.4 Conclusion

Chapter objective

The objective of this chapter is to demonstrate, in the case study area, the third step of the thesis methodology. This involves a blending of the information obtained in the first step with information (screened for relevance) from the second step. Only the efficiency and effectiveness criterion applies. The tentative conclusions, which are then drawn, are an attempt at a distillation of the best of the available reported experience, but redesigned for local circumstances.

11.1 EVIDENCE

11.1.1 INDIVIDUAL SERVICES

An extensive literature survey of relevant material on local authority services provision elsewhere than in GCT was in GCT reform undertaken in order to discover evidence of potential use to the achievement of that report's objectives. An even more comprehensive study was then undertaken of local authority services provision in GCT. The purpose of this latter study was firstly to discover if independent evidence could be found of the same phenomena which were reported in the literature survey, secondly to assess to what extent the findings of the literature survey were applicable to GCT, and thirdly to assemble other pertinent evidence from within GCT.

The collection, recording and assessment of this material took up the bulk (Chapters 7 and 9) of GCT reform. Material was recorded service by service.

Evidence, ranging from convincing to ambiguous, was obtained for each service facet in respect of economies or diseconomies of scale, economies or diseconomies of contiguity, and other factors relevant to efficiency and effectiveness. Assessment of the comparability of the circumstances under which the studies reported in the literature survey were done to circumstances in the case study area, was an important part of the process of vetting the evidence with a view to accepting, modifying or rejecting it.

It is perceived that all services are, over some part of their performance versus scale spectrum, subject to economies of scale, and over some other part are subject to diseconomies of scale. The question then to be asked is: over the scale range expected of this service in GCT, what are the performance characteristics of the service? What happens above or below this range is not as important. A service may have economies of scale up to a very small catchment size, and thereafter diseconomies; another may have continuously rising economies of scale up to provincial or even national level.

Again, sewerage and wastewater treatment and transport planning may be the examples briefly described:

- i) Economies of scale are found in most components of all common sewerage and wastewater treatment systems. These findings are reported in several studies, overseas and South African. There seems generally to be a steep fall in construction and operation cost, per capita, of works which serve 1 000 to 20 000 people, then a lesser fall to those which serve 200 000 people, then a slow fall to works which serve a million or more. GCT figures tend to confirm this. Reclamation of wastewater is also susceptible to economies of scale. However wastewater treatment is characterised by diminishing returns of investment. Hence, if the purpose of the increase in the size of a treatment unit is solely to produce a more highly treated material it will be found that the unit cost will increase.

Several references therefore call upon small local authorities to negotiate with larger authorities for the treatment of their wastewater; it is claimed that they stand to gain financially. Two or more local authorities joining forces may bring down the unit cost of both, and the total cost of the scheme, works plus conveyance, may reduce. It may be, though, that the costs of conveying wastewater to the larger's works would swamp any other cost advantage. An incentive to a combined scheme, to offset an apparent disadvantage in terms of cost to each local authority separately, may be the prospect of being able to afford a higher standard of maintenance and operation.

Neighbouring local authorities should have compatible standards: pollution and flooding have well-documented externalities.

Planning of the service must without question take place at the metropolitan level. The advantages of integrated catchment planning, irrespective of jurisdictional boundaries, are generally acknowledged and this planning has been practised in GCT up to a point.

Real and social costs of major pollution should be thrown onto the polluter - this is not always done.

- ii) The immediate aim of transport planning is to improve general accessibility, but sight should not be lost of the role which the transport planner can play in reducing the need for travel.

Comparisons of the service between urban areas are much affected by factors such as the urban form and the prosperity of the inhabitants.

Transport planning must without question take place at the metropolitan level.

Economies of scale in public transport operation and the advantages of unified control are in principle not disputed. What is not known is the point at which the rate of increase in these advantages with population (or with any other suitable independent variable) becomes insignificant. However, it is in Western countries generally, but not universally, accepted that, for convenience of operation, the smallest practicable unit for administration of the public transport service is the metropolitan area. In the Third World, however, transport monopolies are the exception; most people depend on "paratransit" (jitneys, taxis etc).

Parts of certain functions, such as parking control, may be devolved to more local administration if this is considered desirable for community reasons. Not so traffic control and the provision of major parking and transport interchange facilities - these are best exercised by a metropolitan tier.

11.1.2 GROUPING OF SERVICES

GCT reform found that a large group of services, or facets of services, must in a metropolitan area be performed on a metropolitan basis; there is no sensible alternative. This is the result of the presence of not only economies of scale but economies of-

- specialisation,
- unified control and
- contiguity,

and also by the need to find a way of resolving the substantial externalities which would arise were the service in question

performed by a number of physically adjacent but administratively separate local authorities.

A second large group of services or facets of services has reasonable evidence of economies of scale at substantial sizes of population served.

A third group also shows economies of scale but these are accompanied by non-economic disbenefits which militate against the effective rendering of the service to the population of the local area. A satisfactory compromise is generally achievable by the centralised control and administration of decentralised facilities in dispersed locations so as to offer what is generally regarded as reasonable access to the users.

A fourth group of a small number of facilities shows diseconomies of scale at the normal unit size demanded in all but the very smallest local authority.

It is noted that population, used as the independent variable in this study, is not always the most valid independent variable, but it is the only variable which permits comparison between services.

It is also noted that listings of this type are often prisoners of the organisational structure in the context of which they were done. The projection of evidence to a new organisational structure is thus subject to some uncertainty. However the greatest care was taken, in the GCT reform equivalent of the third step of the thesis methodology, to check the local relevance of material obtained elsewhere. Thus the listing deserves substantial credibility.

In conformity with the emphasis of this thesis, only the services with direct engineering relationship are listed here, in the four groups, in Annexures 11.1.2A through 11.1.2D. (1101)

A comparison of the listing of Annexures 11.1.2A through 11.1.2D with the original shows that the engineering services exhibit economies of scale generally extending to a greater population size than do other services. (See also Section 12.2 which follows.)

In GCT reform, not only were the characteristics of individual services carefully investigated, but the presence of links and externalities between services and the practicability of alternative groupings were identified and assessed. (Paraphrased in thesis in Section 8.2.4.2. (1102))

The systems nature of the topic dictates that the provision of individual services (engineering or otherwise) cannot be divorced from similar considerations of other services.

GCT reform concluded that, as in many other metropolitan areas, provision of local authority services could in GCT be improved were there a more rational organisation for the provision of these services. This would involve a metropolitan-wide approach to the provision of selected services, and a local approach in respect of others.

11.1.3 JUDGEMENT

GCT reform had the specific objective of formulating an alternative local authority services provision organisation for GCT.

The decision on an appropriate location of responsibility for each facet of each local authority service in GCT depended upon a judicious assessment of the advantages of size as opposed to the advantages of decentralisation, and links with other services. Those services needed to be identified -

- which were sufficiently standardised and/or sufficiently free of local possessiveness to justify centralised production if economies of scale so warranted, as opposed to those
- which were not sufficiently standardised, not free of local possessiveness and not susceptible to economies of scale.

