CHAPTER 1 INTRODUCTION

1.1 Background

There is increasing interest in the quality of public sector financial reporting. In 1983, the Public Sector Accounting Standards Board (PSASB) was established with the objective of improving the quality of financial reporting in the public sector. One of the important changes in the financial reporting in the public sector was the adoption of accrual basis of accounting. This has been introduced to government departments in New South Wales since 1989 over a five-year period (Scullion, 1989, p.236). Thus, public sector entities are required to report physical assets, including infrastructure, in the financial statements. The controversial issue here is how infrastructure should be reported.

Infrastructure is a significant asset in the public sector since the acquisition and maintenance of it involve a considerable amount of financial resources. According to the Australian Bureau of Statistics (1993, p.51), the gross fixed capital expenditure on transport and communication amounts to $3,741 million for all the state and territory governments in Australia for the year 1992-93. This is the biggest item of the gross fixed capital expenditure by purpose, accounting for about 33 percent of the total gross fixed capital expenditure. The second biggest item is housing and community amenities, including water supply, which amounts to $2,484 million, approximately 22 percent of the total gross fixed capital expenditure. These two items together constitute over 50 percent of the total gross fixed capital expenditure.

Financial reporting of infrastructure is an important aspect of the improvement in effective management of infrastructure. The importance of the financial reporting of infrastructure can be illustrated by Van Daniker and Kwiatkowski (1986, p.3):

> Although accounting and financial reporting do not directly fill any potholes or repair any bridges, they can provide useful information to decision makers that can result in potholes being filled and bridges being repaired.

Concerns over the problem of infrastructure reporting has been addressed by a number of authors in recent years, both in Australia (Carpenter, 1986; Burns, 1987, 1989; Rowles, 1991, 1992, 1993) and overseas (Van Daniker and Kwiatkowski, 1986; Currie, 1987; Marquette, et al, 1988; Attmore, et al, 1989; Jackson, 1989). This shows that financial reporting of infrastructure reporting is receiving increased attention since different ways of measurement and disclosure can affect the relevance of information for decision making. This provides the thrust of this study.

Only recently have reporting requirements which make specific reference to infrastructure been developed. For example, in NSW public sector, the following documents and accounting standard have been issued:

- "Policy Guidelines for Valuation of Physical Non-Current Assets in the NSW Public Sector" (NSW Treasury, 1990) provides guidelines on the disclosure and measurement of infrastructure.

- "Financial Reporting Code Under Accrual Accounting for Inner Budget Sector Entities" (NSW Treasury, 1991) requires recognition of infrastructure which meets the definition and recognition criteria.
- "Guidelines for the Capitalisation of Expenditures in the NSW Public Sector" (NSW Treasury, 1994) provides guidelines on the recognition of infrastructure and the reporting of maintenance expenditure.
- AAS 29 "Financial Reporting by Government Departments" requires the reporting of infrastructure as assets and comments on the measurement basis.

Attention of these reporting requirements is directed to the general recognition and measurement issues on infrastructure, but there is little specification on the types of infrastructure information to be disclosed.

Given that the objective of financial reporting is to provide useful information to external users for decision making, the purpose of this study is to evaluate existing reporting practices of infrastructure by selected public sector entities. This will give some insights into the development of the accounting standards for the public sector and eventually answer the question of how infrastructure assets should be reported.

1.2 Statement of the Problem

The reporting practices of infrastructure in the public sector have been criticized in recent years for not reporting sufficient infrastructure information. Burns (1987, 1989) expressed concerns on the problems of the existing infrastructure and questioned the availability of accounting information to assess the value and the

service standards of infrastructure. There were inadequate management and reporting of infrastructure. Carpenter (1986) commented that infrastructure represented the most significant resource in the public sector which was generally not reported. The author believed that accounting information on the value and utilization of infrastructure could provide important information for decision makers. Rowles (1991,1992,1993) argued that existing diverse reporting practices on infrastructure in the public sector would impair the quality of financial reporting. In addition to information on spending on infrastructure assets, knowledge of the stock of assets and of the consumption of the service potential of infrastructure assets were required for economic decision making.

In the light of the significance of infrastructure and the criticisms on the insufficiency of information on infrastructure for decision making, it is a real concern that actions should be taken to enhance the quality of reporting of infrastructure. This gives an impetus for this study to investigate the existing reporting practices on infrastructure by the public sector entities.

Given that the objective of general purpose financial reporting is to provide useful information to users for decision making, this study evaluates the existing reporting practices of infrastructure assets by the public sector entities in relation to the disclosure of infrastructure information which is considered useful to meet users' information needs. This will (1) provide empirical evidence on the existing debate and (2) provide insights useful to the standard setting bodies regarding the reporting requirements on infrastructure assets. The existing conceptual framework is a useful

frame of reference to evaluate the problem. The study is based on the conceptual framework of general purpose financial reporting and related literature.

1.3 The Objectives

The objective of this research is to evaluate the existing disclosure practices of infrastructure by the public sector entities. Specifically, the study examines the annual reports of the public sector entities in New South Wales so as to determine:

(1) whether the public sector entities disclose information on infrastructure which is considered useful to meet users' information needs;

(2) whether the level of disclosure of infrastructure relates to the interests of particular group of users.

1.4 Justification for the Study

A major concern of public sector financial reporting is to provide useful information to users for decision making. Following the proposal to introduce accrual basis of accounting, a controversial issue is the financial reporting of the public sector assets. Infrastructure is a significant public sector asset. Different views and different reporting practices for infrastructure would impair the quality and usefulness of the public sector financial reports. Thus, research on the financial reporting of infrastructure will be necessary.

There is currently limited empirical research on the financial reporting of infrastructure. This study contributes by providing empirical evidence in this area and providing the accounting standard setting bodies and other regulatory bodies with evidence on the existing infrastructure reporting by public sector entities which would assist the evaluation and development of reporting requirements for infrastructure.

The conceptual framework of general purpose financial reporting provides a basis for the development of accounting standards. Thus, it is considered appropriate to evaluate the existing financial reporting of infrastructure assets by reference to the conceptual framework, using the objective of the general purpose financial reporting stated in the Statements of Accounting Concepts as the evaluation criterion, that is, to provide useful information to users for decision making. The results of this study provide evidence to assess whether this objective suggested by the conceptual framework project is consistently applied by the public sector entities.

1.5 Research Approach

The research methods employed to achieve the objectives and to test the hypotheses developed in Chapter 3 includes the processes of both deduction and induction. This study consists of two parts.

In the first part, the conceptual framework project and the relevant Statements of Accounting Concepts are discussed. This provides a framework for this study. Then, "Public sector entities" are defined by reference to the conceptual framework, relevant

literature and government publications. This provides the scope for the study to identify the public sector entities to be examined in this study. Further, the definition and nature of "general government entities" and "government business entities" are explained.

Next, "Infrastructure" is defined operationally. The definition adopted sets the scope of this study and provides a criterion for identifying the relevant public sector entities to be examined. The issues on the characteristics and recognition of infrastructure are analyzed. This provides a key foundation for this study.

Finally, the groups of users of the public sector annual reports and their information needs on infrastructure are discussed by reference to the conceptual framework and the literature. A list of the information on infrastructure which is considered useful to meet users' information needs is identified.

These procedures form the framework of this study which provides a basis for the development of hypotheses.

The second part of this study employs the process of induction. This involves the gathering of evidence to support or reject the hypotheses as developed. This consists of several procedures. Firstly, a list of public sector entities to be examined is identified. This is based on the definition of public sector entities and infrastructure adopted in this study

Secondly, a list of items on infrastructure to be reported is identified from the literature. This is linked to the discussion on users' information needs on infrastructure in the first part. The scoring system on the items of disclosure is then designed based on previous literature and relevant documents. A pilot test on the annual reports was carried out to assess the feasibility of the scoring system.

Thirdly, data are gathered from the selected public sector entities' annual reports in a systematic and structured way. A data collection form is designed for this purpose. The data is then scored by the predetermined scoring system.

After that, the stated hypotheses are tested statistically. Statistical tests employed are based on the type of measurement scales and whether the assumptions of particular tests are met. Finally, the results are analyzed and discussed. Implications from the results are drawn.

1.6 Organization of the Study

The rest of the chapters are organized as follow:

In Chapter 2, the conceptual framework project which is relevant to this study will be discussed. The terms "public sector entities", "general government entities" and "government business entities" will be defined. "Infrastructure" will be defined and its characteristics and recognition issues will be discussed. User groups of the public

sector financial reports will be identified. Users' information needs on infrastructure, both financial and non-financial information, will be analyzed.

In Chapter 3, the hypotheses to be tested will be developed. The testing of the hypotheses will achieve the objectives of the study. They will be developed by reference to the conceptual framework and relevant literature, and will be based on the framework outlined in Chapter 2.

In Chapter 4, the population to be studied and the public sector entities to be examined will be stated. Research sample and data collection procedures will be described. The variables for hypotheses testing, including the measure of the level of disclosure and the scoring system, the classification of the types of entities and types of infrastructure, and the measure for user groups' interests will be explained. Finally, the statistical tests employed will be described.

The analysis of the statistical testing of the hypotheses will be included in Chapter 5. Results will be presented and discussed. The significance of the results to the hypotheses and the objectives of the study will be highlighted.

In Chapter 6, the research study will be summarized. Major findings will be reviewed. The limitations of the study will be pointed out. The implications of the research and the recommendation for future research will also be discussed.

CHAPTER 2 INFRASTRUCTURE AND INFORMATION NEEDS

2.1 Introduction

In this chapter, the framework of the study is provided. This is built on the conceptual framework of general purpose financial reporting. The relevant building blocks of the conceptual framework will be discussed. The meaning of the "public sector entities" and "infrastructure" will be defined. Issues on infrastructure and information needs on infrastructure which are linked to hypotheses developed in Chapter 3 will be discussed.

2.2 Conceptual Framework Project

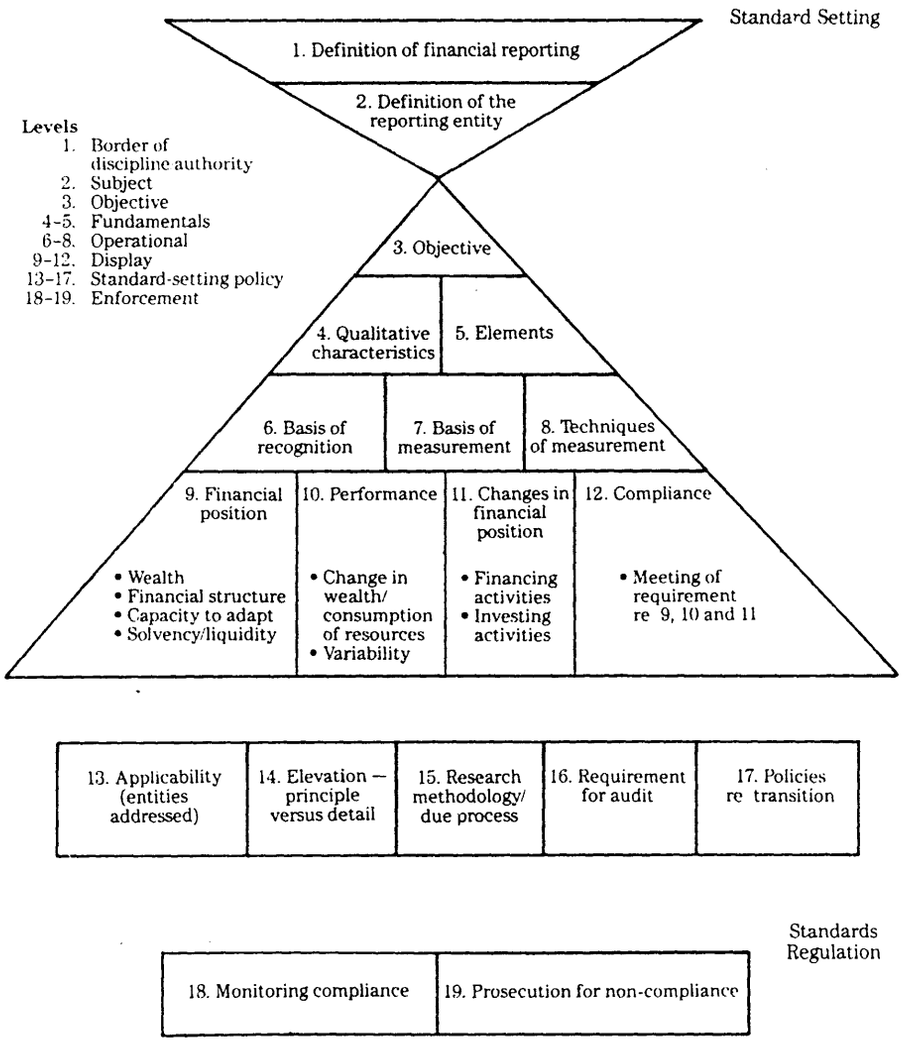
The conceptual framework project provides a basis for the development of accounting standards and assists the preparation of the general purpose financial reports (ASRB Release 100, para. 8). Thus it provides a means to evaluate the existing financial reporting practices on infrastructure assets by the public sector entities. This is the foundation for this study.

