

Public facilities



5.5

TABLE OF CONTENTS

| | |
|--|----|
| THE ROLE AND FUNCTION OF PUBLIC FACILITIES | 1 |
| TYPES OF PUBLIC FACILITY | 1 |
| Functional categories of public facilities | 1 |
| Relationships between public facilities. | 3 |
| QUALITATIVE GUIDELINES | 6 |
| The principle of reinforcement. | 6 |
| The principle of continuity | 6 |
| The principle of discontinuity. | 6 |
| The principle of externalisation | 6 |
| The principle of hierarchical concentration along major routes | 7 |
| The principle of hierarchical association of public space and public facilities. | 7 |
| PROCEDURAL GUIDELINES | 7 |
| Determine the nature of the residential settlement | 7 |
| Prepare an inventory of existing public facilities | 8 |
| Prepare a profile of the target population | 8 |
| QUANTITATIVE GUIDELINES | 8 |
| BIBLIOGRAPHY | 18 |

LIST OF TABLES

| | | |
|-------------|---|-----|
| Table 5.5.1 | Functional categories of public facilities | .2 |
| Table 5.5.2 | Compatibility matrix | .4 |
| Table 5.5.3 | Quantitative guidelines - Educational facilities | .9 |
| Table 5.5.4 | Quantitative guidelines - Health facilities | .12 |
| Table 5.5.5 | Quantitative guidelines - Recreational facilities | .14 |
| Table 5.5.6 | Quantitative guidelines - Cultural facilities | .14 |
| Table 5.5.7 | Quantitative guidelines - Administrative facilities | .16 |

LIST OF FIGURES

| | | |
|--------------|---|----|
| Figure 5.5.1 | Relationships between public facilities | .3 |
| Figure 5.5.2 | Educational facility cluster | .5 |

THE ROLE AND FUNCTION OF PUBLIC FACILITIES

This sub-chapter gives guidance on the planning of public facilities within residential settlements. Public facilities are defined as those basic services which cannot be supplied directly to the individual dwelling unit and as a result are utilised away from the individual residential dwelling unit within the public environment. Public facilities satisfy specific individual or community needs - including safety and security, communication, recreation, sport, education, health, public administration, religious, cultural and social.

Public facilities, as the name implies, are generally regarded as the responsibility of government, whether central, regional or local, and more often than not are provided by government institutions. However, public facilities are also provided privately, when the government-provided services are perceived to be inadequate.

TYPES OF PUBLIC FACILITY

Public facilities can be classed as higher-order, middle-order, lower-order and mobile, depending on the size of the area that they serve.

- **Higher-order public facilities:**
These facilities generally serve the entire region, metropolitan area or city (e.g. hospitals, universities) and are not provided for in the layout planning process for single residential settlements. The location of these public facilities is determined by analysing the most suitable and accessible location for the greatest number of people. Essentially, these facilities are planned in terms of an overall development framework.
- **Middle-order public facilities:**
These are facilities which serve a number of diverse and different communities (e.g. high schools, clinics). These facilities are essential to individual residential settlements, but the facilities serve a threshold population which exceeds an individual settlement, and therefore are supported by a number of settlements.
- **Lower-order public facilities:**
These are facilities which are utilised by a single or a limited number of residential communities (e.g. a crèche or pre-primary school) and which are generally provided for in the design and layout of residential settlements.
- **Mobile public facilities:**
These are facilities which move from one location to another, serving a large number of communities. Many problems with regard to the spatial location of public facilities are increasingly being solved

(especially in less mobile communities) through the use of mobile public facilities - such as clinics, post offices and public telephones. Through mobile facilities the ideal of allocating scarce resources, whilst at the same time serving the greatest number of people, can be achieved.

Functional categories of public facilities

Public facilities can also be defined in terms of the function that they serve (i.e. education, health, recreation, culture and administration). Table 5.5.1 illustrates the hierarchical categories and also indicates whether the facilities are publicly or privately provided, and the order of the facility.