Selecting the best organisational structure and allocation of appropriate level of responsibility followed a clear definition of needs, of the work to be done and of the resources required to do it; not the other way around. Form must follow function.

In making decisions as to how the services should be grouped together for performance by local authorities, and which local

authorities should be responsible for each of them, certain value judgments were needed. These are listed in Section 5.2 above.

Not only do many engineering services enjoy economies of scale to a great population size, but their standard of performance is generally agreed within quite close limits. Hence many (but by no means all) engineering services are in GCT very suitable for provision by a metro-wide authority.

The search for an organisational structure suitable for the particular needs of Greater Cape Town involved two important considerations. Firstly, how are tasks and functions to be allocated to authorities? Secondly, how can operating authorities within the metropolitan region be organised and co-ordinated? These two considerations, individual authority scope and inter-authority relations, are closely interrelated.

11.2 BASIC APPROACHES TO IMPROVEMENT

11.2.1 TWO TIERS

The principal purpose of any local authority is to provide the infrastructural and associated services which are a basis for the sustained development of the local community and its economy. Also, in all of its operations, it must be as far as possible efficient, effective and representative, and it must operate within a realistic budget. (Section 8.3.3.1.)

In GCT, changes are needed to get on top of, as only inter-authority action could do, a range of problems of metropolitan services provision. Achieving this would, inter alia, require that there be a co-ordination and rationalisation of the independent joint committees and umbrella authorities which are presently proliferating.

The careful analysis by GCT reform of each service in GCT gave rise to the conclusion that it would be highly desirable to create a metropolitan services authority and to divide responsibility for the performance of the services, presently provided by the existing local authorities in GCT, between the two tiers. This was

accordingly recommended.

"Recommendation 1: That a metropolitan services authority be created in Greater Cape Town. That responsibility for the performance of the local government services presently mostly provided by the existing local government units in Greater Cape Town be distributed appropriately between the metropolitan tier and the lower tier of authorities." (1103)

It was envisaged that the upper tier would cover the whole metropolitan area in respect of specified services. The lower tier authorities would have a population of a sub-metropolitan size; research indicated certain convenient sizes for services authorities. Their actual size and boundary determination would inter alia depend on geography, physical contiguity, affinity, mutual assistance potential and local tradition including the present existence of local government. Agency, delegation and other co-operative agreements at this lower tier could in the interim permit the achievement of optimum size (in the performance of the appropriate range of services) for each service without sacrificing existing independence, were this thought to be important locally.

All metropolitan-scale services would therefore be provided by an authority of an appropriate or near-to-appropriate size. Thus the major objective of a rationalisation would be achieved.

The lower tier would afford scope for -

- greater community participation; and
- authorities with different incomes and priorities to adopt different expenditure options (within limits) on the services which would remain within their control.

A reasonably close approximation of the best of all worlds could be achieved.

Options must be limited to allow for the externalities which any service has, to a greater or lesser extent. For example, if a lower tier authority allowed its sewerage to degenerate to the state of being a public health hazard, this would have repercussions beyond that local authority's boundaries. Therefore those services

allocated to the lower tier must be those for which any adverse effects of externalities can be kept within reason.

11.2.2 APPROPRIATE SERVICE AREAS

The identification of appropriate areas of responsibility for each service is critical. Some services are most sensibly assigned in their entirety to one or other tier. Others are best split, on an arterial/local basis, or on a supervisor/subordinate basis, with some facets being allocated to one tier and the balance to the other. A good example of an arterial/local split is road policy planning, construction and operation, where the upper tier is responsible for primary roads on the basis of a metropolitan-wide programme, while the lower tier municipalities deal with secondary and tertiary roads in response to local priorities. Secondary and tertiary roads would be subject to metropolitan definition of minimum and maximum performance limits, which definition is itself an example of the supervisor/subordinate split.

The metropolitan area is, for example, a more sensible jurisdiction for the administration of mass transportation than is a single local authority, because citizens from all over the metropolitan area use the service, frequently crossing local boundaries. Similarly, the planning of solid wastes disposal would meet with greater success if it were co-ordinated on a metropolitan basis, so that the advantages and disadvantages of the restricted number of possible locations within the metropolitan area for pulverising and disposal could be taken into account.

Air pollution control is another measure which, if it is to succeed, could hardly be confined within the boundaries of a single local authority. It would have effects extending beyond its boundaries and would in turn be influenced by activities in other local authorities in the metropolitan area.

The construction of new public housing is another service which must be co-ordinated and largely operated at a metropolitan tier. Especially this is so as long as different local authorities have different amounts of land available and are restricted by group areas legislation in respect of whom they can house. Also, a

rational housing plan and programme cannot be drawn up without close attention to the links of the people to be housed with topics of metropolitan concern such as employment opportunity, transport facilities, land drainage and wastewater treatment, and regional community facilities and amenities.

Similarly, a group of services which depend to a large extent for their operation on the laws of hydraulics find their most economic pattern, at least in respect of their bulk reticulation and supply or treatment, in a relationship rather to drainage basins than to statutory boundaries. These services are best co-ordinated and largely operated at the metropolitan tier.

On the other hand, matters which are more appropriately the concern of lower tier local authorities include most aspects of building development control, local planning, the provision and maintenance of local community and recreation facilities and the maintenance of housing, secondary and tertiary roads and drainage reticulation. The metropolitan tier is not correct for the making of detailed decisions on local parks, for instance, or on the surfacing of sidewalks.

It is apparent that the present pattern in GCT of local authority boundaries and powers, partly the result of historical factors no longer pertinent, must be replaced by a more rational approach.

It is very convenient that most of the services identified, by reason of their scale performance characteristics, as suitable for allocation to the upper tier, are of the "service function" or "hard" type. Similarly, those of a more local performance scale coincide, generally speaking, with those classed as of the "governmental function", or "soft" type. (Section 8.4.1.3 above, and Section 12.3.1 below.) No irreconcilable differences exist between the two classifications of "performance with scale", and "function".

GCT reform argued that, in GCT, were there the two tiers proposed in its Recommendation 1, the metropolitan services authority could be just a controlling body. An organiser and setter of policies and standards, it would employ other agencies of the appropriate size to

exploit scale economies and to perform the required services. Alternatively the authority could be not just a controlling body but a direct employer of staff which would execute the metropolitan-scale tasks.

GCT reform concluded however that the former could only be a more ineffective alternative. The metropolitan services authority must be more than a controlling body; it must be an executive body in order to fully exploit the advantages of efficiency and effectiveness available to action at the metropolitan scale.

Hence : "Recommendation 2: That the metropolitan services authority be a direct employer of an appropriate range of staff, and not just a controlling body." (1104)

The Industrial Development Corporation, and therefore by implication the President's Council, expressed sentiments similar to those of GCT reform's first two recommendations.