Figure 2.1 is the diagrammatic representation of the tentative building blocks of the conceptual framework project developed by the Australian Accounting Research Foundation. The conceptual framework comprises of two parts, standard setting and standards regulation. The levels of the building blocks includes border of

discipline/authority, subject, objective, fundamentals, operational, display, standard-setting policy and enforcement.

Figure 2.1

Tentative Building Blocks of a Conceptual Framework for General Purpose Financial Reporting[1]



Source: ASRB Release 100 "Nature of Approved Accounting Standards and Statements of Accounting Concepts and Criteria for the Evaluation of Proposed Approved Accounting Standards", p.9.

[1]The conceptual framework consists of a series of Statements of Accounting Concepts. Levels 2, 3 and 4 are addressed by the Statement of Accounting Concepts SAC 1, SAC 2 and SAC 3 respectively. Levels 5 and 6 are addressed by SAC 4. Levels 7 and 8 will be addressed by the proposed SAC 5. The Statements of Accounting Concepts are discussed in section 2.2.1 later.

The first level delineates the boundaries of financial reporting and the scope of the Statements of Accounting Concepts and Accounting Standards. It also involves consideration of the types of information which should be included in general purpose financial reports. The second level deals with the definition of the reporting entity. It establishes the criterion to determine which entities are reporting entities and are therefore required to prepare general purpose financial reports.

The objective level specifies the objective of general purpose financial reporting and identifies the users of general purpose financial reporting. The fundamentals level deals with two aspects. It identifies the qualitative characteristics of financial information so as to achieve the objective of general purpose financial reporting, and defines the elements of financial statements which include assets, liabilities, equity, revenues and expenses. The operational level deals with three aspects. Firstly, it deals with the basis of recognition of elements. Criteria for recognition are established in order to satisfy the objective of general purpose financial reporting and qualitative characteristics of financial information. The second and third aspects are concerned with the basis of measurement and the techniques of measurement of the elements of financial statements given the objective of general purpose financial reporting and the qualitative characteristics of financial information.

The display level deals with the disclosure of financial information in general purpose financial reports. It involves four aspects: financial position, performance, changes in financial position and compliance. These correspond to the balance sheet, the

operating statement and the cash flow statement. Information relating to compliance may also be required by users.

The last two levels are concerned with standards regulation. They are concerned with standard setting policies and procedures on compliance with Statements of Accounting Concepts and Accounting Standards. They are of no direct concern to this study.

These levels are related to one another. Henderson and Peirson (1989, p.6) stated that:

> In general terms, the border of the discipline, the subject and the objective levels are the foundations of the structure. Each succeeding level depends upon its predecessors. For example, fundamentals cannot be specified without an objective and display cannot be determined without a knowledge of the operational aspects of the framework.

This study examines the disclosure of infrastructure information by the public sector entities. Disclosure is at the display level. The evaluation of this level is based on the preceding levels, the subject, objective, fundamentals and operational levels. Specifically, the objective level is used as the evaluation criterion.

The conceptual framework consists of a series of Statements of Accounting Concepts which are produced within the building blocks of the framework. These Statements of Accounting Concepts set out the general concepts which should be followed in the

preparation and presentation of general purpose financial reports. (ASRB Release 100, para. 9) The Statements of Accounting Concepts which are relevant to this study are outlined in the following sections and the framework for this study is discussed.

2.2.1 Statements of Accounting Concepts

Statement of Accounting Concepts SAC 1 "Definition of the Reporting Entity" defines and explains the concept of a reporting entities. This Statement addresses level 2 of the conceptual framework in Figure 2.1. This Statement relates to users' information needs so as to satisfy the objective of general purpose financial reporting (para. 11). The concept of reporting entities is defined in this Statement as:

> "all entities in respect of which it is reasonable to expect the existence of users dependent on general purpose financial reports for information which will be useful to them for making and evaluating decisions about the allocation of scarce resources" (para. 40)

The concept of the reporting entity is applied to entities in both private and public sector, irrespective of whether the entity is business or non-business/profit or not-for-profit (para. 13). Applying the concept to the public sector, then most government departments and statutory authorities will be reporting entities (para. 24). Since the concept of reporting entity is linked to users' information needs, SAC 1 (paras. 20-22) identifies three factors which indicate whether dependent users exist. These are (1) separation of management from economic interest, (2) economic or political

importance/influence, (3) financial characteristics including the size or indebtedness of an entity. Groups of users and their information needs are further discussed in SAC 2 and section 2.5 of this chapter.

Statement of Accounting Concepts SAC 2 "Objective of General Purpose Financial Reporting", which addresses level 3 of the conceptual framework in Figure 2.1, states that general purpose financial reporting is a means of communicating relevant information to users. Thus the objective of the general purpose financial reporting is to:

> "...provide information useful to users for making and evaluating decisions about the allocation of scarce resources." (para. 43)

SAC 2 identifies three groups of users: resource providers, recipients of goods and services, and parties performing review or oversight function[2]. These users rely on the general purpose financial reports for information for decision making.

The conceptual framework applies to entities in both private and public sector. In that infrastructure may be a significant asset, it can be expected that there are users interested in the financial information on infrastructure for making decision about resources allocation. Rowles (1992, p.10) made the following comments on this point:

[2]Thereafter the term "parties performing an oversight function" will be used in this study.

> Infrastructure assets ..... involve large commitments of scarce community resources. The way in which resources are employed and managed can be expected to influence such matters as taxes, rates, utility tariffs, levels of community indebtedness and levels of service. Accordingly, citizens generally can be anticipated to have a particular interest in being informed about the financial affairs of public sector entities controlling such assets.

For the public sector, both financial and non-financial information may be useful to users. For example, SAC 2 states that "aspects of the performance of a reporting entity can be measured in financial and non-financial terms" (para. 29). In particular, SAC 2 addresses that in the public sector, information about government policies that affect a reporting entity's operations is useful to assess the performance of the entity and the ability of an entity to continue to provide goods and services in the future (paras. 31, 37). Infrastructure information, in terms of both financial and non-financial types of information, which is considered useful to users is discussed in detail in section 2.5.2 of this chapter.

Statement of Accounting Concepts SAC 3 "Qualitative Characteristics of Financial Information" addresses level 4 of the conceptual framework in Figure 2.1. Information which is useful to users should possess the qualitative characteristics as outlined in SAC 3. These includes relevance, reliability, comparability and understandability. Information on infrastructure, if it is to be useful to users, should also possess these qualitative characteristics.

The qualitative characteristic of "relevance" is of particular interest to this study. SAC 3 (para. 8) interprets "relevance" thus:

> For financial information to be relevant it must have value in terms of assisting users in making and evaluating decisions about the allocation of scarce resources.....
>
> If information is to assist users in making decisions about the allocation of scarce resources, it must assist them in making predictions about future situations and in forming expectations, and/or it must play a confirmatory role in respect of their past evaluations.

Thus, the qualitative characteristic of "relevance" is linked to the objective of general purpose financial reporting. For information to be useful to users for making decisions about the allocation of scarce resources, it should be able to assist users in making predictions and confirming past evaluations. Infrastructure information, including financial and non-financial information, is considered useful to users in the sense that they help users to assess the current standard and quality of the infrastructure provided, and to make prediction and expectation about the standard and quality of future infrastructure provision. Thus, if the public sector entities disclose such infrastructure information, it would be relevant to users.

Statement of Accounting Concepts SAC 4 "Definition and Recognition of the Elements of Financial Statements" addresses levels 5 and 6 of the conceptual framework in Figure 2.1. This Statement outlines the definitions and recognition

criteria for assets and liabilities. In respect of infrastructure, there are different arguments (Mautz, 1981, 1988; Pallot, 1987, 1990; Strelioff, 1987; Rowles, 1992; Neilson, 1993) on whether infrastructure should be classified as an asset and recognized in the financial reports due to its particular nature, for example, having no market value, not being readily saleable, having indefinite useful life. If SAC 4 provides definition and recognition criteria for assets which are consistent with the objective of the general purpose financial reporting (para. 6), then it would provide a systematic basis to test whether infrastructure is classified as an asset to be recognized in the financial report. While SAC 4 is not operative until 30 June 1995, the contents form part of the framework of this study. It is presently being reviewed by the Australian Accounting Research Foundation to ensure consistency with SAC 5[3]. The characteristics and recognition of infrastructure are discussed in detail in sections 2.4.2 and 2.4.3 of this chapter.

Based on these Statements of Accounting Concepts, the framework for this study is outlined in the next section.

2.2.2 A Framework for the Study

The conceptual framework project provides a foundation for this study to evaluate the disclosure of infrastructure information by the public sector entities. The above

[3] SAC 5 is the proposed Statement of Accounting Concepts dealing with levels 7 and 8 of the conceptual framework project. Being at the proposal stage, it is not explicitly included in the framework of this study.

discussion on the Statements of Accounting Concepts leads to the following premises on which this study is based:

1. SAC 1 defines the concept of reporting entity which is linked to users' information needs. SAC 2 states the objective of general purpose financial reporting is to provide useful information to users for decision making. In addition, SAC 3 identifies the qualitative characteristics which are consistent with the objectives of general purpose financial reporting as stated in SAC 2. Given that a users' needs approach in preparing financial reports is suggested by the Statements of Accounting Concepts, the position of this study is that public sector entities should disclose information on infrastructure in a way that is useful to users.
2. Based on the definition and recognition criteria for assets as stated in SAC 4, infrastructure should be recognized as an asset in the financial statements. This is discussed in detail in section 2.4.3 of this chapter.

The evaluation of the disclosure of infrastructure information by public sector entities for this study is based on these two premises.

This study is mainly based on SAC 2 to which the objectives of this study is linked. The objectives of this study focus on two aspects provided in SAC 2, that is (1) the objective of general purpose financial reporting to provide useful information to users, and (2) the information needs of the three groups of users. Table 2.1 shows how the objectives of this study is linked to these two aspects of SAC 2.

Given that the objective of general purpose financial reporting is to provide useful information to users for decision making, objective (1) of this study is to determine whether the public sector entities disclose information on infrastructure which is considered useful to meet users' information needs. With a users' needs approach, SAC 2 identifies three groups of users who are interested in the general purpose financial reports. Thus objective (2) of this study is to determine whether the level of disclosure on infrastructure relates to the interests of particular group of users.

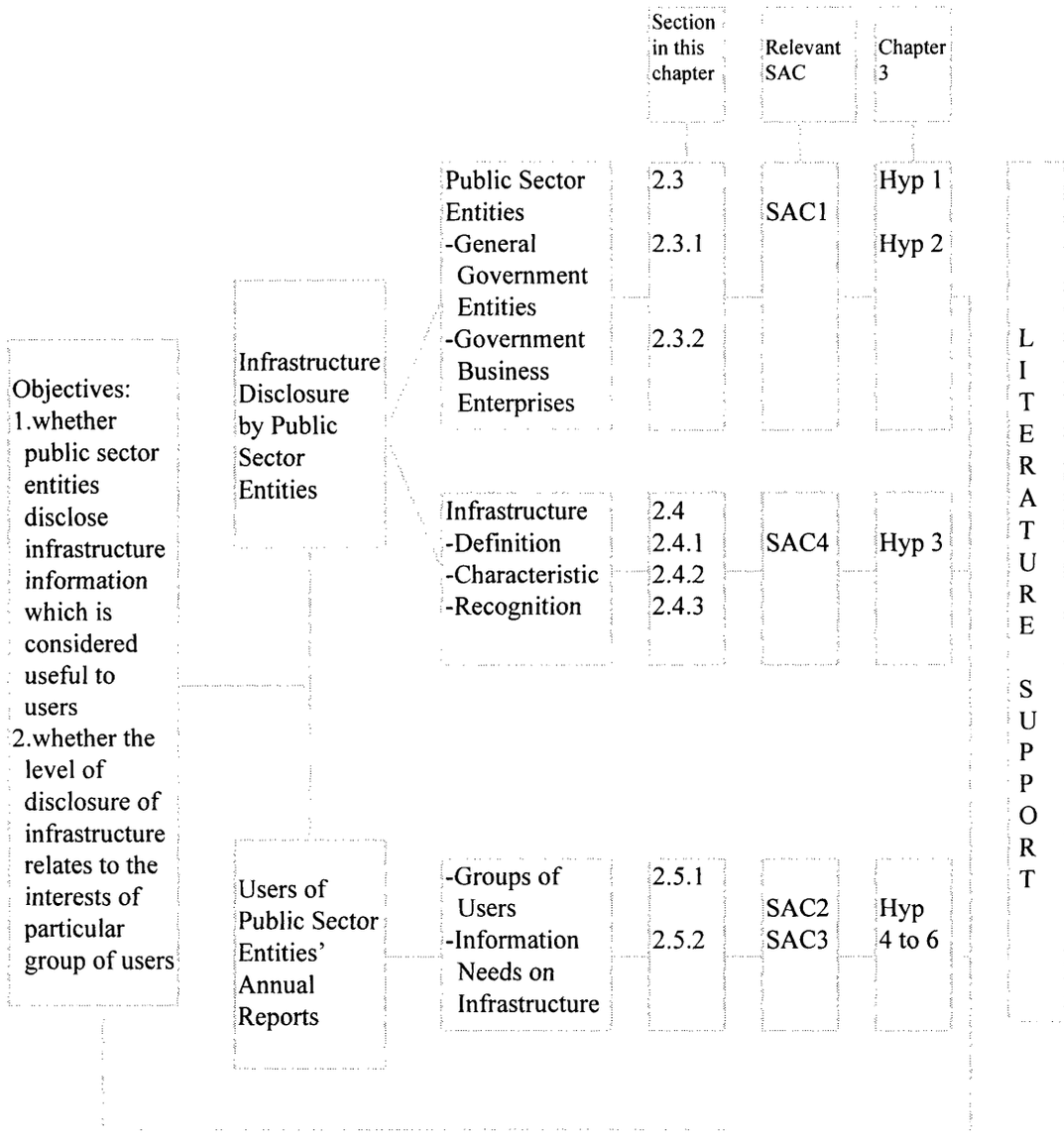
Table 2.1 Objectives of the Study

	SAC 2	**Objectives of this Study**
Objective of general purpose financial reporting	To provide information useful to users for decision making	Whether public sector entities disclose information on infrastructure which is considered useful to meet users' information needs
Groups of users	-Resource providers -Recipients of goods and services -Parties performing an oversight function	Whether the level of disclosure on infrastructure relates to the interests of particular group of users