Table 5.5.1: Functional categories of public facilities

| FUNCTIONAL CATEGORY OF PUBLIC FACILITY | NATURE OF FACILITY | PROVISION: PUBLIC OR PRIVATE |
|---|--------------------|--|
| Educational facilities | | |
| Crèche/nursery school | Local/middle order | Generally privately provided |
| Primary school | Local/middle order | Generally public provided, but may be private |
| Secondary school | Middle order | Generally public provided, but may be private |
| Tertiary facilities (colleges, technikons and universities) | Higher order | Generally publicly provided |
| Adult learning centres | Middle order | Generally public provided, but may be communal |
| Health facilities | | |
| Mobile clinics | Mobile | Publicly provided |
| Clinics | Middle order | Publicly and privately provided |
| Hospitals | Higher order | Publicly and privately provided |
| Recreational facilities | | |
| Playgrounds | Lower/middle order | Publicly provided |
| Sports fields | Middle order | Publicly provided |
| Sports clubs | Middle order | Usually privately provided |
| Sports stadiums | Higher order | Publicly provided |
| Cultural facilities | | |
| Libraries | Middle order | Publicly provided |
| Community centres | Lower/middle order | Publicly provided |
| Religious centres (churches, synagogues, mosques, etc.) | Lower/middle order | Privately provided |
| Administrative facilities | | |
| Cemeteries | Middle order | Publicly provided |
| Magistrate's court | Higher order | Publicly provided |

| Table 5.5.1: Functional categories of public facilities (continued) | | |
|---|---------------------|------------------------------|
| FUNCTIONAL CATEGORY OF PUBLIC FACILITY | NATURE OF FACILITY | PROVISION: PUBLIC OR PRIVATE |
| Administrative facilities (continued) | | |
| Municipal offices/pay points | Middle order | Publicly provided |
| Post offices | Middle order | Publicly provided |
| Police stations | Middle order | Publicly provided |
| Fire stations | Middle/higher order | Publicly provided |
| Old age homes | Middle order | Publicly provided |
| Children's home | Higher order | Publicly provided |
| Information centres | Middle order | Publicly provided |

Relationships between public facilities

Table 5.5.2 is a compatibility matrix which attempts to identify the degree of compatibility between various public facilities when related to one another. The degrees of compatibility are defined below.

- **Compatible:** There are interrelationships or linkages between the facilities and they can be located close to, or clustered with, one another.
- **Neutral:** There are no obvious linkages or interrelationships between facilities; their location together would have no benefits or disadvantages.
- **Incompatible:** The facilities are unsuitable to be located in close proximity or adjoining one another as their uses are contradictory.

Complex and intricate patterns and relationships exist between various public facilities. An example of relationships and interrelationships between various public facilities is given in Figure 5.5.1.

The relationships depicted in the example refer to

- individual facilities (e.g. individual school buildings with their own individual playing or exercise areas); and
- shared facilities, including
 - specialised facilities (e.g. main hall, main library), and
 - sport facilities (e.g. swimming pools, tennis courts).

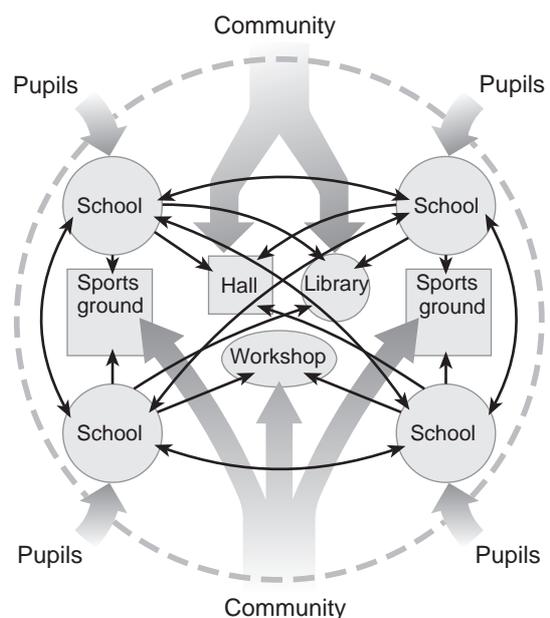


Figure 5.5.1: Relationships between public facilities (Smit and Hennessy 1995)

The shared facilities will not exclusively serve the schools but also be accessible to the public.