"It must be concluded that the larger cities in South Africa are the centres of metropolitan areas in all but name. They have reached the stage where planning and the provision of services must, in the interest of economy, be provided on a metropolitan or regional basis. It makes no sense to cling to outmoded arbitrary boundaries where joint action by a number of independent authorities make effective speedy action extremely difficult if not impossible.

It is equally obvious that the basic concepts of good management call for a body with requisite powers to decide, to act, and the financial power to implement the decisions." (1105)

It was envisaged by GCT reform that the proposed metropolitan services authority should take over a number of roles played by agencies outside the present local government tier. For example, the co-ordinating role and in some instances the providing role played in respect of several services by CPA, and electricity distribution in certain areas where ESCOM has indicated its willingness to part with this responsibility, should both be allocated to the metropolitan authority. Simultaneously, the possibility should be investigated of some central government

functions being delegated to the metropolitan services authority.

The metropolitan authority, irrespective of whether it is a services authority or a form of government (for a brief elaboration see the fourth and fifth studies of Chapter 13), would have in many ways more extensive powers than present-day local authorities. It would derive these powers partly from the existing local authorities and partly from the CPA. In the light of the thus diminished responsibility within GCT of the provincial tier, the metropolitan authority could well replace the Provincial Administration within the boundaries of GCT. (1106)

With minor exceptions, all the foregoing recommendations were motivated by efficiency and effectiveness alone. Further on in GCT reform (and as described in Chapter 12 of this thesis) it was shown that other criteria reinforce the motivation for the implementation of the above recommendations.

11.2.3 DISCARDED ALTERNATIVES

Alternative methods for the rationalisation of the present local authority services function in Greater Cape Town were, GCT reform concluded, inferior in sufficient disqualifying respects to the recommended two-tier system. The principal alternatives considered were as follows:

Independent one-service authorities, such as the water boards and sewerage boards advocated by Stallebrass and others, have two serious drawbacks. Firstly, it is difficult to co-ordinate the work of each body with related activities carried out by other bodies. Secondly these authorities lack local accountability unless they are created by the local authorities, report to them, are financially responsible to them, are co-ordinated by them, and can be disbanded by them.

The performance by private enterprise of local authority services is an option only in respect of selected facets of services in restricted circumstances.

A third alternative is the total amalgamation of all local

authorities in the metropolitan area. This is inappropriate in GCT. That this was the approach adopted in 1913 and 1927 is not relevant : the scale of the area served has changed completely. A single authority would be too large and impersonal to suit the tastes and conditions of the people in the different local areas, and would inhibit community participation.

A fourth alternative is the provision by the core city (in the GCT case, the City of Cape Town) of the metropolitan-scale services for the whole of GCT. In respect of many services functions in GCT, the City of Cape Town does at present act as a metropolitan authority. However this is essentially a device which has grown over the years and has its roots in historical circumstances no longer applicable if a complete rationalisation is to be achieved. It is an attempt to gain some of the advantages of metropolitan services provision, but it is an expedient only. It certainly does not strengthen local government in the metropolitan area, as the areas outside the City are inadequately represented in decision-making in respect of the services concerned.

A fifth alternative is a form of voluntary co-operation on a highly organised basis. This would seek to obtain the mutual benefits which have been shown to arise from such a co-operation, but with the emphasis on voluntary agreement rather than coercion and without any large-scale reorganisation of local authorities. This, like the fourth alternative, is an expedient only. It can (and does in GCT in several instances) work on a piecemeal basis where -

- short- to medium-term benefits can be expressed quantitatively and are evident to all parties;
- the arrangement results in no significant loss of independence to any local authority; and
- there is not much scope for disagreement about the standard of provision.

However if all three of the above are not simultaneously present, voluntary arrangements do not work. Hence the only way to ensure action in respect of all issues in the interest of what is perceived to be of metropolitan net benefit is a metropolitan tier of authority with control over the full range of appropriate facets of services.

A sixth alternative might be to place the Provincial Administration in a position of control over the facets of services that it perceives to be in the metropolitan interest. It has at present the power of intervention in or plays a role in respect of a few services only. This alternative is clearly inferior to placing this power with the metropolitan tier. Local government in the metropolitan area would be severely harmed were its most critical services powers removed to the relatively remote provincial tier.

11.2.4 CONCLUSION

Thus GCT reform concluded, basing its statement at that stage on the efficiency and effectiveness criterion only, that it "may with justification be stated" that the arguments for a two-tier organisation for local authority services provision are "... overwhelming. There are substantial advantages in establishing a major authority for the planning, co-ordination and operation of metropolitan-scale functions, while leaving all the local services to a lower tier of authorities. Only by such a system is it possible for the lower tier authorities to retain their institutional identity and community life whilst gaining substantial advantages in the planning, co-ordination and operation of metropolitan functions." (1107)

Although Annexures 11.1.2A through 11.1.2D list only services with a direct engineering relationship, the conclusion quoted above results from an analysis which fully took into account the wider systems nature of the GCT range of local authority services.

ANNEXURE 11.1.2A

SERVICES (OR FACETS OF SERVICES) THE SUPPLY OF WHICH
IS ONLY FEASIBLE ON A METROPOLITAN OR WIDER BASIS

Air pollution control policy, planning and financial responsibility.

Public housing policy, and responsibility for (including financial responsibility). (Questions which need to be resolved at this tier include deciding on the physical location of public housing.)

Land drainage trunks, sewerage trunks and wastewater treatment policy, planning and financial responsibility.

Metropolitan development : strategic planning and physical planning aspects.

Primary roads policy, planning and financial responsibility.

Solid wastes disposal policy and planning and financial responsibility.

Transport policy, planning and financial responsibility.

Water catchment, major storage and treatment policy, planning and financial responsibility. (Water catchment matters have concerns reaching well outside the metropolitan area.)

ANNEXURE 11.1.2B

SERVICES (OR FACETS OF SERVICES) THE SUPPLY OF WHICH
IS SUBJECT TO ECONOMIES OF SCALE AT SUBSTANTIAL
SIZES OF POPULATION SERVED

(A note is made of optimum points where these have been identified in studies.)

Electricity generation : national scale.

Electricity reticulation : policy, planning, design, construction and maintenance: economies continue above 160 000 population.

Public housing construction : the metropolitan level permits big contracts and permanent design teams of a high standard of expertise.

Roads design, construction and maintenance : economies continue to the metropolitan level.

Land drainage trunks and sewerage trunks design, construction and maintenance : economies continue to the metropolitan level.

Land drainage and sewerage reticulation design, construction and maintenance : economies of scale not substantial above 50 000 population.

Wastewater treatment works design, construction and operation : economies, with inflections at 20 000 and 200 000 population; economies continue above this level. (In any exercise which considers increasing the scale of a works, the effect of conveyance cost on the overall economics should be included.)