This study evaluates the disclosure of infrastructure information by public sector entities by testing the infrastructure disclosure against users' information needs on infrastructure. Figure 2.2 shows the structure of this chapter which forms the framework for this study and also a basis to develop the hypotheses in chapter 3.

Figure 2.2

A Framework for the Study



In Figure 2.2, the objectives of the study are stated in the first column. In the second column, infrastructure disclosure by public sector entities is evaluated against users' information needs on infrastructure according to the objectives of the study. In this case, "public sector entities" and "infrastructure" have to be defined. On the other hand, groups of users and their information needs on infrastructure also have to be identified. These aspects are shown in the third column. The fourth column shows the structure of the remainder of this chapter. There, the aspects in the third column are further discussed.

Infrastructure disclosure may be different among different types of public sector entities. In particular, general government entities and government business enterprises are discussed in section 2.3. A definition of infrastructure in section 2.4 will provide scope for selecting public sector entities to be examined. Different views on the characteristics and recognition of infrastructure may affect the disclosure of infrastructure information. These views addressed mainly the issue of whether infrastructure, with its particular nature such as having no market value, not being readily saleable and having indefinite useful life, should be recognized as assets in the financial reports. The characteristics and recognition issues are discussed in order to clarify the position of this study. This study adopts a users' needs approach as suggested by the conceptual framework project. Groups of users of the general purpose financial reports of public sector entities are identified in section 2.5.1. Users' information needs on infrastructure are developed in section 2.5.2 by reference to the literature in order to provide a basis to evaluate the infrastructure disclosure practices by public sector entities.

The various aspects of the study as shown in the third column are discussed in the context of the conceptual framework (column five) and the literature (column seven). Of course, the hypotheses developed in Chapter 3 (column six) are an integral part of that framework.

2.3 Public Sector Entities

Not many authors in the area of public sector accounting attempt to define "public sector". The concept of "public sector" is well explained by the Australian Bureau of Statistics (1987, p.15):

> Conceptually the public sector in Australia is that part of the economy which consists of all resident enterprises through which the Commonwealth, State and local governments, separately or jointly, implement their economic, social and other policies by their ability to control what activities the enterprises undertake and/or how they are undertaken.

From this definition, it can be said that the characteristic of the public sector is government control. The public sector will include departments of state, local government council and statutory authorities. (Australian Bureau of Statistics, 1987, pp.15-16)

Under SAC 1, in order to meet the information needs of users, public sector entities are identified as reporting entities. These include, by definition, government

departments and statutory authorities at all levels (SAC 1, para 25). However, public sector entities can also be classified by the differences in organizational and functional arrangement (Likierman, 1989, p.7). In this study, the following types of public sector entities are discussed:

- general government entities, and
- government business enterprises.

2.3.1 General Government Entities

There is no precise definition of general government entities. The Australian Bureau of Statistics uses the term "general government enterprise" (1987, p.30) and "general government sector" (1990, p.16) which have similar meanings. This is defined as:

> The general government sector consists of all departments, offices and other bodies mainly engaged in the production of goods and services outside the normal market mechanism for consumption by governments and the general public, whose costs of production are mainly financed from public revenues and which provide goods and services to the general public, or sections of the general public, free of charge or at nominal charges well below costs of production. (Australian Bureau of Statistics, 1990, p.16)

Audit Act 1901, Section 2 defines "department" as:

(a) a Department of State; or

(b) a Department of the Parliament;

and includes a prescribed authority.

The Public Finance and Audit Act 1983 also provides a list of departments in Schedule 2 and a list of statutory bodies in Schedule 3. These suggest that the general government entities consists of departments and statutory bodies.

From these definition, the characteristics of general government entities can be summarized as:

1. Scope : include all departments and statutory bodies
2. Operation : outside normal market mechanism
3. Consumers : governments and general public
4. Source of finance : public revenues
5. Objective : Non-profit making

2.3.2 Government Business Enterprises

The differences between general government entities and government business enterprises are again not precisely defined. The Australian Bureau of Statistics uses the term "public trading enterprise" (1987, p.27; 1990, p.15). Others use the term "government enterprise" (Roy, 1988, p.47) or "state owned enterprise" (Morris, 1993, p.20).

Australian Bureau of Statistics (1987, p.27) defined public trading enterprises as:

> This subsector consists of all those resident public enterprises which are mainly engaged in the production of goods and services for sale in the market with the intention of maximizing profits and financial returns to their owners or, at least, of recovering all or a significant proportion of their operating costs from gross trading receipts.

Others (Roy, 1988; Morris, 1993) suggested that these enterprises are owned by government, but they are delegated the authority to carry on a business and given the autonomy to make their own decision. The greatest part of their revenue is generated by sales of goods and services to nongovernment organizations and individuals. They are expected to operate as profitably and efficiently as private sector business.

Thus, the characteristics of government business enterprise can be summarized as:

1. Scope : government owned or controlled enterprise, but has autonomy to make decisions
2. Operation : goods and services sold in the market
3. Consumers : non-government organizations and individuals
4. Source of finance : mostly from sales of goods and services
5. Objective : maximizing returns

These enterprises prepare their financial statements in accordance with the commercial principles generally accepted for business enterprises. But the extent to which they follow private sector practice will depend on the degree of trading involved. (Roy, 1988, pp.47-48; Likierman, 1989, p.7; Miah, 1990, p.60; Fellow and Kelaher, 1991, p.20)

Table 2.2 provides a summary of the differences between general government entities and government business enterprises. In view of these differences, the argument is whether there should be consistent accounting practices among government entities (Macmillan, 1982, pp.6-11; Burns, 1993, p.89). However, given that the objective of general purpose financial reporting is to provide useful information to users for decision making, any reporting requirements developed for both types of government entities should be consistent with this objective, based on users' needs.

Table 2.2

Differences between General Government Entities and Government Business Enterprises

	General Government Entities	**Government Business Enterprises**
Scope	All departments and statutory bodies	Government owned or controlled, but has autonomy to make decisions
Operation	Outside normal market mechanism	Goods and services sold in the market
Consumers	Governments and general public	Non-government organizations and individuals
Source of Finance	public revenues	Mostly from sales of goods and services
Objective	Non-profit making	Maximizing returns to cover costs

2.4 Infrastructure

In this section, infrastructure is defined for the purpose of this study. Issues on the characteristics and recognition of infrastructure are also discussed in order to provide a support to the position of this study that infrastructure should be recognized as an asset in the financial reports.

2.4.1 Definition of Infrastructure

The discussion on "infrastructure" by various authors (Strelioff, 1987; Rowles, 1992; Jackson, 1989; Currie, 1987; Fountain, 1987; NSW Treasury, 1990; Public Accounts Committee, 1993) in recent years has come up to a number of definitions for infrastructure. It is defined in both a broad sense and a specific sense. The idea of what infrastructure is by individual author is outlined in Table 2.3.

In the broad sense, the definitions of infrastructure refers to those resources which:

1. are made available to the public;
2. help to increase the productive capacity of the economy;
3. assist the public to access to economic and social facilities and services.

These are based on the general function of infrastructure. For financial reporting purposes, infrastructure can be defined in a more specific and workable sense based on the types of infrastructure. Summarizing various authors' ideas, infrastructure refers to:

Table 2.3

Definition of Infrastructure

Currie, 1987, p.8	Major civil engineering works, such as dams, reservoirs, highways, railway tunnels and embankments. Network assets which are constructed in blocks or as systems within which it is difficult to define boundaries of costs which are going to be useful in accounting for discrete assets, examples are railway track, roads, power lines, signalling networks, distribution pipelines, etc.
Fountain, fall 1987, p.56	Infrastructure includes community or public domain assets such as roads, bridges, curbs and gutters, streets and sidewalks, drainage systems, mass transit railbeds, water and sewer systems, and monuments.
Strelioff, 1987, p.48	Two types of government's acquired physical assets - those available for use by government, such as inventories, equipment and buildings, and those made available to the public, such as infrastructure roads, bridges and seaways.
Jackson, 1989, p.30	Infrastructure can be defined as fixed assets such as roads, bridges, curbs and gutters, streets and sidewalks, drainage systems, lighting systems and similar assets.
NSW Treasury, 1990, p.4	The term "infrastructure" includes all non-current assets comprising the public facilities that provide essential services and enhance the productive capacity of the economy. It includes such public sector assets as roads, bridges, railroads, sewerage systems, water supply systems and reservoirs, power generation plants and transmission lines, police stations, courthouses, schools, hospitals and other government buildings.
Rowles, 1992, p.33	The term "infrastructure" is usually used to refer to resources such as roads; bridges; government buildings; railways; water, sewerage, gas, telephone and electricity reticulation systems; dams; docks and airports. "Infrastructure" can also include assets which establish basic services for military activities ....includes military bases, depots, ranges, airfields, and harbours. Public infrastructures have been described as complementary to private capital in the economic process, making it more productive.
Public Accounts Committee, 1993, p.4	Infrastructure comprises the physical assets required to satisfy the public's need for access to major economic and social facilities and services. It may be divided into two broad types: economic infrastructure, comprising road, railways, ports, airports, dams and reservoirs, water headworks, water treatment and reticulation facilities, telecommunication and post facilities, power generation facilities; social infrastructure, comprising schools and other education facilities, hospitals, clinics and other health facilities, housing, recreational facilities, law and order facilities.

1. Transport and communication facilities

   Road, bridges, highway, tunnels, railway, curbs and gutters, streets and sidewalks, lighting system, signalling network, airport, aviation facilities and sea transport facilities, telephone system and telecommunication

2. Water work systems

   Water and sewerage system, dams, reservoirs, drainage system

3. Electricity and gas systems

   Electricity and gas generation, transmission and distribution facilities such as electricity reticulation system, power stations, power lines, pipelines

4. Government buildings and other public facilities

   Hospitals, school buildings, prison, recreational facilities, etc.

5. Services for military activities

   Military bases, depots, ranges, airfields and harbours

For the purpose of this study, this specific definition based on types of infrastructure will be adopted. Since this study is at the State level, only the first four types of infrastructure will be used. The last type is irrelevant to this study. This definition will serve as the scope of this study.

These four types of infrastructure can be further classified into two broad types as suggested by the Public Accounts Committee (1993, p.4), that is, **economic** infrastructure and **social** infrastructure. This can be related to the definitions in Table 2.3 and the four types. Economic infrastructure comprises the first three types of infrastructure, that is, transport and communication facilities, water work systems, electricity and gas systems. The fourth type of infrastructure, that is, government buildings and other public facilities, belongs to social infrastructure.

Infrastructure can be controlled by the public sector or private sector, especially with the recent trend of privatization of public resources (Rowles, 1992, p.33). This study only focus on infrastructure provided by entities in the public sector.

In order to study the financial reporting on infrastructure, it is necessary to have a brief understanding on the characteristics and recognition of infrastructure. These are discussed in the following sections.

2.4.2 Characteristics of Infrastructure

There are different views on the characteristics of infrastructure (Mautz, 1981, 1988; Pallot, 1987,1990; Strelioff, 1987; Rowles, 1992; Neilson, 1993). These views were directed to the issue of whether infrastructure possesses particular characteristics that enable it to be classified as an asset and recognized in the financial reports.