It is these interrelationships that present the opportunity for the clustering of facilities. Essentially there are two types of facility cluster:

Table 5.5.2: Compatibility matrix

| FACILITIES | Educational facilities | Creche/Nursery school | Primary school | Secondary school | Tertiary facilities | Adult learning centres | Health facilities | Mobile clinics | Clinics | Hospitals | Recreation facilities | Playgrounds | Sports fields | Sports clubs | Sports stadiums | Cultural facilities | Libraries | Community centres | Religious centres | Cemeteries | Administrative facilities | Magistrates court | Municipal offices | Post offices | Police stations | Fire stations | Old age home | Children's home | Information centres | |
|---------------------------|------------------------|-----------------------|----------------|------------------|---------------------|------------------------|-------------------|----------------|---------|-----------|-----------------------|-------------|---------------|--------------|-----------------|---------------------|-----------|-------------------|-------------------|------------|---------------------------|-------------------|-------------------|--------------|-----------------|---------------|--------------|-----------------|---------------------|---|
| Educational facilities | ● | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Creche/Nursery school | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Primary school | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Secondary school | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tertiary facilities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Adult learning centres | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Health facilities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mobile clinics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Clinics | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Hospitals | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Recreation facilities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Playgrounds | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sports fields | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sports fields | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sports stadiums | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cultural facilities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Libraries | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Community centres | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Religious centres | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cemeteries | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Administrative facilities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Magistrate court | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Municipal offices | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Post offices | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Police stations | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Fire stations | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Old age home | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Children's home | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Information centres | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Key:
 ● Compatible
 ○ Neutral
 ⊕ Incompatible

Multipurpose facility clusters

A multipurpose facility cluster is a multifaceted facility under one roof or more, which offers a range of services such as social services, recreation, health, economic activity, in one location. Multipurpose facility clusters are generally located together with one or the other structural elements of urban settlements (at a transport stop/interchange, urban square, market, sports field, etc).

The multipurpose facility cluster concept provides for a flexible grouping of facilities at an accessible location. Each cluster is essentially a social hub and the size and number of services provided will depend on the demand and needs of surrounding living environments.

Multipurpose facility clusters can range from metropolitan development nodes to local clusters of telephones, bus stops and post boxes.

The specific composition of a single facility cluster is dependent upon:

- its location relative to the transport network;
- its location within the metropolitan area;
- the size of the community/(ies) from which it draws support;
- community-identified needs; and
- the size of service area for facilities.

The advantages of establishing multipurpose facility clusters are outlined below:

- convenience, as all services are located in one centre and people can accomplish a number of tasks within a single journey, which equates to savings in terms of money, time and effort and has the net effect of improving quality of life;
- a reduction in the cost of providing public facilities through the sharing of resources, equipment and land;
- exposure for public facilities and encouragement

of their use;

- integration of different communities;
- a reduction of inequalities in the provision of facilities;
- the provision of greater security; and
- the offsetting of transport costs.

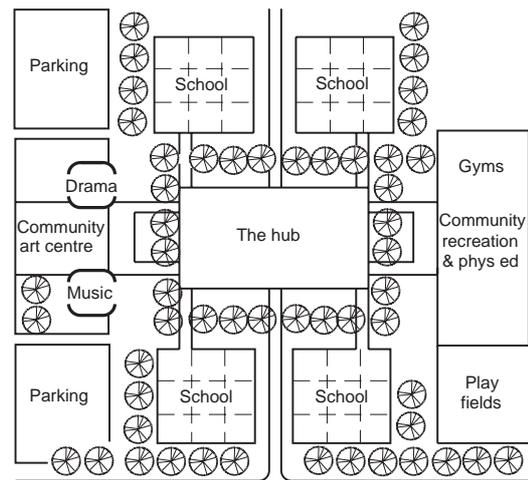
Functional clusters

Another concept which is becoming increasingly popular in terms of public facility provision is the creation of functional clusters of facilities. The concept applies to all functional categories of public facilities; however, most research has focused on educational and related facilities. As a result, the proposals detailed below refer specifically to education. They could, however, be applied to other functional categories of public facilities.