Reclamation of wastewater : economies continue to the sub-metropolitan level.

Public transport operation : economies continue to the metropolitan level. Similarly major transport interchange construction and operation.

Solid wastes collection : optimum at 50 000 population. Also has economies of contiguity and exclusivity, as in any door-to-door service.

Solid wastes transfer and disposal (construction and operation) : pulverising plant optimum 200 000 to 250 000 population.

Solid wastes resource recovery : economies continue to the metropolitan level.

Water catchment, major storage and treatment design, construction and maintenance : economies continue to the metropolitan level.

Water trunks and reticulation design, construction and maintenance : economies continue to the metropolitan level.

Scientific services, architecture, mapping, mechanical engineering and certain other support services, especially computer facilities and a central data bank : economies continue to the metropolitan level.

ANNEXURE 11.1.2C

SERVICES (OR FACETS OF SERVICES) BEST SUPPLIED UNDER
CENTRALISED CONTROL BUT IN DECENTRALISED LOCATIONS

Planning, development control and other property-related matters : within the framework of a coarse-grained metropolitan plan, freedom of action for each local authority (or smaller unit, e.g. ward, if so decided).

ANNEXURE 11.1.2D

SERVICES (OR FACETS OF SERVICES) THE SUPPLY OF WHICH IS SUBJECT
TO DISECONOMIES OF SCALE ABOVE VERY SMALL SIZES OF POPULATION SERVED

Minor maintenance of public housing.

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12

CASE STUDY : GREATER CAPE TOWN :
FINAL CONCLUSIONS : ALL CRITERIA

University of Cape Town

12.1 INTRODUCTION

12.1.1 Implications to be checked

12.1.2 The effect on existing local authorities of a two-tier form

12.2 RECOMMENDATION : CENTREPIECE

12.3 REVIEW

12.3.1 Accommodation of community participation

12.3.2 Financial implications

12.3.3 Implementation

12.3.3.1 Required action

12.3.3.2 Is change worth the disruption?

12.4 CONCLUSION

Chapter objective

The objective of this chapter is to demonstrate, in the case study area, most of the fourth step of the thesis methodology. This involves a weighing of the efficiency and effectiveness criterion against the financial and community participation criteria, and a setting out of the optimum organisational form. A number of comments are made on implications of this form.

12.1 INTRODUCTION

12.1.1 IMPLICATIONS TO BE CHECKED

At the conclusion of the previous chapter it is noted that the arguments for a two-tier organisation for local authority services provision in the case study area, viz the metropolitan area of Greater Cape Town, are overwhelming.

Some of the implications of this need to be checked in detail before any decision to implement the organisation can be made. These implications relate particularly to -

- the effect on existing local authorities, and
- the finance of
- the community participation in and control of and
- the process of implementation of the new arrangements.

A checking of these implications is reported in this chapter.

Also in this chapter is reported in some detail the way in which it is recommended that the two tiers share responsibility for providing local authority services.

12.1.2 THE EFFECT ON EXISTING LOCAL AUTHORITIES OF A TWO-TIER FORM

Changes should not be made without good reason. Therefore, all things being equal, -

- existing services arrangements should be left undisturbed and
- existing local authorities should be left identifiable, even if their functions be attenuated.

Of these two, the first is easier to make pronouncements upon, because the situation of "all things being equal" in practice seldom occurs. This is the case even if two authorities (i.e. one at the metropolitan tier and one at the local tier), which could be alternative agencies for the provision of the same services, in theory have apparently equal advantage when that service is viewed in isolation. When the relationship of that service to other services is perceived, the advantage is usually, if the efficiency and effectiveness criterion only is considered, shifted towards the

metropolitan tier, with its scope for exploitation of wider advantage and the presence of less externalities. Hence those services which, when the total range of services is considered, are most sensibly allocated to the local tier, are either those in which considerations of local interest are paramount, or where difficulties of management are anticipated to arise from the sheer size of operation at the metropolitan tier.

Thus it is not considered that the argument in favour of the retention of services agreements, simply because they are presently in existence, should be a significant factor in the decision to which tier the responsibility for the service is eventually allocated. The advantages of allocation to one or other tier, when relationship to all services is considered, are usually of sufficient weight for it to be unlikely that the influence of the desire not to disturb existing arrangements would tip the scale either way.

Many lower tier local authority boundary adjustments could be motivated in the name of efficiency. One example of this would be a rationalisation of the serrated appearance of the boundary between Milnerton and Cape Town; the present boundary contributes to drainage and other difficulties. However it is recommended that detailed examination and extensive revision of local authority boundaries be postponed until there have been several years of successful operation of a metropolitan services authority. By that time it should be possible to make a far more rational delimitation than that which would necessarily be hindered by the newness and uncertainty of the reorganisation consequent upon the formation of a metropolitan services authority.

It might also be advisable in the future to amalgamate certain local authorities which prove to be too small to be practicably and economically viable. Amalgamations should be by voluntary mutual agreements and not be forced on local authorities. The attention of existing local authorities should be drawn to the advantages of selective amalgamation, so that they can make up their own minds on the issue.

12.2 RECOMMENDATION : CENTREPIECE

GCT reform gave prominence to what it referred to as "the centrepiece of the recommendations." (1201. This centrepiece is reproduced at the end of this chapter, for convenience, as Annexure 12.2A.) This shows the recommended division of services activities between the proposed metropolitan authority and the lower tier of authorities. All principal services are shown, not just engineering services.

This proposed subdivision will meet the dual objectives of firstly ensuring, if any organisational measure can, that area-wide functions are carried out efficiently and effectively, and secondly at the same time allowing for as much local autonomy as is reasonable. Some functions should be the exclusive responsibility of the proposed metropolitan services authority. Others should be the exclusive responsibility of the lower tier of authorities, or should be the responsibility of the lower tier subject only to the essential review function of the metropolitan services authority. Another type of relationship shown in the annexure caters for the instances where the responsibility must be shared between the two tiers; the arterial/local type of relationship is used for such services as roads and sewerage.

The case for adaptation rather than total change of the present form is found to have limited merit. Nothing is, all things considered, as satisfactory as the full reorganisation represented in Annexure 12.2A.

All local authorities, CCC and DCC in particular, will lose some functions were a metropolitan services authority established. Nevertheless the lower tier authorities will retain responsibility for numerous matters of a more local interest nature. The metropolitan authority would deal with major issues which are not peculiar to any local authority but are of common interest to all local authorities in the area. The creation of a metropolitan authority would not mean that individual local authorities would forfeit their present general autonomy, but they would lose specific responsibility for services which more rationally belong with the metropolitan tier.

It is clear that these innovations, made to improve the provision of local authority services in GCT, would involve an amended and probably diminished role of CPA in the metropolitan area. In fact, excepting only formal education, CPA could well emerge with little or no responsibility for services provision within GCT.