Mautz (1981, pp.53-54; 1988, p.125) argued that government properties such as a memorial or city park, which were considered by citizens as assets, would not meet the concept of an asset as used in business. These properties involved maintenance and operation costs which were more than the receipts from the properties. They produce a negative cash flow. Thus, they are in fact properly regarded as liabilities rather than assets. Neilson (1993, p.54) shared the same idea that governments engaged in non-profit-generating activities. They held assets which did not generate financial profits and had no commercial value. He questioned the suitability of accrual accounting for government entities and hence the recognition of government assets.

Pallot (1987, p.44) carried out a survey on the concept of "community assets", and concluded that there were certain characteristics that distinguished "community assets" from other assets. Pallot adopted a broader view that not only included such aspects as net negative cash flow, not readily saleable, and indefinite useful life, but also adopted the public good concept that for community assets, it was difficult to exclude non-payers from the benefit of the assets. In his later article (1990, p.83), he further extended the characteristics of community assets to the aspect that they served a social, rather than commercial, purpose, and were available for direct use of the community. Strelioff (1987, p.48) also agreed that infrastructure were those assets that were made available to the public. Despite these particular characteristics, Pallot suggested that they should be recognized as assets separately, and possibly used the term "infrastructure assets" (1987, p.45).

From the above discussion, it can be seen that the characteristics of infrastructure argued by various authors are related to three levels: financial, economic and social. At financial level, infrastructure do not generally generate net positive cash flow, have no market value, not readily saleable and have an indefinite useful life (Mautz, 1981, 1988; Pallot, 1987, 1990; Neilson, 1993). At economic level, they are a public good in nature and it is difficult to exclude non-payers (Pallot, 1987). At social level, they serve a social, rather than commercial, purpose and are available for use by the public (Strelioff, 1987; Pallot, 1990). The different opinions on the characteristics of infrastructure are summarized in Table 2.4.

Table 2.4

Characteristics of Infrastructure

Mautz, 1981	produce negative cash flow not an asset, should be viewed as liability
Pallot, 1987	not intended that the asset generates net positive cash flows reporting organization has no complete autonomy to acquire or dispose of the asset not readily saleable has indefinite useful life difficult to exclude non-payer
Strelioff, 1987	used primarily by the public
Mautz, 1988	monuments are liabilities, commitments
Pallot, 1990	community assets have a social rather than commercial purpose available for direct use of the community at large not saleable
Rowles, 1992	infrastructures are not different from other assets apply SAC 4 definition of assets
Neilson, 1993	do not generate profits not normally negotiable lack commercial and economic value

However, these diverse opinions do not resolve the issue of whether infrastructure should be recognized in the financial reports. Rowles (1992) concluded that these characteristics are not confined to infrastructure and therefore unhelpful to distinguish infrastructure from other assets for reporting purposes. Whether to recognize infrastructure as assets in the financial reports can be tested against the criteria set out in SAC 4.

2.4.3 Recognition of Infrastructure Assets

The characteristics of infrastructure discussed above do not provide a strong base for settling the recognition problem of infrastructure. SAC 4 outlines the definition and recognition criteria for assets which provides a more systematic and consistent base for analysis. Items which meet these definition and recognition tests should be recognized as assets in the financial reports. A brief outline of the recognition issue on infrastructure will help clarify the position for this study.

SAC 4 (para. 12) states that:

> "Assets" are service potential or future economic benefits controlled by the entity as a result of past transactions or other past events.

Thus, there are three essential characteristics of assets:

- service potential or future economic benefits,

- control by a particular entity, and
- occurrence of past transactions or past events.

If infrastructure possesses these three characteristics, it should be recognized as an asset.

Service Potential

"Service potential" or "future economic benefits" is the scarce capacity of the assets to provide services or benefits to the entities that use them. It is argued that both profit seeking and not-for-profit entities, in the private or public sector, use assets to provide goods and services that their customers need. Thus, assets provide a means for entities to achieve their objectives (SAC 4, para. 16). Hence, this characteristic is common to all assets, no matter whether they are used by the private or public sector entities. Infrastructure facilities are provided by entities to satisfy customers' need. They provide a means for entities to achieve their economic and social objectives. Thus, infrastructure possesses the characteristic of "service potential" or "future economic benefit".

Rowles (1992, p.46) applied the SAC 4 definition of assets and concluded that infrastructure possesses this essential characteristic:

> In the case of a not-for-profit entity, in either the public or the private sectors, the objective of the entity is the provision of goods and services to a community, for example, services from roads, libraries, galleries, museums

etc. Assets of these entities contribute to the achievement of entity objectives by providing road services, library services and cultural services etc.

Control

The second characteristic is "control" by a particular entity. That is the capacity of the entity to benefit from the asset and to deny or to regulate the access of others to that benefit (SAC 4, para. 22). SAC 4 (para. 25) notes that infrastructure such as public highways or general access to air or water can only be qualified as assets of those entities who operate them, rather than those entities who use them since entities who use the highways are unable to control access to them by other entities.

Rowles (1992, p.47) argued that ownership of infrastructure would ultimately be with the government or the crown, but control might also lie with an agency of the government. Thus, infrastructure assets were no different from other assets.

Besides, SAC 4 regards public highways as assets of those entities responsible for their operation. In this sense, infrastructure possesses this essential characteristic and can be qualified as an asset. Miller and Islam (1988, p.111) also suggested that public sector entities may have restricted options regarding the retention and utilisation of infrastructure facilities. But they should not be disqualified from assets status on the basis of restricted control.

Occurrence of Past Transactions

The third essential characteristic of an asset is that transactions giving rise to control over service potential or future economic benefits should have occurred. This includes non-reciprocal transfers, such as donations, grants, appropriations or contributions by owners or members (SAC 4, para. 27).

Infrastructure projects may be publicly-funded or privately-funded which are later transferred to the government for no payment (Public Accounts Committee, 1993, p.xi).[4] These arrangements represent past transactions and thus infrastructure possesses this essential characteristic.

Recognition Criteria

From the above analysis, infrastructure qualifies as an asset under the definition of SAC 4. It should be recognized in the financial reports if it also satisfies the recognition criteria. This requires that it is probable that the service potential or future economic benefits will eventuate, and the assets can be measured reliably (SAC 4, para. 36).

[4]Infrastructure projects may be publicly-funded or privately-funded. Privately-funded projects may be of three types: (1) BOT (Build, Operate, Transfer), where the private sector builds the facility, operates it for a certain period and then transfers it for no payment to the government. (2) BOO (Build, Own, Operate), where the private sector funds the project, and owns and operates it for a long period. (3) BOOT (Build, Own, Operate and Transfer), where the private sector finances the construction, owns and operates it for a set period and transfers it to the government at no cost at the end. (Public Accounts Committee, 1993, p.xi)

Since infrastructure assets possess service potential which assists the entities to achieve their objectives, there should be little problem that the first recognition criteria will be met. The only argument lies in their reliable measurement. It is beyond the scope of this study to discuss the measurement issue in detail.[5] However, there are various arguments on the measurement of infrastructure (Well, 1981; Perrin, 1984; Engstrom, 1985; Van Daniker and Kwiatkowski, 1986; Fountain, 1987; Walker, 1987; Attmore, et al., 1989; Burns, 1989; Churchill, 1992, 1992a; Rowles, 1992). It seems that it is generally agreed that historical cost, which is deemed to be a reliable measurement, is meaningless to users and irrelevant for decision making. Thus, current valuation would provide a more meaningful basis to users.

AAS29 "Financial Reporting by Government Departments" requires that all assets, including infrastructure assets, are to be recognized in the statement of financial position if they meet the asset recognition criteria (para. 54). AAS29 recommends the use of written down current cost for valuation of infrastructure. The Standard suggests that practical difficulties in reliably measuring the carrying cost of some infrastructure may exist and allows a transition period for entity to overcome the difficulty (para. 65). This implies that reliable measurement of infrastructure will be difficult but not impossible.

[5]The measurement of the elements of financial statements will be addressed by the proposed Statement of Accounting Concepts SAC 5 which may provide a more systematic basis for discussing the measurement issue in detail.

Reporting Requirements on Recognition of Infrastructure

NSW Treasury has issued documents on the reporting requirements on physical non-current assets which are consistent with the definition and recognition criteria set out in SAC 4. "Guidelines for Capitalisation of Expenditure in The NSW Public Sector" (NSW Treasury, 1994) requires recognition of an asset if the definition and recognition criteria for an asset in SAC 4 is met (section 2.1). "Financial Reporting Code Under Accrual Accounting For Inner Budget Sector Entities" (NSW Treasury, 1991) makes it explicit that infrastructure resources are properly viewed as assets of a department since they possess the characteristics of assets defined in SAC 4 (para.4.4). Infrastructure assets are required to be disclosed as a separate class under property, plant and equipment (para. 4.25). Guidelines on the measurement of infrastructure is provided by "Policy Guidelines For Valuation of Physical Non-Current Assets in NSW Public Sector" (NSW Treasury, 1990).

Position of this Study

From the above discussion, the position of this study is that in order to provide useful information to users for decision making, infrastructure assets should be recognized in the financial reports. The possession of particular characteristics does not preclude them from being recognized as assets.

2.5 Disclosure and Users Information Needs

Infrastructure assets generally involve substantial financial resources and are made available to the public. Thus, it is generally believed that there are users of financial reports who will be interested in the infrastructure information. The next question will then be who the users are and what infrastructure information public sector entities should provide to meet users' information needs.

2.5.1 Groups of Users

SAC 2 identifies three groups of users of general purpose financial reports which apply to entities in both private and public sector. Specifically in the case of public sector, the users include:

1. Resource providers such as employees, lenders, creditors, suppliers, parliament, taxpayers and ratepayers.
2. Recipients of goods and services such as customers, ratepayers and taxpayers. This means that user groups might overlap.
3. Parties performing an oversight function such as parliaments, governments, regulatory agencies, analysts, labour unions, employer groups, media and special interest community groups. (paras. 17-19, 21)

A review of the literature (Mautz, 1981; Gaffney, 1986; Van Daniker and Kwiatkowski, 1986; Likierman, 1989; Daniels and Daniels, 1991; Banker, et al.,

1992) showed that there was a variety of users of government financial reports. These included elected officials, civil servants, investors, employees, citizens/taxpayers, customers, suppliers, government, lenders, donors etc. The list is not exhaustive and the user groups are similar to those identified by SAC 2 which provides a more systematic way of analyzing the user groups. Existing reporting requirement documents also identify a wide range of interested parties. For example, NSW Treasury (1991, p.4) suggests that "parties who seek information .... include departmental managers, responsible Ministers, Members of Parliament, policy advisors, the media, users of departmental services, analysts and others". Lists of users identified by various authors in recent years are outlined in Table 2.5.

Van Daniker and Kwiatkowski (1986, p. 38) carried out a survey on users' information needs on infrastructure, and identified five groups of users: academic, investor, management, legislator and citizen. They provided empirical evidence on the list of users of government financial reports. The result revealed that approximately 74 percent of all respondents indicated in the questionnaire that they were governmental report users. This provides a support to the argument that there exists groups of users who are interested in the information in general and on infrastructure in particular.

Table 2.5

Users of Public Sector Financial Reports

SAC 2	Resource providers: employees, lenders, creditors, suppliers, donors, parliament, taxpayers and ratepayers. Recipients of goods and services: customers, ratepayers and taxpayers. Parties performing a review or oversight function: parliaments, governments, regulatory agencies, analysts, labour unions, employer groups, media and special interest community groups.
Mautz, 1981	Management: elected officials, permanent civil servants; employees; investors; citizen-taxpayers; federal government.
Gaffney, 1986	Civic associations; Parent-Teacher Associations; taxpayers, citizen.
Van Daniker and Kwiatkowski, 1986	Academic; investor; management; legislator; citizen.
Likierman, 1989	Elected members; the public or taxpayer; customers or clients; management; customers and suppliers; employees; government; competitors; lenders; donors or sponsors; investors or business partners; other pressure groups.
Daniels and Daniels, 1991	Citizen; investors/creditors; legislative/oversight subjects.
NSW Treasury, 1991	Departmental managers, responsible Ministers, members of Parliament, policy advisors, the media, users of departmental services, analyst and others.
Banker, et al., 1992	Creditors, grantors, taxpayers, voters, legislators, and oversight boards.

In summary, SAC 2 provides a systematic framework to identify the users of public sector financial reports. There are common users identified by various literature as discussed above. From these two sources, users include:

- Resource providers: suppliers, creditors, lenders or investors;
- Recipients of goods and services: citizen or taxpayers;
- Parties performing a review or oversight function: government and regulatory agencies.

This study will emphasize these three groups.

2.5.2 Information Needs on Infrastructure

Purposes For Which Users Require Information

The purpose of general purpose financial reporting is to communicate relevant information to users for decision making. SAC 2 outlines the purposes for which user groups require financial information.