Current thinking proposes to externalise the provision of educational facilities from within local areas and cluster them together around a hub of shared specialised facilities. In terms of this concept a number of educational buildings are loosely clustered together with residential and commercial facilities, around a hub of specialised facilities. The hub is easily accessible in terms of public transport. The specialised hub is a communal facility that can be used by the entire community. The school playgrounds and fields are shared among the schools and are also available for use by the community after hours and on weekends.

Individual schools within the education cluster can be enclosed separately if so desired, but the shared facilities should be easily accessible to the public and should be integrated into the built environment. These shared facilities need not be physically attached to individual schools but should always be easily accessible - not more than a few minutes' walk.

The functional cluster concept is illustrated in Figure 5.5.2.



*Figure 5.5.2: Educational facility cluster
(after Leggett et al 1977)*

The advantages of clustering functional facilities are summarised as follows:

- convenience, as all services are located in one centre;
- the sharing of high-cost elements can reduce costs considerably (e.g. specialised facilities like laboratories and space-extensive facilities like libraries) ;
- exposure for public facilities and the encouragement of their use;
- the integration of different communities;
- a reduction in inequalities in the provision of facilities;
- the offsetting of transport costs;
- a cutting down on the amount of land required;
- the promotion of full use of buildings;
- lower building costs;
- lower running costs;
- minimum maintenance costs;
- a large catchment area, less susceptible to localised demographic changes.

QUALITATIVE GUIDELINES

This section involves an elaboration of the principles of reinforcement, continuity, discontinuity, externalisation, concentration and hierarchical association, as outlined in Chapter 3. These principles form the basis of urban structuring and have vast implications for the organisation of public facilities.

The principle of reinforcement

- Public facilities should be located adjacent to public spaces. The net effect of the association of these two structural elements is that the urban form is strengthened and defined creating a logical pattern within the urban settlement which is easily recognised by its inhabitants. As a general rule the most important and largest of public facilities should be associated with the largest and most important open spaces.
- Public facilities can be used to define hard open public spaces and create a sense of definition and enclosure, as well as to improve the security of the public open space by providing surveillance from the public-facility buildings.
- Higher- and middle-order public facilities should be located in dominant positions relative to open space and movement systems - especially those that cater for public transport. This has the effect of strengthening their importance and significance for the community as they become symbolic focal points within settlements. This can be achieved by aligning roads to key public facilities (i.e. community centres and religious facilities) to create vistas and enable the associated informal activities to spill out into the adjoining open spaces.
- Through the reinforcement of these structural elements, convenience, choice and efficiency in resource use are achieved.
- The clustering of a number of public facilities together can lead to intensive utilisation by a large number of people, and, through the creation of “load centres” can generate the largest demand for utility services. Clusters of public facilities can therefore be used to “pull” service mains economically through a settlement, with the facilities - and the public spaces they abut - accommodating a range of services often not supplied to single residential erven.

The principle of continuity

- Soft open spaces should be linked together throughout settlement systems in order to form a continuous web of recreation space leading through the built environment. Public facilities can be clustered adjacent to these open spaces, which can

then be accessed by defined pedestrian paths leading through the open space system. In addition, the open space can serve a dual purpose in that it can provide recreational playgrounds and sportsfields for clusters of schools and the community.

- A diverse and continuous network of multifunctional open and flexible movement routes should weave through settlement systems and connect public facilities. The placement of public facilities at regular and convenient intervals along these routes will ensure that they are easily accessible by all modes of movement.
- Those public facilities which serve numerous communities or the region as a whole will need to be located along major transport routes, which form part of the public transport systems and which are punctuated by public transport stops at frequent intervals. This will ensure that public facilities are easily accessible to all sectors of the population. The location of public facilities along these routes will provide exposure of the facilities to the greatest number of people, thereby encouraging their use.