It must be stressed that the full benefit of the new organisation which is recommended will not come automatically from the structural change. How far its potential value will be realised must depend on the use made of it in practice by the citizens, the councillors whom they elect and the professional staff that are appointed.

12.3 REVIEW

12.3.1 ACCOMMODATION OF COMMUNITY PARTICIPATION

As it happens, most of the services listed in Annexures 11.1.2A and 11.1.2B fall into the category where general agreement on standards and methods exists. Although the application of these standards and distribution of the services is sometimes in dispute, the fact does remain that standards and policies receive general consent among the community. In many cases this consent is by default, in that the community very seldom expresses opinions on the performance of these services, but that is neither here nor there for the purpose of the present argument. Nearly all of the engineering services are in this category. Especially this is the case in respect of roads, sewerage and wastewater treatment, stormwater and electricity. As long as the residents are in possession of the basic service, they seldom express dissatisfaction.

When the services in these categories do evoke local emotion, this is usually in respect of particular applications in particular areas. There are exceptions, such as the widespread emotion in GCT during 1980 on the subject of increased public transport fares. When discontent does arise, far and away the two major concerns are public transport and public housing.

Generally the services in Annexures 11.1.2C and 11.1.2D, as well as certain non-engineering services such as the provision of recreation facilities and civic amenities, evoke a different set of responses.

Especially this is so in respect of local town planning and amenities issues; these are the staple diet of ratepayers' associations and community action groups. In the areas where most of the residents are local authority tenants, housing maintenance is another issue perceived as of great local importance.

Thus, most of the services which are subject to significant economies of scale are also those in which the other benefits of inter-authority co-operation are most apparent. Generally, they are services which do not permit of much styling to cater for local tastes. Similarly, they are usually subject to externalities in the sense that neglect of the minimum standard of performance by the one local authority can prejudice the interests of another local authority.

By contrast, those public services which permit and require product differentiation are those, generally speaking, for which constant or nearly constant unit costs of production with scale apply. They are also generally much less susceptible to externalities.

The recommendation of Annexure 12.2A is a very capable accommodation of, on the one hand, the advantages of scale and other economies, and on the other hand range of choice.

A necessary concomitant to any recommendation for the reform of services provision is some specification of the policy-making mechanism. A discussion of this mechanism lies outside the objectives of this thesis; Chapter 13 which follows merely sketches the questions which must necessarily be answered.

12.3.2 FINANCIAL IMPLICATIONS

As described in Section 8.3.2.2 above, it would be best, irrespective of locally-raised financial resources, for the local authorities at the lower tier to perform the range of services which efficiency, effectiveness and community participation criteria dictate should be the responsibility at this tier. To enable this, it may be necessary to make complementary transfer payments (subsidies) from the richer to the poorer areas in order to supply the anticipated shortfall of locally-incurred expenditure over locally-raised income; in addition, transfer payments should be

made by central government. This is far preferable to the "lowest common factor" alternative of withdrawing certain services from the planned distribution of responsibilities to the lower tier until most if not all the authorities of this tier were on paper able to balance their budgets. The optimum services provision forms should be set up and, within reason, financial arrangements should be made to make them work.

It is nevertheless possible to envisage that lower tier local authorities could within limits opt for reduced or in some other way different standards in respect of some of the facets of the services for which they would be responsible. That limits must be set, by the metropolitan authority or by unanimous agreement of the local authorities within the metropolitan area, is incontrovertible. It is in the interests of the whole of GCT that services to which significant externalities apply should be constructed and operated to minimum standards laid down on a metropolitan basis.

A reallocation of the financial resources which are presently available would be necessary to make the recommendations of Annexure 12.2A realisable.

Certainly, one of the first duties of a new metropolitan services authority, when it is established, must be to carry out a valuation, with uniform procedures and the same date of valuation, for all of the local authorities in GCT. Only if this is done will the necessary data base be available for decisions to be made, at a metropolitan tier, on the assessment rate precept load which will be required to finance metropolitan activities. The lower tier authorities could more efficiently collect the precept rate.

Agreement should be reached on a metropolitan basis on the following -

- the payment for capital assets transferred from the ownership of one authority to another;
- the valuation policy and uniform date of valuation;
- the distribution of the burden of financing the metropolitan services;
- the extent of the transfer payments which will, in addition to provincial and central government funds, be necessary to sustain

- operating expenditure on the local services in the poorer authorities of the lower tier; and
- the maximum and minimum standards of performance of lower tier services; these standards, in conjunction with each lower tier authority's financial resources, would determine the transfer payments necessary.

Lower tier local authorities would have the option of product differentiation through the expenditure of funds made available to the metropolitan pool by the central government and the richer authorities and transferred on an unconditional basis to them. They would also have the option of locally levying supplemental assessment rates.

Local authorities are increasingly dependent on funding from central government. It is sometimes convenient, sometimes necessary, sometimes both, to resort to revenue collection by higher tiers. This funding undoubtedly contributes to loss of local independence, because it is normally conditional. The advent of a metropolitan services authority should however create a climate for the greater and more confident giving by central government of general (unconditional) rather than specific (conditional) grants.

The operating budget of the proposed GCT metropolitan authority would approximate R200 million per annum at 1979 prices, and would require an assessment rates share of approximately R30 million. The balance of operating income would be received from central and provincial government grants and from payments for services rendered. (1202) The President's Council has suggested additional taxes that will assist the metropolitan authority's finances. (1203)

12.3.3 IMPLEMENTATION (1204)

12.3.3.1 Required action

There are three broad categories of required action associated with bringing into being the recommended organisational form.

Firstly, there needs to be public debate and acceptance of the proposals for change. The initiating of momentum for the cause of change in GCT is going to require a public debate in a wide forum.

Affected groups will need to be convinced that, whatever their demerits, the proposals are a vast improvement on the present form. (At the time of writing (December 1982) this debate had got under way with the release to the press, interested citizen bodies, and adjacent local authorities, of GCT reform and the commentaries on it by other departmental heads of CCC.)

Secondly, a decision is required on the timetable for the implementation of the recommendations which would finally be accepted. The recommendations must be refined. They must be debated and their acceptance or modification gained. The necessary legislation must be passed and elections held. Appointments to controlling bodies must be made, and the necessary resources assembled. Then the smooth take-over must be achieved. All this would, overseas experience suggests, require several years.

Thirdly, staff and facilities are required for the new authorities to function. As advocated in Section 8.4.4.1 above, two guidelines apply. Firstly there should be as much continuity as possible with present metropolitan-scale operations in GCT. Secondly there should be as speedy establishment of the new authorities as possible, in order to reduce to a minimum the extent of inevitable relative inefficiency and ineffectiveness during the change-over.

It is clear therefore that, rather than to start an establishment from scratch, it makes obvious sense to assemble a core of local personnel experienced in the relevant metropolitan-scale activities, and to build on that core.