Resource providers need to know whether the entity is achieving the objectives. Taxpayers want to know whether the entity is delivering the services expected of it. Suppliers, creditors and lenders will be interested in the entity's ability to generate cash flow for timely payment of the entity's obligations to them. In general, users will be concerned whether the entity is achieving its objectives economically and efficiently. (para. 21)

Recipients of goods and services need to assess the ability of the entity to continue to provide goods and services in the future, the likely level at which goods and services will be provided, the likely cost of the goods and services and the extent to which the

entity is using resources in their interests. Thus, they want to know whether the entity is achieving its objectives economically and efficiently in the provision of goods and services. (paras. 22, 24)

Parties performing a review or oversight function also need to assess whether the entity is achieving its objectives and is operating economically and efficiently. (para. 25)

Information on infrastructure helps users to determine whether there are potential financial overruns for capital projects that might impair the financial condition of the entity (Fountain, 1987a, p.101). It also helps users to determine the physical condition of the infrastructure facilities, the standard of the services, whether they are maintained at an acceptable level of service and the impact of capital assets requirements on future budgets (Attmore, et al., 1989, p.15). In this regard, information on infrastructure will help users to assess whether the entity is achieving its objectives and is operating economically and efficiently.

Since users require information for making and evaluating resource allocation decisions, the next question is what types of information are relevant to users' needs. SAC 2 (para 28) suggests that the particular information users require will overlap since all users will be interested, to varying degrees, in assessing (1) the efficient operation of the entity, (2) the ability of the entity to continue providing goods and services, and (3) the use of resources for intended purposes. Thus, information about

the entity's performance, financial position, financing and investing, and compliance will be useful for these purposes.

For government departments, both financial and non-financial information will be required by users for decision making. AAS29 (para. 22) suggests that:

> Government departments are usually primarily responsible for the achievement of service delivery objectives within certain financial constraints. Accordingly, decisions about the allocation of scarce resources to government departments will be influenced by past achievements in, and future requirements for, the delivery of services of a particular type, quality and volume. Therefore, both financial and non-financial information will be required by users for economic decision making....

SAC 2 (paras. 30 and 31) also suggests that:

> Non-financial measures of performance may also be relevant to users for the purposes identified, particularly in relation to non-business entities.
>
> In the public sector, information about government policies that affect a reporting entities' operations may be relevant to assessments of performance.

Thus, to meet users' information needs, disclosure of both financial and non-financial information by public sector entities is useful to users.

The disclosure of the types of information on infrastructure is not specified by the accounting concepts or the accounting standards. A review of various literature suggests that both financial and non-financial information on infrastructure will be useful to users.

Financial Information

In terms of financial information, the major issues concern (1) recording infrastructure as assets; (2) the valuation of infrastructure; (3) the maintenance problem and (4) the cost of consumption and (5) budget and actual cost information.

Whether to record infrastructure as assets in the financial reports has been discussed in section 2.3.3 above. It is considered necessary to recognize infrastructure as assets so as to meet users' information needs. The related issue is how to measure infrastructure, that is, what monetary amount should be reported. It is generally agreed that historical cost is irrelevant to users. Burns (1989, p.14) suggested the use of current valuation basis. Engstrom (1985, p.301) suggested the use of both historical cost and current cost for management purpose.

Rowles (1992, pp. 61, 67) considered that measurement should reflect the current economic cost of the assets so as to be consistent with the conceptual framework. Since infrastructure generally will not be replaced by similar assets, current

reproduction cost or replication cost would be appropriate. AAS29 (para 65) also recommends the use of written down current cost.[6]

Van Daniker and Kwiakowski (1986, pp.113-114) provided empirical evidence that replacement cost was preferred to historical cost by users and replacement cost was most useful in forecasting the cost of replacing infrastructure. Thus, to be useful to users, infrastructure measured at current cost should be reported.

For infrastructure, the level of maintenance is a major concern to users and they will be interested in updated information on maintenance of infrastructure so as to assess the standard of services provided. This concern is addressed by a number of authors (Engstrom, 1985; Van Daniker and Kwiakowski, 1986; Currie, 1987; Burns, 1989; Attmore, et al., 1989).

Apart from maintenance expenditure, another aspect that will be of interest to users is deferred maintenance. This is defined by Van Daniker and Kwiatkowski (1986, p.116) as:

> Delayed repairs and upkeep that would be required to restore an asset to its normal operating capacity.

[6] The determination of current cost is discussed in Statement of Accounting Practice SAP 1 "Current Cost Accounting" and Guidance Notes on Statement of Accounting Practice SAP 1, paras. 47-53. See also "Definition, Recognition and Measurement of Non-current Physical Assets by Public Sector Reporting Entities: A Guide to Applying Professional Pronouncements", AARF, 1992, pp.40-41.

Another way of defining deferred maintenance is provided by Marquette, et al., (1988, p.14):

> By definition, deferred maintenance is maintenance which was not done. The cost of deferred maintenance can be defined as either the marginal cost of bringing the asset back to full capacity or an increase in the rate of depreciation.

The research carried out by Van Daniker and Kwiatkowski (1986, p.112) indicated that most of the users demand that deferred maintenance information be presented in financial reports. The disclosure of deferred maintenance information will provide new and important information to users, that is, the effect of not providing resources for maintenance (Attmore, et al., 1989, p.14; Fountain, 1987a, p.101). Although there is argument against the presenting of deferred maintenance (Rowles, 1992, p.59), this piece of information will help users to assess whether the government entity is using its resources efficiently and effectively in achieving its objectives.

Other financial information which is useful to users include cost of consumption of the assets, budget and actual cost information. There are various arguments on cost of consumption. For example, Rowles (1991, 1992, 1993) supported the use of depreciation as a measure of cost of consumption of assets since infrastructure, similar to other physical assets, are subjected to decay and wear out. Currie (1987, p.8) proposed the use of renewal accounting, instead of depreciation accounting, by which he argued the cost of maintenance and renewal, if they are up to date, should equal to

the cost of consumption. Burns (1993, pp.89-104) suggested the use of condition-based direct assessment of depreciation as an alternative to the traditional formula-depreciation and renewal accounting. By condition-based depreciation, the difference between the beginning and end of year assessment represents the amount of infrastructure deterioration. Despite the arguments about the measure of cost of consumption, it is considered that the information however measured should be disclosed in order to meet users' information needs.

Budget and actual cost information is also considered to be useful to users. Van Daniker and Kwiatkowski (1986, p.118) recommended the disclosure of five years of prior-period budget to actual information in the financial reports.

Non-financial Information

The non-financial type of information required by users includes (1) the physical condition of infrastructure and (2) the entity's asset planning and management information. This will help users to determine how well infrastructure assets are being maintained, the ability of the entity to continue providing infrastructure facilities at an acceptable standard and the ability of the entity to achieve its objectives.

In regard to the physical condition, Van Daniker and Kwiatkowski (1986, p.76), and Attmore et al. (1989, p.14) found that users are interested in the replacement cycle, aging schedule of infrastructure and whether they are in good working condition..

Burns (1987, p.117) also suggested that the aging of infrastructure is a real concern and Currie (1987, p.9) suggested that information on standards of services should be provided. Thus, an assessment of the asset condition will be useful to users for decision making.

Assets planning information provides users with information about the future plans of the entity. These include information about the estimates of resources that are expected to be available, projects or programs expected to be undertaken (Van Daniker and Kwiatkowski, 1986, p.71), an infrastructure assets management plan, the capacity level required and achieved (Currie, 1987, p.9), and an assessment of the infrastructure needs (Attmore et al, 1989, p.14). Such information helps to account for the planning and management of infrastructure assets. Previous studies (Van Daniker and Kwiatkowski, 1986; Hay and Antonio, 1990) indicated that users found assets planning information and engineering information very useful to them.

Summary

In general, users require infrastructure information to assess the operations of the entity. The types of information which are considered useful to users by various authors are outlined in Table 2.6. Generally, information required by the three groups of users, resource providers, recipients of goods and services, parties performing an oversight function, will overlap as pointed out in SAC 2 (para. 28). The types of general and infrastructure information considered useful to the three groups of users

are outlined in Table 2.7. These information needs are identified by reference to the literature.

Table 2.6

Types of Information Considered Useful to Users by Various Authors

	Financial Information	**Non-financial Information**
Engstrom, 1985	- Both historical cost and current cost of infrastructure assets - Maintenance of infrastructure assets	
Gaffney, 1986		- Capital improvement projects
Van Daniker and Kwiatkowski, 1986	- Deferred maintenance - Historical cost is not needed - Replacement cost - Constant dollar cost is not needed - Budget to actual information for five years	- Financial plans information - Engineering information
Burns, 1987	- Replacement or maintenance of infrastructure - Rate of assets consumption	- Aging of infrastructure
Currie, 1987	- Maintenance information - Renewal expenditure - Enhancement expenditure - current cost	- Capacity level required and achieved - Standards of services - appraisal of asset condition - Infrastructure assets management plan
Attmore, et al, 1989	- Historical cost is meaningless - Budget and actual expenditures including estimated total costs of capital projects - expenditure for maintenance	- Replacement cycle and aging schedule of capital assets - capital project plans - assessment of condition - anticipated infrastructure needs
Burns, 1989	- Level of maintenance required to keep infrastructure at acceptable standards - Accrual accounting on current valuation basis	- Standards of services
Hay and Antonio, 1990		- Relationship of the changes in capital assets to the entity's capital improvement program
Rowles, 1991, 1992, 1993	- Spending on assets - Stock of assets - Cost of consumption of service potential - depreciation - reproduction cost or replication cost	

Table 2.7

Type of Information Considered Useful to Various User Groups

	Resource Providers		Recipients of Goods and Services		Parties performing an oversight function	
	General Information needs	**Infrastructure Information needs**	**General Information needs**	**Infrastructure Information needs**	**General Information needs**	**Infrastructure Information needs**
Mautz, 1981	-Entity's ability to meet future commitment				-Spending of allocated fund	
Gaffney, 1986				-Capital improvement projects		
Van Daniker and Kwiatkowski 1986		-Engineering information, replacement cycle and aging schedule -Financial Plan -Replacement cost -Budget to actual spending		-Engineering information, replacement cycle and aging schedule -Financial Plan -Replacement cost -Budget to actual spending		-Engineering information, replacement cycle and aging schedule -Financial Plan -Replacement cost -Budget to actual spending
Green, 1987			-Operating deficit			
Attmore et al., 1989	-Use of debt and related proceeds -Financial condition -Entities' ability to meet future commitment	-Service capacity of assets -Continuing cost to operate and maintain the assets		-Anticipated infrastructure needs -Capital project plans -Maintenance expenditure -Deferred maintenance -Assessment of assets condition		
Likierman, 1989	Organization plan and position -Prospect and long and short term commitment		-Budget and actual spending -Distribution of resources		-Aspects of the work of the entity	
Daniels and Daniels, 1991	-Viability and performance		-Cost of services		-Cost of services -Compliance	
Kemmet, 1993			-Operating deficit			

Summarizing the ideas, the types of infrastructure information that meet users' information needs include financial information, physical condition of infrastructure and assets planning and management information. A summary of this information is outlined in Table 2.8. The infrastructure information which is considered useful to users by various literature will be used to measure the extent of infrastructure disclosure by public sector entities and the list of infrastructure information in Table 2.8 will be used to develop the disclosure score in Chapter 4.

Table 2.8

Summary of the Type of Information on Infrastructure Considered Useful to Users

Financial Condition
Capitalization of infrastructure in the balance sheet
Valuation of infrastructure
Cost of consumption / renewal expenditure/depreciation
Expenditure for maintenance
Deferred maintenance
Enhancement expenditure
Budget and actual expenditure including estimated total costs of capital projects
Physical Condition
The replacement cycle and aging schedule
Standard of service / assets condition
Assets Planning and Management
Anticipated infrastructure needs
Capital project plans
Infrastructure asset management plans
Capacity level required and achieved

2.6 Conclusion

This chapter consists of four parts. The first part outlines the conceptual framework project relevant to this study which is used as a frame of reference and forms the foundation of this study. In the second part, public sector entities are defined and classified into general government departments and government business enterprises. Infrastructure is defined in the third part. Issues on the characteristics and recognition of infrastructure are discussed. It is considered that infrastructure should be recognized as assets in the financial reports. In the fourth part, the disclosure of infrastructure and the infrastructure information required by users is discussed. It is concluded that there are users who are interested in the information on infrastructure. Different groups of users are identified by reference to SAC 2 and their information needs are discussed by reference to related literature and previous research

In Chapter 3, hypotheses will be developed to evaluate whether the disclosure of infrastructure information by public sector entities meets users' information needs as discussed in this chapter.

CHAPTER 3 HYPOTHESES DEVELOPMENT

3.1 Introduction

In this chapter, hypotheses to test the disclosure practice of infrastructure by the public sector entities are developed. Given that the objective of general purpose financial reporting is to provide useful information to users for decision making, the hypotheses are developed in a way that will evaluate the infrastructure disclosure against users' information needs. Three hypotheses are developed to achieve the first objective of this study, another three hypotheses are developed to achieve the second objective.

3.2 Disclosure and Users Needs Hypotheses

As stated in Chapter 1, objective (1) of this study is to determine whether public sector entities disclose information on infrastructure which is considered useful to meet users' information needs. In order to achieve this objective, three hypotheses are developed.

3.2.1. Useful Information Disclosure Hypothesis

In Chapter 1, it has been argued that infrastructure is a significant asset in the public sector, involving a considerable amount of the scarce financial resources. In Chapter 2, it has also been established that there are users who are interested in the infrastructure information provided by the public sector entities. Thus, it is considered necessary for public sector entities to disclose information on infrastructure which is useful to users. Information on infrastructure which is considered useful to users has been discussed in Chapter 2.

In this study, the level of infrastructure disclosure by the public sector entities will be evaluated against the extent of users' information needs on infrastructure. A list of items (13 items)[7] which are considered to be useful to users by the literature has been outlined in Table 2.8 earlier. Infrastructure disclosure will be tested against this list of items. Thus, the higher the level of disclosure, the better users' information needs are met.

If the public sector entities are to satisfy the objective of general purpose financial reporting as stated in SAC 2, in order to meet users' information needs, all the 13 items of infrastructure information will be disclosed, that is, at full disclosure level. Thus, the following hypothesis can be developed:

[7]This list of 13 items will be used to develop the disclosure score for hypotheses testing. This will be discussed in detail in Chapter 4.

H1: The public sector entities' annual reports disclose information on infrastructure at full disclosure level.

3.2.2 Disclosure and Types of Entities Hypothesis

In this section, a hypothesis is developed to test whether particular type of public sector entities disclose more infrastructure information than the other type of public sector entities. In section 3.2.1, it is established that the higher the level of disclosure, the better users' information needs are met. In this section, the disclosure level of different types of public sector entities is compared. It can be inferred from the comparison whether a particular type of public sector entities meets users' information needs on infrastructure better.

From Chapter 2, public sector entities are classified into general government entities and government business enterprises. These two types of entities are different in their scope, operation, consumers, source of finance and objective of operation. It has argued that government business enterprises are delegated authority to carry on a business and they generate most of their revenue from the sale of goods and services to the public. Thus, it is reasonable to expect that there will be more demand on government business enterprises than general government entity by users for information.

The fact that government business enterprises adopt the private sector commercial principles of financial reporting and there are debates on the financial reporting

system and performance measurement of government business enterprises (Roy, 1988; Miah, 1989, 1990; Fellew and Kelaher, 1991) indicate that government business enterprises receive more attention on their financial reporting, thus under greater pressure to disclose more information to meet users' needs. This leads to the following hypothesis:

H2: The annual reports of government business enterprises disclose more information on infrastructure assets than the annual reports of general government entities.

The distinction between general government entities and government business enterprises may be subjected to judgement. On examining the differences between these two types of entities, which are shown in Table 2.2 earlier, it seems that the more objective and operational criteria for identifying government business enterprises is the source of finance. Government business enterprises recover a significant portion of their operating costs from gross trading receipts. That is, at least 50% of their operating costs will be recovered from gross trading receipts (Australian Bureau of Statistics, 1987, p.27). This criterion is used to separate public sector entities into general government entities and government business enterprises for the purpose of testing this hypothesis. The criterion for such classification is discussed in detail in Chapter 4.

3.2.3. Disclosure and Types of Infrastructure Hypothesis

In this section, a hypothesis is developed to test whether public sector entities providing a particular type of infrastructure disclose more infrastructure information than the other public sector entities providing the other types of infrastructure. It has been established that higher level of disclosure indicates that user' information needs are better met. In this section, the disclosure level of the public sector entities providing different types of infrastructure is compared. It can be inferred from the comparison whether entities providing particular type of infrastructure meet users' information needs on infrastructure better.

As discussed in chapter 2, infrastructure can be summarized into four main types for the purpose of this study, they include transport, water, electricity, and other public facilities. The disclosure by entities providing these four types of infrastructure is compared.

There is a lack of empirical evidence on the disclosure practice by entities providing different types of infrastructure. Thus it is difficult to predict whether entities providing particular type of infrastructure will meet user' need better by disclosing more infrastructure information useful to users. Given that the objective of financial reporting is to provide useful information to users for decision making, it is expected that there is no difference in the level of disclosure by these entities in order to satisfy the objective of general purpose financial reporting. This leads to the following hypothesis:

H3: There is no difference in the level of disclosure on infrastructure among the public sector entities providing transport facilities, water facilities, electricity facilities and other public infrastructure facilities.

3.3 Disclosure and Interests of User Groups Hypotheses

As stated in Chapter 1, objective (2) of this study is to determine whether the level of disclosure of infrastructure assets relates to the interests of particular group of users. In order to achieve this objective, three hypotheses are developed to test the relationship between the level of infrastructure disclosure and the interests of the three group of users, that is, resource providers, recipients of goods and services, and parties performing an oversight function.

3.3.1 Disclosure and Resource Providers' Interests Hypothesis

In this study, focus is on the interests of creditors, suppliers, lenders or investors as resource providers of the public sector entity. SAC 2 (para. 21) suggests that for providers of resources to public sector entities, for example, suppliers, creditors and lenders, they "will principally be interested in the entity's ability to generate cash flows for timely payment of the entity's obligations to them". This is considered to be the major purpose of this group of users to require information from the financial reports of the entities. Giroux and Deis (1993, p.64) indicated that from the perspective of the investors/creditors, "the ability of the government to pay its debts is

crucial". Attmore, et al. (1989, p.14) suggested that creditors are interested in information about the entity's use of debts and the ability of the entity to meet its future obligation. Mautz (1981, p.58), and Daniels and Daniels (1991, p.29) also shared similar ideas.

Previous studies showed that there existed a relationship between investor/creditor interests and government reporting disclosure. Giroux and Deis (1993) carried out an analysis on the relationship between investor interests and government reporting disclosure. They analyzed investor incentives on both the annual report and annual operating budget. It was found that investor interests are more closely related to the annual report than the budget. Annual report is of particular interest to investors and creditors (p.74).

Ingram (1983) examined the association between state government reporting practices and creditor decisions. It was found that reporting practices were not directly related with bond risk and return measures but indirectly related as a result of their effect on bond rating. (p.16) This demonstrates that the relationship between reporting practice and creditor decision is still an important issue.

In Giroux and Deis's study, the surrogates for investor needs were four types of variables: financial ratios, structural factors, regulation, and external evaluation of disclosure and creditworthiness. The existence of a Certificate of Achievement (external evaluation variable) was found to be a significant variable in annual report disclosure. When this variable was excluded, then the level of debt became

significant. It was concluded that debt provided the greatest incentives for investor related disclosure. (p.73)

Long-term debt has been considered an important disclosure factor in various literature and has been used to test for reporting disclosure incentive. Positive and significant results were found in a number of studies (Ingram and Copeland, 1982; Evans and Patton, 1983, 1987; Cheng, 1992; Giroux and Deis, 1993). However, insignificant results were also found in certain studies (Baber and Sen, 1984; Ingram, 1984).

In order to test the relationship between infrastructure disclosure and resource providers' interests, a surrogate for the interests of resource providers is selected using the following criteria[8]:

1. The factor represents the interests of the users.
2. The factor is to be found in the annual reports of the entities since other source of data will be difficult to obtain for individual entity.
3. The factor should be common to all entities in order to rule out the possibility of missing data in statistical test.

In this case, debt level will be used as a surrogate for resource providers' interests for the following reasons:

[8]These criteria will also be used to select the surrogate for the interests of recipients of goods and services and parties performing an oversight function in later sections.

1. Since the primary interest of this group of resource providers is the ability of the entity to repay its obligations to them, they are interested in the debt related information of the entity for decision making.
2. The provision of infrastructure involves huge amount of financial resources, the problem of funding is a major issue concerning infrastructure. Debt represents source of external funding to the entity and will be likely to have an effect on the incentive of the entity to disclose more information.
3. Other factors, such as a Certificate of Achievement or credit rating, which were found to be important factors in various research, would be irrelevant to this study.

For the purpose of this study, debt level will be measured in terms of total debt over total revenue. Total debt is used instead of long term debt for two reasons: (1) total debt is a more comprehensive factor to cover the interests of resource providers. In a previous study, total debt outstanding was found to be the most important factor in evaluating municipal securities by banks (Boyett and Giroux, 1978). (2) Not all entities disclose long term debt in their annual reports. Thus total debts is a more feasible measure.

Total debt will be expressed as a rate of total revenue. Total assets will not be used because (1) as most public sector entities started to adopt the accrual basis of accounting this year or just recently, it is questionable whether all public sector assets were accounted for in the statement of financial position. The different valuation basis adopted will also affect the representativeness of the total resources held by the

entity. Thus, total revenue will be a more accurate reflection of the resources available to the entity or the size of the entity. (2) The use of total revenue is found in previous research. Ingram (1983) used the ratio of long-term debt over total revenue as one of the financial ratios to test the relationship between government reporting practice and creditor decisions. (3) The use of per capita figure, as used in other research, would be irrelevant since this study examines individual entity within a state.

It is argued that the ability of governments to raise debt at the lowest possible cost depends, in part, on full disclosure of information demanded by investors. Thus, as the level of debt increases, governments have greater incentives to increase disclosure levels. (Giroux and Deis, 1993, p.68) It is also argued that larger dependency on external funding sources could lead to increased disclosure. Since debt level is used as a surrogate for resource providers' interests in this study, it can be expected that infrastructure disclosure level will be higher when the entity's level of debt is higher. This leads to the following hypothesis:

H4: Entities with higher level of debt disclose more information on infrastructure than entities with lower level of debt.

If the relationship between the level of infrastructure disclosure and the debt level (resource providers' interests) is positive and significant, it can be concluded that public sector entities have an incentive to serve the interests of resource providers and thus disclose more infrastructure information in their interests.

3.3.2 Disclosure and Recipients of Goods and Services' Interests Hypothesis

Recipients of goods and services include citizens or taxpayers. They are interested in the ability of the entity to continue to provide goods and services in the future, the likely level of goods and services to be provided, and the likely cost of the goods and services (SAC 2, para. 22).

There is limited research on the relationship between reporting disclosure and citizens/ taxpayers' interests. Previous research on citizens/ taxpayers' information needs generally found it difficult to identify the citizen group who are really interested in government financial reports. Thus, citizens/ taxpayers organizations are used to represent the interests of citizens/ taxpayers (Gaffney, 1986; Van Daniker and Kwiatkowski, 1986; Green, 1987; Daniels and Daniels, 1991; Hay, 1994).

From previous studies, various information is found to be of interests to citizens/ taxpayers. These include financial plans (Van Daniker and Kwiatkowski, 1986, p.96), capital improvement project (Gaffney, 1986, p.184), cost of services (Daniels and Daniels, 1991, p.29), operating deficit (Green, 1987, p.209; Kemmet, 1993, p.110). Information specific to infrastructure such as maintenance information, capital project plans are of interests to citizens/ taxpayers (Attmore, et al, 1989, p.14; Van Daniker and Kwiatkowski, 1986, p.70).

In selecting a surrogate for the interests of citizen/ taxpayer group, the criteria set out in section 3.3.1 of this study are followed. Operating results of the entity are used as the surrogate for the following reasons:

1. While capital expenditure or maintenance costs on infrastructure can improve the quality of the infrastructure provided, and thus of specific interest to citizen/ taxpayer group, it is doubtful whether these will be provided in the annual reports as there is no mandatory requirements to do so. Thus, it may be difficult to obtain such data for all entities.
2. Similarly for financial plans or capital project plans which are found to be useful to citizens/ taxpayers group, it is not certain whether entity will provide this information in the annual report as there is no mandatory requirements to do so.
3. Operating results of the entity are of interest to citizen/ taxpayer group since it indicates the ability of the entity to continue to provide goods and services at an acceptable standard. An entity with operating deficit may postpone capital improvement projects (Kemmet, 1993, p.110) or reduce maintenance expense, thus affecting the quality of infrastructure.

Citizens/ taxpayers are especially interested if the entity has an operating deficit since this will affect their interests in consuming the goods and services in the future. Thus, it is expected that citizen/ taxpayer group will demand more information if the entity has an operating deficit (total expenditure greater than total revenue) so as to assess the financial condition of the entity. In Green's article (1987, p.209), the citizen-

taxpayers organization assessed the government's finances and made the following recommendation:

> First, annual GAAP-based operating balance is needed to stop further growth of the $4.3 billion accumulated deficit and cap the amount of spring borrowing. Second, GAAP-based balance must be achieved annually. To ensure this, the CBC (Citizens Budget Commission) endorsed a constitutional amendment that would require all future budgets to be so balanced.....The newly incurred deficit must be financed within five years. The third recommendation called for the state to implement a deficit reduction program.

This demonstrates the concern of the citizen/ taxpayer group when the public sector entity has a deficit. Specifically, this will affect the quality of infrastructure and the ability of the entity to maintain the infrastructure in good condition. It is expected that an entity with higher operating deficit will be under the pressure to disclose more information to meet the demand of the citizen/ taxpayer group.