An assessment of relative staff strengths between the existing local authorities revealed that CCC has a dominance in staff resources which is greater than pro rata to the share of units of municipal consumption (measured in tons of solid wastes produced or megalitres of wastewater or of water treated) or to the proportion of household numbers. This is largely reflective of the role which CCC at present plays in the provision of several metropolitan services.

From a purely practical point of view, therefore, it would seem that the simplest solution, in order to meet the criteria of continuity and speed, would be to build the new metropolitan services authority on the existing organisation of CCC. The existing CCC staff

functions would be split into two sections. From the one section would be created a new authority which would assume responsibility for most metropolitan services (which this section presently does, but under the CCC umbrella and integrated with all other existing CCC activities). The other section would assume responsibility for the services of the lower tier authority or authorities within the boundaries of what is presently the City of Cape Town.

DCC which, like CCC, has broad-ranging geographical interest in and service to the metropolitan area and a multipurpose nature, is not a candidate for the core role; its size and scope are small by comparison to CCC.

However, DCC, and some of the smaller local authorities, would be prime candidates to provide particular staff for particular responsibilities of a metropolitan nature. Portions of these other local authority organisations which would be taken over by the metropolitan services authority would include those portions which have responsibilities for the many inter-authority agreements providing services of a metropolitan scale. Examples come to mind of solid wastes disposal, emergency services, health, housing development, service reservoirs and water reticulation matters, and primary roads. A component of CPA (a small component relative to the total CPA establishment) would be a candidate for take-over by the metropolitan tier.

About half the present CCC staff works on services functions that it is recommended be allocated to the metropolitan tier. These staff would form the large majority of the staff resources of the new metropolitan authority.

The redeployment of staff will enable growing demands to be met with a smaller staff than would otherwise be necessary. The continuing expansion of most services will make groundless the fear that any significant numbers of people will have to leave local government as a result of reorganisation. Nevertheless the interests of staff must be fully protected in the reorganisation.

12.3.3.2 Is change worth the disruption?

From an apolitical point of view, the provision of local authority

services in GCT is in a by no means chaotic situation at present. The standard of performance is in many respects very satisfactory indeed. The drift of GCT reform is that a restructuring will be of undoubted great benefit. However the question arises whether the disruption which would inevitably accompany the implementation of change is in fact sufficiently insignificant that it does not act as a disincentive for change.

The benefits of change are clear, if as yet unquantified. The costs of change are unknown; only if these become known can the comparison between benefit and cost be made.

If the new authorities, especially the metropolitan authority itself, were as far as possible to establish themselves by simply incorporating portions of existing organisations, this would maintain the present momentum in the provision of services and would reduce the risk that the process of reorganisation might harm local government as a going concern. The costs of disruption would drop if the disruptions were kept to a minimum by the establishment of the metropolitan authority around the core of the appropriate CCC functions, simply amputated from CCC and suitably amended and restructured to suit their new roles.

During a transition period, both old and new would operate as far as the resources of each would permit.

It would appear from the available evidence that the costs of disruption would be minimal compared to the anticipated long-term benefits were the process of implementation recommended above adopted. However, were it decided to dissipate the CCC core of metropolitan services expertise, the one-time costs of change would be expected to rise and might prove a significant disincentive to change.

12.4 CONCLUSION

The optimum organisational form in GCT for local authority services provision, therefore, is that of a metropolitan services authority and lower tier local authorities. Annexure 12.2A shows the recommended allocation of services responsibility to each.

ANNEXURE 12.2A

BROAD ALLOCATION, RECOMMENDED BY GCT REFORM, OF THE SERVICES FUNCTIONS IN
GREATER CAPE TOWN (1205)

	Central government	Provincial government	Metropolitan services authority	Lower tier of local authority	Other bodies (named)
Abattoir : policy, financial responsibility, planning, construction and operation			X		
Fresh produce market : policy, financial responsibility, planning, construction and operation			X	X ¹	
Solid wastes -					
- collection					
-policy and financial responsibility			X		
-planning and operation				X	
- transfer					
-policy, financial responsibility and planning			X		
-construction and operation			X		
- disposal					
-policy, financial responsibility and planning			X		
-construction and operation			X		
- resources recovery					
-policy, planning, construction and operation			X		
- by-laws					
-policy			X		
-operation				X	
Education -					
- formal	X	X			
- informal					
-libraries					
-policy, financial responsibility, planning and control	X ⁴		X		
-operation of central facilities			X		
-operation of branch facilities				X	
-museums, art galleries etc					
-of metro interest			X		
-of local interest				X	
Electricity -					
- generation : policy, financial responsibility, planning, construction and operation			X ²		EX
- reticulation					
-policy, financial responsibility and planning			X		
-construction and operation			X	X ⁵	
Emergency service -					
- ambulance					
-policy, financial responsibility, planning and control			X		
-operation of central facilities			X		
-operation of dispersed teams			X		

ANNEXURE 12.2A (Continued)

	Central government	Provincial government	Metropolitan services authority	Lower tier of local authority	Other bodies (named)
- fire				X	
-policy, financial responsibility, planning and control				X	
-operation of central facilities			X		
-operation of dispersed teams			X		
- civil defence				X	
-policy, financial responsibility, planning and control				X	
-operation of central facilities			X		
-operation of dispersed teams			X		
Health -					
- preventive, promotive and environmental					
-policy, financial responsibility, planning and control		X ⁴		X	
-operation, of different parts			X	X	
- curative	X ⁴ ,				
-policy, financial responsibility, planning and control		X	X		
-operation of part (e.g. regional hospitals and specialist services)		X	X		
-operation of part (e.g. day hospitals)			X		
- consumer protection					
-policy, planning and control			X		
-operation					X
- cemeteries					
-policy, planning, construction and operation			X		
Housing (i.e. public housing) -					
- policy and responsibility (including financial responsibility)		X ⁴		X	
- construction				X	
- physical maintenance, and administration (rent collection, tenant liaison etc.)				X	
Metropolitan development (i.e. strategic planning, especially for economic growth) -					
- physical planning aspects				X	
- employment aspects				X	
Planning, property and related matters -					
- freedom of action within the framework of a coarse-grained metropolitan plan.				X ³	X

ANNEXURE 12.2A (Continued)

	Central government	Provincial government	Metropolitan services authority	Lower tier of local authority	Other bodies (named)
Recreation facilities and civic amenities -					
- of metro interest			X		
-policy, financial responsibility and planning			X		
-construction and operation					
- of local interest					
-policy, financial responsibility and planning	X ⁴			X	
-construction and operation				X	
Roads -					
- primary roads					
-policy, financial responsibility, and planning	X ⁴		X		
-construction and operation			X		
- secondary and tertiary roads					
-policy, financial responsibility, and planning	X ⁴			X	
-construction and operation				X	
Land drainage, sewerage and wastewater treatment -					
- trunks, treatment and waste water reclamation					
-policy, financial responsibility and planning	X ⁴		X		
-construction and operation (where conveyance costs permit)			X		
-construction and operation (where conveyance costs do not permit)				X	
- reticulation					
-policy, financial responsibility and planning	X ⁴		X ³	X	
-construction and operation				X	
- by-laws and effluent monitoring					
-policy			X		
-operation				X	
Transport and traffic -					
- transport : policy, financial responsibility and planning	X ⁴		X		
- public transport operation			X		PX, SX
- traffic control			X		
- major parking					
-policy and planning			X		
-construction and operation				X	
Water -					
- catchment and bulk conveyance to convenient point before treatment works					
-policy, financial responsibility and planning	X		X ²		
-construction and operation	X		X ²		