Operating results will be measured in terms of total expenditure over total revenue. An excess of total expenditure over total revenue represents the level of operating deficit. This leads to the following hypothesis:

H5: Entities with higher level of operating deficit disclose more information on infrastructure than entities with lower level of operating deficit.

A positive and significant result will indicate that entities have an incentive to serve the interests of recipients of goods and services and thus disclose more infrastructure information in their interests.

3.3.3 Disclosure and Parties Performing Oversight Function's Interests Hypothesis

Parties performing an oversight function are interested in whether the entity is achieving its objective and is operating economically and efficiently (SAC 2, para. 25).

Research on the relationship between reporting disclosure and the interests of parties performing an oversight function is limited. Literature is found on discussing the interests and information needs of this group of users. Likierman (1989, p.13) suggested that governments were interested in the aspects of the work of a public sector body to which they had responsibility. Mautz (1981, p. 60) suggested that federal government was interested in the spending of the allocated fund. Daniels and Daniels (1991, p.29) conducted empirical research which found that legislative/oversight officials rated information on compliance and cost of services most useful. Van Daniker and Kwiatkowski (1986, p.96) found that for the legislator group, a financial plan was the most useful information to them.

The findings and discussion in this literature are inconsistent. This may suggest that parties performing an oversight function are interested in a broader range of information to assess the operation of the entity as a whole. Thus, this study selects a

surrogate for the interests of parties performing an oversight function which will represent, as far as possible, this broad range of interests.

Size of an entity has been used as a factor relating to regulation and reporting disclosure. Buzby (1975, p.19) argued that larger firms were more closely watched by various government agencies and thus will report more information to reduce undesired pressures from the government. Firth (1979, p.279) also argued that larger firm were more in the public eye and had to keep the confidence of regulatory bodies. Evan and Patton (1983, 1987) used population to test the incentive of municipalities to participate in Certificate of Conformance program. Ingram (1984) also used population as a surrogate for the complexity of government to test the incentive of government reporting disclosure.

Ingram (1984) and Cheng (1992) used intergovernment funding as a surrogate for federal government influence. It was argued that government funding served as an external constraint which led to higher disclosure, or on the other extreme, it may insulate the entity from the need to report more information.

In this study, size is used as a surrogate for the interests of parties performing an oversight function for the following reasons:

1. Size is considered in various literature to be related to external regulation and compliance.

2. Intergovernment funding may lead to either more disclosure or less disclosure. The inconsistent results will make it difficult to analyze the relationship between the disclosure practice and the interests of parties performing an oversight function.

Size of the entity will be measured in terms of total revenue. The reason has been mentioned in section 3.3.1 above, being that most public sector entities adopted accrual accounting this year or only recently. Total revenue would be a more accurate reflection of the sources available to the entity as compared to total assets.

Previous research indicated that there was a positive relationship between size and reporting disclosure. In relation to infrastructure information, it is also expected that larger entities will attract more attention by the parties performing an oversight function and thus will disclose more infrastructure information. This leads to the following hypothesis:

H6: Larger entities disclose more information on infrastructure than smaller entities.

A positive and significant result will indicate that public sector entities have an incentive to serve the interests of parties performing an oversight function and hence will disclose more infrastructure information in their own interests.

3.4 Conclusion

In this chapter hypotheses for statistical testing were developed. Six hypotheses relating to the objective of this study were developed. The first three hypotheses test whether the annual reports of public sector entities disclose infrastructure information which is considered useful to users. The fourth to sixth hypothesis test the relationship between the disclosure level and the interests of user groups.

In Chapter 4, the procedures for selecting the research sample and collection of data will be presented. The variables and the statistical tests of the hypotheses will be discussed.

CHAPTER 4 EMPIRICAL RESEARCH METHODS

4.1 Introduction

In this chapter, the research population is defined and the procedures taken to select the research sample are described. Then the data collection process is stated and variables used in the hypothesis testing are discussed. Finally, the statistical tests used for each hypothesis are explained.

4.2 Generating The Research Sample

"Public sector entities" were defined in Chapter 2. For the purpose of this study, the population to be studied includes:

(1) public sector entities in New South Wales, including government departments and statutory bodies;

(2) public sector entities in (1) above which currently in their services provision use infrastructure as defined in Chapter 2 section 2.4.1, that is, transport and communication, water work systems, electricity and gas systems, government buildings and other public facilities.

Thus, (2) is a subset of (1). The definition of infrastructure adopted in this study delineates the population to be studied.

The sampling method adopted in this study is based on the stratified sampling approach. The following procedures were taken to select the sample:

(1) A list of the most recent government departments and statutory bodies in New South Wales as found in the New South Wales Government Directory 1994 was obtained. The Directory is arranged according to ministerial portfolio. There are a total of 31 portfolios in the Directory.

(2) Ministerial portfolios relating to the four types of infrastructure groups (transport and communication, water work systems, electricity and gas systems, government buildings and other public facilities) defined above were located. 12 portfolios were relevant which consist of 98 entities in total.

(3) Not all entities under these 12 portfolios are related to the four types of infrastructure groups, for example, entities relating to wild animals, crime and emergency services. These entities were excluded. In addition, the administration bodies and advisory committees of these four groups were eliminated, leaving 43 entities which satisfied the above two conditions.

(4) All the 43 entities were selected for the study.

4.3 Data Collection

The data source of this study is the annual reports of these 43 entities for the year ended 30 June 1993. 17 of these annual reports were available in the University of New England library. Letters were sent to the remaining 26 entities requesting for their latest annual reports. No response was obtained from 4 entities. Among the 22 entities to which request letters were sent, one entity (Sydney's Eastern Creek

Raceway) replied that there was no separate annual report for that entity. Another entity (Cobar Water Board) replied that the latest annual report available was 1992. On examining the annual reports, it was found that 99% of the gas facilities in New South Wales is supplied by private sector companies, and 1% supplied by local governments. Thus, the annual report of Gas Council of NSW has been excluded. This makes a total of 37 annual reports available for examination. A list of these 37 entities is in Appendix 1.

Data on the disclosure score are collected from the annual reports of these entities. Data on the surrogates for the interests of user groups (total revenue, total liabilities, total expenditure) are also obtained from the annual reports of these entities. A data collection form for individual entity is designed for this purpose so that data are collected in a systematic manner. A sample of the data collection form is provided in Appendix 2.

4.4 Variables

The variables used in the hypotheses developed in Chapter 3 include the disclosure score, types of entities, types of infrastructure provided by entities and user groups' interests. This section includes a discussion of the development of the disclosure score to measure the level of disclosure on infrastructure information. Concerning the types of entities and the types of infrastructure, discussion is focused on how public sector entities and entities providing different types of infrastructure are classified. The surrogates to measure the interests of user groups are also discussed.

4.4.1 Disclosure Score

In this study, the level of infrastructure disclosure by entities is measured by a disclosure score. Information on infrastructure which is useful to users is scored. The selection of items of infrastructure information and the development of the scoring system is further discussed in this section.

Information on Infrastructure

The disclosure score to measure the level of infrastructure disclosure is based on the information on infrastructure which is considered to be useful to users. Items of information on infrastructure can be obtained by two sources: (1) by survey of users needs, (2) from the literature and previous research.

The first source will provide empirical evidence on users' information needs and will provide stronger support to the validity and objectivity of the disclosure index. But it is more time consuming and has the risk of non-response (Emory and Cooper, 1991, p.333). A survey of users' information needs on infrastructure is, in fact, an extensive work which may be considered a separate research issue. Thus, this study will employ the second source, selecting items of information on infrastructure from the literature and previous research.

Information on infrastructure which is considered useful to users has been discussed in Chapter 2. The development of the score is based on the 13 items as shown in Table 2.6 earlier.

The Scoring System

The scoring system for the 13 items is developed by reference to the system used by Robbins and Austin (1986, p.416). They employed a four-point percentage scale to assign score for 27 information items. The scale was based on whether the disclosure of an information item was dichotomous, qualitative, or qualitative-quantitative. Dichotomous item was assigned a score of zero or 100%. Qualitative item was assigned a score of zero, 25%, 50%, 75% or 100% depending on the number of words contained in the disclosure. Qualitative-quantitative item was assigned a score of 25% or 50% based on the number of words, and the score was increased by 25% or 50% if summary or detail quantitative information was disclosed.

In this study, the 13 items of infrastructure information consist of both financial (quantitative) and non-financial (quantitative, qualitative or qualitative-quantitative) information. The scoring system used is based on the types of information, whether it is quantitative, qualitative or qualitative-quantitative.

The scoring system is based on a scale of 0 to 4. The dichotomous type of scaling limits the discrimination power of the index. Such limitation was discussed by Moore and Buzby (1972, p.582):

> Even if specific criteria were set up, the apparent "all or nothing" structure for awarding points weakens the index's ability to discriminate.....No flexibility is provided for the wide variation that could take place among firms in disclosing such an item. Perhaps, a better method would be to allow for variable points based on the amount of detail presented.

Thus a five-point scale is adopted for this study. The reason was well explained by Nobes (1984, p.80):

> .....it compromised between a smaller scale, which would have restricted differentiation, and a larger scale, which would have exaggerated the fineness with which judgement is possible.

A zero score is assigned to an item if there is no disclosure. The score of 1 to 4 is assigned based on the detail of information disclosed. Quantitative type of information is scored according to the detail of disclosure and the method of disclosure. For example, if infrastructure is recognized as assets, a score is assigned depending on whether an aggregate amount is shown or each item is shown separately, and whether there is separate disclosure in the balance sheet or notes to the accounts. A score of 1 is assigned if only an aggregate amount is shown and there is no separate disclosure in either the balance sheet or notes, a score of 2 is assigned if an aggregate amount is shown separately in notes, a score of 3 is assigned if each item is shown separately in notes, a score of 4 is assigned if there is separate disclosure in the balance sheet and each item is shown separately in notes.

Qualitative type of information is scored according to the number of words contained in the disclosure. The score for qualitative-quantitative type of information is based on both the number of words in the disclosure and whether quantitative data are in summary or detail form. A score of 1 is assigned if only qualitative data are provided, a score of 2 is assigned if qualitative data and summary quantitative data are provided, a score of 3 is assigned if qualitative data and detail quantitative data are provided or if more qualitative data and only summary quantitative data are provided, a score of 4 is assigned if more qualitative data and detail quantitative data are provided. Similar scoring methodology was used by Buzby (1974, p. 429; 1975, p.26) and Wiseman (1982, p.55). The details of the basis of scoring for each item is provided in Table 4.1. This is similar to the morphology form of scoring method used by Nobes (1984, p.81).

The basis of scoring shown in Table 4.1 was modified after a pilot test of five entities had been done so as to make the scoring basis as applicable as possible and allow for discrimination between the level of disclosure among entities.

Data on the quantitative type of items are collected in the financial statements of the entities. These are found in the annual reports, including the income and expenditure statement, balance sheet, cash flow statement, budget and notes to accounts. Data on the qualitative type of items are collected from all other parts of the annual reports.

Table 4.1

Basis of Scoring for the Disclosure Items

Items	Type	0	1	2	3	4
Capitalization of infrastructure in the Balance Sheet	QN	No disclosure	Aggregate amount, no separate disclosure in B/S	No separate disclosure in B/S but disclosed separately in notes, no breakdown for each item	No separate disclosure in B/S but breakdown for each item in notes to accounts	Separate disclosure in B/S with break down for each item in notes to accounts
Valuation of infrastructure	QN	Not mentioned	Historical cost	Current value for some items only	current value for all items at aggregate amount	Current value for each item separately
Cost of consumption/ renewal expenditure/ depreciation	QN	No disclosure	Aggregate amount, no separate disclosure	Separate disclosure but no breakdown for each item	Separate disclosure with breakdown for each item	Separate disclosure with breakdown for each item and explanation
Maintenance expenditure	QN	No disclosure	Aggregate amount, no separate disclosure	Separate disclosure but no breakdown for each item	Separate disclosure with breakdown for some items	Separate disclosure with breakdown for each item
Deferred maintenance	QN	No disclosure	Aggregate amount, no separate disclosure	Separate disclosure but no breakdown for each item	Separate disclosure with breakdown for some items	Separate disclosure with breakdown for each item
Enhancement expenditure	QN	No disclosure	Aggregate amount, no separate disclosure	Separate disclosure but no breakdown for each item	Separate disclosure with breakdown for some items	Separate disclosure with breakdown for each item
Budget and actual expenditure including estimated total cost of capital projects	QN	No disclosure	Summary data for less than 5 years	Summary data for 5 years	Detail data for less than 5 years	Detail data for 5 years
Replacement cycle and aging schedule	QL-QN	No disclosure	Below 50 words	Below 50 words and with summary quantitative data	Below 50 words with detail quantitative data or over 50 words and with summary quantitative data	Over 50 words and with detail quantitative data

Standard of service/ asset condition	QL-QN	No disclosure	Below 200 words	Below 200 words and with summary quantitative data	Below 200 words with detail quantitative data or over 200 words and with summary quantitative data	Over 200 words and with detail quantitative data
Anticipated infrastructure needs	QL	No disclosure	Below 100 words	101-200 words	201-300 words	Over 300 words
Capital project plans	QL	No disclosure	Below 100 words	101-200 words	201-300 words	Over 300 words
Infrastructure assets management plans	QL	No disclosure	Below 100 words	101-200 words	201-300 words	Over 300 words
Capacity level required and achieved	QL	No disclosure	Below 100 words	101-200 words	201-300 words	Over 300 words

QN : Quantitative type of information
QL : Qualitative type of information
QL-QN : Qualitative-Quantitative type of information

Computation of Disclosure Score

The disclosure score for each entity is calculated by totalling the scores on the 13 items. Thus, entity with full disclosure level will have a total score of 52. The disclosure score for each entity is defined as SCORE in Table 4.2 for statistical test purpose. The full disclosure score is 52.