ANNEXURE 12.2A (Continued)

- treatment and conveyance from convenient point to service reservoirs
 - policy, financial responsibility and planning
 - construction and operation
- reticulation
 - policy, financial responsibility and planning
 - construction and operation

Support service -

- scientific services, mapping, mechanical engineering, computer facilities, central data bank, and other aspects-
 - policy, financial responsibility and planning
 - operation
- councillor services, staff and general office, local authority fixed property, local authority finance-
 - of metro interest
 - policy, financial responsibility and planning
 - operation
 - of local interest
 - policy, financial responsibility and planning
 - operation

	Central government	Provincial government	Metropolitan services authority	Lower tier of local authority	Other bodies (named)
			X		
			X		
X ⁴			X	X ⁵	
			X		
			X		
			X		
				X	
				X	

NOTES:

- i) X indicates allocation of responsibility. (Private enterprise may also be involved, as consultants, contractors, suppliers of material etc, but theirs is seldom the primary responsibility for the service provision.)
- ii) Index to names of "other bodies" -
 - E = Escom
 - P = Private enterprise
 - S = South African Transport Services
- iii) "1" indicates suburban retail markets only.
 "2" indicates in respect of exploitation of unique circumstances at small scale only.
 "3" indicates a review function only.
 "4" indicates a share of financial responsibility in certain circumstances only (sometimes in public housing areas only, as in respect of libraries, recreation facilities and housing).
 "5" indicates local authorities away from the main urban mass only, e.g. Paarl, Stellenbosch and Somerset West.
- iv) Over and above the financial responsibilities indicated above, arrangements will be necessary, according to circumstances, for complementary subsidies and/or transfer payments to be made by various tiers of government to others.

13

CASE STUDY : GREATER CAPE
TOWN : FURTHER STUDIES

University of Cape Town

Chapter objective

The objective of this chapter is to describe the further studies needed in the case study area were the recommendations outlined in Chapter 12 to be carried through to implementation.

The case study investigation in this thesis, being a reporting of the intensive investigation in GCT reform, convincingly states that there should be instituted for GCT, with the minimum of delay, an organisation for metropolitan services provision, with the distribution of responsibilities sketched in Annexure 12.2A.

As Keynote 2 of this thesis observes, it should not be anticipated that a recommendation for change in the organisation for the provision of services in any metropolitan area will be favourably or even tolerantly received by all affected parties.

However, the report GCT reform will have succeeded if it becomes an agent for genuine change along the broad principles of its own recommendations for change. Hence its final test will be: will it generate an atmosphere of reform, and will this atmosphere, as a result of the report, be a properly informed one?

Another study should therefore draw up a strategy for appropriate debate of the recommendations, so that they may be accepted and implemented.

This strategy should include adequate and early consultation with the authorities responsible for the provision of services, and indeed also with representatives of the consumers of those services, on the giving of effect to the recommendations. These parties would be aware of the investigation, because they would have been canvassed as part of the first step of the methodology, but they would probably not be aware, or would only be partly aware, of the findings. It might well be necessary to conduct an extensive campaign to ensure that the debate on the recommendations is sufficiently informed.

Seven additional studies are required in order to clarify aspects of great interest to the implementation of any reform. However it must be pointed out that the above recommendations on services provision are not in any way dependent on the findings of these separate reports. It will be in order if these studies follow, and do not precede or are not concurrent with, the consideration and the acceptance or modification or rejection of the recommendations of GCT reform.

This chapter describes the further studies needed, but does not proceed to making these studies; they stand outside the brief of the thesis. The principal studies are of -

- financial arrangements;
- redelimitation and regrouping of local authorities;
- constitutional and statutory aspects;
- internal organisation of any bodies set up;
- community participation and control;
- strategy for implementation of the proposals; and
- procedures for further review and adaptation.

One study must deal with financial arrangements. It must give attention particularly to -

- the sources of funds to enable the metropolitan tier to perform services presently the responsibility of local authorities, umbrella bodies, the CPA and other authorities in GCT;
- the sources of funds for the local authorities at the lower tier which are likely to be established in poorer areas; and
- an analysis of how the assessment rates basis of each of the existing local authorities is likely to change. (For background see Sections 8.3.2.2 and 8.3.2.3.)

A study should follow, after several years of successful operation of the metropolitan services authority, on a redelimitation of and regrouping of local authorities at the lower tier. This investigation should preferably not take place earlier, i.e. too soon after the establishment of the proposed metropolitan authority. Such an attempt would necessarily be hindered by the lack of evidence as to how the lower tier authorities could best work with the metropolitan tier to their mutual benefit.

The third, fourth and fifth studies are particularly closely interrelated.

A third study needs to cover the organisational structures of the metropolitan services authority and of the lower tier of local authorities. While authorities in the latter tier would presumably carry on very much as before, although abbreviated because of their responsibility for less functions, a comprehensive investigation is

required into the former tier. This proposed study would need to reach conclusions on and to supply a formal organisational chart, descriptions of relationships, descriptions of committees and departments, and ideas of staff sizes and other resources required. GCT reform partly covered this topic in its Chapter 11. (1301)

A fourth study is needed to cover constitutional and statutory aspects in respect of the metropolitan tier of authority. These would include whether there is to be a metropolitan system of government to accompany the change to metropolitan services provision or not. A preliminary idea would be needed of empowering legislative change, if any.

The metropolitan authority could be simply a services authority, with technocrat control, control by nominees of the lower tier authority and maybe provincial or central governments, or other control not directly elected by the citizens, or it could be full-fledged metropolitan government. A final decision on this was, however, outside the scope of GCT reform; it is not an issue on which engineering judgement can be brought to bear. Therefore: "Recommendation 3: That no decision be made now to establish a metropolitan government rather than a services authority; rather that the services authority be established and allowed to operate for a number of years, at which time the position should be reviewed. (Should a thorough investigation then reveal that a switch to metropolitan government is warranted, this switch could be made. Alternatively the decision could be further postponed.)" (1302)

The Industrial Development Corporation (and thus by implication the President's Council), by means of a completely independent thought process, agreed. "The creation of metropolitan authorities or a new tier of government may be considered a too drastic and disruptive step to take. As a compromise and first step, a metropolitan agency, not superior to local authorities, could be contemplated. The fundamental powers mentioned above are, however, essential and can ideally be exercised properly by a true metropolitan authority." (1303)

A fifth study, complementary to the fourth, must investigate community participation in and control of the metropolitan authority. Four questions must be answered by this study -

- what the total number of representatives on the metropolitan council should be;
- how the chairman should be selected and what authority he should be given;
- whether the representatives should be directly elected by the citizens (and if so, on what basis) or if they should be elected from the ranks of the lower tier authority councillors, or by any other means; and
- in what proportions the various existing and proposed local authorities (or constituencies of any other type) should be represented on the metropolitan council.