Table 4.2

Computation of Disclosure Score

SCORE = Individual entity disclosure score
= Sum of the scores of the 13 items

Full Disclosure Score = Sum of the highest score of the 13 items
= 52

4.4.2 Types of Entities

To test hypothesis 2 in this study, entities are to be classified into two types: general government entities and government business enterprises. The manner in which entities are classified may affect the result of the test as rules for such classification may involve judgement. Nobes (1984), in classifying accounting systems, discussed the limitation of classification which can also be applied to this study. He concluded that:

> Exactly which criteria should be used to classify and what weights to give them are matters of judgement. (p.31)

and

> The method of classification was clearly subjective, and based on personal knowledge and descriptive literature. These "shortcomings" are difficult to avoid .....useful classification is bound to be subjective. (p.39)

In particular, the Australian Bureau of Statistics (1987, p.16) also discussed such a limitation when classifying the public sector:

> Because the concept of the public sector is not amenable to precise definition the classification of enterprises to the public sector must rely in many cases on the informed judgement of the classifiers.

This study also experiences a similar limitation in classifying the entities into general government entities and government business enterprises. To make it as objective as possible, criterion consistent with the definition and characteristics of the two types of entities is developed to classify the types of entities for this study. The criterion used for the classification was discussed in section 3.2.2 earlier. This is based on their source of finance. If more than 50 percent of the operating costs are recovered from gross trading receipts, that entity will be classified as government business enterprise. To check with this criterion, those revenue items which come from sales of goods and services to the public are totalled, and is then compared to the operating costs. If such revenue total is more than 50 percent of the operating costs, that entity is classified as government business enterprise. This can be put into a formula form as follow:

50% of total operating costs < total of revenue items from sales of goods and services to the public

If this is true, then the entity is classified as a government business enterprise.

Such classification is also verified by checking against a list of general government sector agencies and public trading enterprises, published in the New South Wales Government Finance Statistics Estimates 1993-94 (NSW Parliament, 1993, pp.36-40). It is found that the result of classification by using the above formula is consistent with this list. But some entities are not found in this list. Since the list is incomplete, it is not used as the basis of classification for this study, but is used to support the classification conducted in this study.

4.4.3 Types of Infrastructure

Hypothesis 3 requires classification of entities by the types of infrastructure provided. Classification into different types of infrastructure is based on the nature of the operation of the entity. There is no difficulty in the classification since it is quite obvious that the entity is operating in providing either transport, water or electricity facilities. Entities which are not providing these three types of infrastructure facilities are classified as others, for example, racing ground, sport centre, housing etc.

4.4.4 User Groups' Interests

In section 4.4.1, the dependent variable, SCORE, was defined. This is the disclosure score of each entity measured by totalling the scores of the 13 items of infrastructure information. In this section, the independent variables used to test the relationship between the disclosure level of infrastructure and the interests of the three groups of users are discussed. Surrogates are chosen to represent the interests of users. This is outlined in Table 4.3.

The reasons for selecting these surrogates and measurements were discussed in sections 3.3.1, 3.3.2 and 3.3.3 earlier. The expected signs of these variables, TLTR, TETR and TOTREV, are shown in Table 4.4. They are all positive given that the objective of general purpose financial reporting is to provide useful information to users. Entities are expected to serve the interests of all three groups of users. This is in line with hypotheses 4, 5 and 6 as discussed in Chapter 3.

Table 4.3

Surrogates for User Groups' Interests

Factor	Surrogate	Measurement	Symbol
Resource Providers' Interests	Debts Level	Total Liabilities/Total Revenue	TLTR
Recipients of Goods and Services' Interests	Operating Results (Operating Deficit)	Total Expenditure/Total Revenue	TETR
Parties Performing an Oversight Function's Interests	Size of Entity	Total Revenue	TOTREV

Table 4.4

Expected Signs of Independent Variables

Independent Variable		Expected Sign
TLTR	The ratio of total liabilities to total revenue Surrogate for resource providers' interests	+
TETR	The ratio of total expenditure to total revenue Surrogate for recipient of goods and services' interests	+
TOTREV	Total Revenue Surrogate for parties performing an oversight function's interests	+

Data for total liabilities are collected from the balance sheet of the entities. However, one entity's financial reporting (Racecourse Development Committee of NSW) is not on accrual basis, thus no balance sheet is presented. Besides, there is no indication in its annual report that the entity has incurred any liabilities. However, it is not

necessarily appropriate to assume that the entity has not incurred any liabilities. Thus, the variable TLTR for this entity is treated as a missing value and is excluded in the statistical tests. This problem also supports the reason for selecting total revenue rather than total assets as a measurement of entity size.

Data for both total expenditure and total revenue are collected from the income and expenditure statement of the entities. Total revenue includes both operating revenue and government funding. SAC 4 (para. 34) suggests that those government grants and appropriations received by not for profit entities in the public sector with the purpose of providing goods and services to consumers, and not to generate a financial return for the government, should be classified as revenue. Besides, general government entities are required to report government funding as revenue in the operating statement (NSW Treasury, 1991, paras. 7.16, 7.17). Thus, in collecting data for total revenue, both operating revenue and government funding are included. Abnormal items are excluded since inclusion of such items may bias the research results.

4.5 Statistical Tests

The statistical tests used in this study are based on the type of measurement scale used. The disclosure score is measured on a five-point scale which is an interval scale. Other variables are measured on the ratio scale. Since the measurement scale used in this study is at least interval, parametric tests can be used which are the more powerful tests than nonparametric tests. However, one of the assumption of parametric tests is that the observations should be normally distributed (Emory and

Cooper, 1991, p.530). Thus, tests for normality will be needed to check for any violation of normality assumption. The result of the normality tests will be discussed in Chapter 5. The statistical tests for each hypothesis are outlined in the following sections.

4.5.1 Useful Information Disclosure Hypothesis

H1: The public sector entities' annual reports disclose information on infrastructure at full disclosure level.

This hypothesis is to test whether public sector entities disclose information on infrastructure which is considered useful to users so as to satisfy the objective of general purpose financial reporting. This is tested by comparing the disclosure score of the entities to the full disclosure score which is 52. Since the measurement scale is interval, two sample t test will be appropriate.

The hypothesis can be expressed in the general null hypothesis and alternative hypothesis for testing:

Ho : Mean score of all entities = 52

Ha : Mean score of all entities $\neq$ 52

The mean of the entities' disclosure score is compared to 52, the full disclosure score. In classical tests of significance, null hypothesis is a statement that no difference

exists between the parameter and the statistic to which it is compared (Emory and Cooper, 1991, p.521). By inductive reasoning, if the null hypothesis cannot be rejected, it means that there is no statistical significant difference between the mean score of the entities and the full disclosure score.

If the null hypothesis is rejected, it means that the mean disclosure score of the entities is significantly different from the full disclosure score and the alternative hypothesis will be accepted. Thus, it can be concluded that public sector entities do not disclose information on infrastructure at a level which is considered useful to users.

4.5.2 Disclosure and Types of Entities Hypothesis

H2: The annual reports of government business enterprises disclose more information on infrastructure than the annual reports of general government entities.

This hypothesis is tested by comparing the mean disclosure scores of the two types of entities, general government entities and government business enterprises, to determine whether there is a statistical significant difference between the disclosure level of these two types of entities.

Since the measurement scale of the disclosure score is interval, two sample t test will be appropriate. The general form of the null hypothesis and the alternative hypothesis can be expressed as follow:

Ho : $\mu_1 = \mu_2$

Ha : $\mu_1 \neq \mu_2$

Where 1 = General government entities

2 = Government business enterprises

Again, non-rejection of the null hypothesis means that there is no significant difference between the mean scores of the two types of entities. A rejection of the null hypothesis means that there is a significant difference between the mean scores of the two types of entities and thus the level of disclosure on infrastructure by these two types of entities is different.

4.5.3 Disclosure and Types of Infrastructure Hypothesis

H3: There is no difference in the level of disclosure on infrastructure among the public sector entities providing transport facilities, water facilities, electricity facilities and other public infrastructure facilities.

This is tested by comparing the mean disclosure scores of the four types of entities providing transport, water, electricity and other facilities. Since the measurement scale is interval, with four independent samples, one-way analysis of variance (One-way ANOVA) will be appropriate.

The general form of the null hypothesis can be expressed as follow:

Ho : $\mu_1 = \mu_2 = \mu_3 = \mu_4$

Ha : $\mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4$

Where 1 = Entities providing transport facilities

2 = Entities providing water facilities

3 = Entities providing electricity facilities

4 = Entities providing other public infrastructure facilities

This is to test that the mean scores of the four samples are equal. In an ANOVA model, the variations can be broken down into between-group variance and within-group variance. If the between-group variance exceeds the within-group variance, it implies that the means among different groups are not statistical significantly equal and the null hypothesis will be rejected. Referring to this study, if the null hypothesis is rejected, it means that the level of disclosure on infrastructure among entities providing different types of infrastructure facilities is different. The use of ANOVA model need to satisfy the normality and equal variance assumptions, and it is reasonably robust, minor variations from normality and equal variance are tolerable (Emory and Cooper, 1991, p.547). This suggests that this is an appropriate test for this hypothesis.

4.5.4 Disclosure and Interests of User Groups Hypotheses

H4: Entities with higher level of debt disclose more information on infrastructure than entities with lower level of debt.

H5: Entities with higher level of operating deficit disclose more information on infrastructure than entities with lower level of operating deficit.

H6: Larger entities disclose more information on infrastructure than smaller entities.

These hypotheses can be expressed as:

Level of disclosure = f(debt level, operating result, size); or

SCORE = f(TLTR, TETR, TOTREV)

This is to test whether there is a relationship between the disclosure level (dependent variable) and the interests of the three groups of users (independent variables), that is, resource providers, recipients of goods and services, and parties performing an oversight function.

The relationship between the level of disclosure on infrastructure and the interests of different user groups is tested by correlation coefficients and multiple regression. For correlation coefficients, both the Pearson product moment correlation coefficients and the Spearman rank-difference correlation coefficients will be used. The latter can be used if the assumption of normality is not met.

Multivariate analysis will also be carried out. Since the dependent variable is at interval measurement scale and independent variables are at ratio scale, multiple regression will be appropriate. Multiple regression is a useful analytical tool in the sense that it helps to predict and explain relationship among a number of variables. Emory and Cooper (1991, pp.630-631) stated that:

> Multiple regression .....is used often to develop a self-weighting estimating equation by which to predict values for a criterion variable (DV) from the values for several predictor variables (IVs).....to control for confounding variables in order to evaluate better the contribution of other variables.....to test and explain causal theories.

Cohen and Cohen (1983, p.7) stated that multiple regression takes "multiplicity of influence" into consideration, thus it is "far more efficient than the strategy of studying multiple factor one at a time". This suggests that multiple regression is a powerful and appropriate tool for analysis when the effect of several factors is to be considered. The general form of the regression equation used in this study can be expressed as:

$$SCORE = b_0 + b_1TLTR + b_2TETR + b_3TOTREV + e$$

Where b_0 = a constant, the value of SCORE when all independent variables values are zero.

b_1 = regression coefficient associated with total liabilities/total revenue.

b_2 = regression coefficient associated with total expenditure/total revenue.

b_3 = regression coefficient associated with total revenue.

e = a random error term, independent and normally distributed.

Thus, this regression equation shows the relationship between the dependent variable, SCORE, and the three independent variables, TLTR, TETR and TOTREV. Each of these independent variables will be tested for their statistical significance.

4.6 Conclusion

This chapter consists of four main parts. In the first part, the research population is defined and the procedures to select the research sample are described. 37 public sector entities which provide the four types of infrastructure as defined in this study are selected. In the second part, data collection procedures are described. Data is collected from the most recent annual reports of these 37 entities. In the third part, the variables used in the hypothesis testing are discussed. Finally, the statistical tests for each hypothesis are described and explained. The results of the statistical tests will be presented and analyzed in the next chapter.