A sixth study should result in the production of a time and resources programme of the path, from acceptance of the recommendations for organisational change of GCT reform, to full implementation thereof.

As motivated in Section 8.4.3.2, there should be arrangements for future review and adaptation, to changing circumstances, of the new services provision system. A seventh study should investigate guidelines for review and adaptation.

All these studies should carefully observe, and influence if necessary, central government's own proposals for the role and resources of local and metropolitan authorities.

University of Cape Town

I INTRODUCTION

1. Criteria and objectives
2. Local authority services provision forms in metropolitan areas : alternatives
3. Necessity for change, and approaches to change

II SYSTEMS AND METHODOLOGY

4. A deeper investigation of the nature of the efficiency and effectiveness criterion
5. The systems nature of services provision
6. The generalised methodology of investigation

III INVESTIGATION

7. The services investigation : individual services
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IV CASE STUDY

9. Case studies : general remarks
10. Case study : Greater Cape Town investigation
11. Case study : Greater Cape Town : preliminary conclusions : the efficiency and effectiveness criterion only
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V CLOSURE

14. Conclusions and commentary

14

CONCLUSIONS AND COMMENTARY

University of Cape Town

- 14.1 THE OBJECTIVES ACHIEVED
- 14.2 CONTRIBUTION TO KNOWLEDGE
- 14.3 A NECESSARY APPLICATION OF THE METHODOLOGY

University of Cape Town

Chapter objective

The objective of this, the last chapter, is to briefly assess the thesis against its stated objectives. It makes a brief formal statement of the contribution of the thesis to knowledge, and concludes with comment on the applicability of the perception and the methodology.

14.1 THE OBJECTIVES ACHIEVED

It is recalled that the primary objective of this thesis is stated in Section 1.3 as being "to devise a methodology which should be used in the investigation of organisational forms for the provision of local authority services, especially engineering services, in any metropolitan area."

A suitable methodology is devised in the earlier chapters, and is presented in Chapter 6. While it could not be expected to be applicable to all metropolitan areas, it is anticipated that the methodology could be used in virtually any metropolitan area. Chapters 7 and 8 give in-depth description of the methodology, its generalised application, and information sources. Thus the methodology set out in Chapter 6 fulfils the primary objective of the thesis.

There is no reason in theory why the methodology should be invalidated by circumstances where concepts of efficiency and effectiveness, finance and particularly community participation differ from those in which the methodology is derived. (These circumstances are referred to in Section 1.3 above.) Caution must be exercised in the second stage of the methodology, viz in the selection of data, but this caution is of course essential to any application of the methodology.

The other three objectives of the thesis are also met. These relate to -

- establishing operational criteria;
- obtaining a perception of services provision; and
- examining and illustrating the methodology. (Section 1.3.)

The first of these is taken care of in Section 1.2. It is reasonable to claim that the thesis as a whole takes care of the second. The methodology is examined and illustrated, by applying it to a suitable case study area, in Chapters 9 to 13, thus fulfilling the third of these other objectives. That no changes are found necessary is a reflection of the fact that the prototype of the thesis methodology was evolved concomitant with the writing of GCT reform.

Thus all the objectives of the thesis are met.

14.2 CONTRIBUTION TO KNOWLEDGE

It is necessary that a PhD thesis significantly contributes to knowledge in its chosen field. The current thesis does so, in the respects set out below.

Its principal contribution is the devising of the methodology, as fully specified in the primary objective. An example of the circumstances in which this methodology should be put to good use is noted in Section 14.3 below.

Chapters 7 and 8 give an in-depth description of the methodology and its generalised application, and the contribution of the thesis to knowledge is greater thereby.

The "specific operational criteria" quoted in the originally-stated objectives of the thesis (Section 1.3), while not an independent contribution to knowledge, are a vital part of the thesis methodology.

The systems nature of local authority services provision, with its manifold interrelationships and externalities, is highlighted in Chapter 5, and further evidence of this is provided at several subsequent points in the thesis. In the identification of this nature lies a secondary contribution of the thesis.

The case study itself is a substantial contribution to local knowledge of services provision. However the credit for this contribution strictly speaking belongs to the report GCT reform, which was researched and written by the thesis author. GCT reform has also amassed substantial evidence on services provision which would be of great use to any application of the methodology.

Referring back to another objective of the thesis (Section 1.3), a perception of services provision characteristics in metropolitan areas has certainly been obtained. However this thesis cannot claim a significant contribution to knowledge in this respect, as such perceptions have been obtained before, for example by Robson (1972),

Thompson (1968) and others quoted in the thesis. Nevertheless the thesis has established that these perceptions are still valid, and it has indeed added to them, especially in respect of the particular circumstances of GCT.

14.3 A NECESSARY APPLICATION OF THE METHODOLOGY

The methodology should be put to good use in the investigations which the President's Council findings have recommended.

"Recommendation Thirty-one: Investigation re metropolitan government: That a committee of experts in the academic, technical and administrative fields be set up to investigate and advise on the establishment of metropolitan authorities in large urban areas. Provision should be made in the composition of this committee for representation of any area to be investigated as well as for the provincial and central governments." (1401)

The City Engineer commented: "It would be surprising to discover that there is a universal formula for the organisation of services provision which is generally applicable to all or even to several metropolitan areas in South Africa. Major divergences would arise from the differences in services circumstances, particularly as expressed in the existence of and familiarity with inter-authority co-operative agreements, and in natural and historical factors which determine the ease or difficulty with which certain major infrastructural services can be switched to control by a multipurpose metropolitan authority." (1402)

The thesis methodology should be used by any "committee of experts" constituted for the purpose defined above. As observed by the City Engineer, there is no universal organisational form, even within South Africa, and the approach of the methodology would be of the greatest usefulness to the committee. It is necessary, in the national interest, that those responsible for such a committee be appraised of the potential and relevance of the methodology.

In respect of GCT, the City Engineer pointed out that the work of the committee of experts had already been done. "It is my opinion that GCT reform constitutes a thorough and sufficient investigation

of the subject of a metropolitan services authority in the metropolitan area of Greater Cape Town." (1403)

It is recommended therefore that, subject to the approval of the University of Cape Town, copies of this thesis be forwarded to the appropriate quarters, in order that its contribution to knowledge may without delay be put to practical use in South Africa, if not elsewhere as well.

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