The principle of discontinuity

- Higher-order and middle-order public facilities should be located on stop-start activity streets, in order to create thresholds high enough to support facilities and also ensure that the people can gain direct and easy access to facilities.
- Public spaces (public facilities and open spaces) can be used as mechanisms to create areas of intense activity and tranquil settings, thereby creating a range of spaces from very public through to very private. These provide for variation within the urban fabric and add interest and diversity to settlements.

The principle of externalisation

- Public facilities should be placed in positions of maximum exposure along major transportation routes. The exposure of these facilities enables complex patterns of facility use between different neighbourhoods and serves to integrate rather than isolate residential neighbourhoods.
- The clustering and sharing of facilities is not only more efficient but can also have a positive impact on development and result in increasing private investment, as it creates potential sites for local business and generates more concentrated activity and travel patterns.
- Public facilities that are functionally related can be located in clusters outside predominantly residential areas, to allow for resource-sharing and

the multifunctional use of buildings and space, thereby creating efficiency in layout plans by reducing the amount of space required for the facilities - reducing costs and reducing the number of trips required to access certain public facilities.

- If facility provision is integrated with public transport, and several facilities are located together in one place which is easily reached by car or foot, this will:
 - provide convenience as the number of trips is reduced;
 - save resources as different services can share space;
 - transmit signals for future investment;
 - provide advantages in terms of the efficient provision and operation of public transport; and
 - provide advantages for utility-services reticulation.

The principle of hierarchical concentration along major routes

Public facilities serve different purposes and therefore the location of a public facility will depend on the specific function that it performs. One needs to evaluate what purpose and function the facility will serve and then decide on the best location. Behrens and Watson (1996) define the following five categories of public facility on the basis of locational requirement:

- Public facilities that distribute emergency vehicles (ambulances, fire engines, etc) should be located on higher-order multifunctional routes that intersect with regional or primary distributors.
- Public facilities that need to be visible and accessible to the greatest number of people require easy access to public transport stops and interchanges and high levels of exposure to more intense activity routes (i.e. libraries, community centres, post offices etc).
- Public facilities that need to be visible and accessible to the greatest number of people, but located in a safe, quiet environment require easy access to public transportation stops and interchanges, but should be located a block or two back from intense activity routes (i.e. primary and secondary schools, day-hospitals and clinics).
- Public facilities that need to be accessible to pedestrians and that need safe and quiet surroundings should be located within the residential area within walking distance of the

residents homes (i.e. crèches and churches).

- Public facilities that need to be as visible and as accessible to pedestrians as possible should be located within walking distance of the user household on busier road intersections.

The principle of hierarchical association of public space and public facilities

- The main focusing elements of integrated land-use environments are public facilities, as they are the collective communal gathering places for the surrounding population.
- Public facilities that are provided for in settlements can be divided into two categories - those that serve a single group or community (homogeneous facilities) and those that serve multiple communities (heterogeneous facilities):
 - Homogeneous facilities are very local in nature and are generally found within residential settlements and serve a particular community (i.e. a church or crèche);
 - Heterogeneous facilities, on the other hand, serve a variety of different groups and are more public in nature. These tend to be found in locations that are accessible to the greatest number of people. The location of these public facilities should be closely linked to the transport system (especially public transport).
- The clustering of public facilities will result in the formation of facility clusters, ranging from metropolitan development nodes to local clusters. The hierarchy of such centres is closely linked to their location and accessibility, with the higher-order centres being located at points of maximum accessibility (i.e. intersection of major transport routes).

PROCEDURAL GUIDELINES

When planning for public facilities for residential settlements it is necessary to analyse the site and target population in order to determine the type of public facilities required for a specific development.

The following procedures should be undertaken in order to determine what facilities are required.

Determine the nature of the residential settlement

Before any planning is done, one needs to determine what type of development is being planned and in this regard it is important to distinguish between “greenfield” sites and “infill” sites.

- Greenfield sites are large vacant tracts of land and usually involve the provision of a large number of new housing units; as a result these sites will require a number of new public facilities to serve the needs of the future residents.
- Infill sites generally involve filling up the vacant land in and around existing settlements; in these cases there are usually facilities in close proximity and the development tends to be small in nature.

Therefore the planning of public facilities for different forms of settlement will vary.

Prepare an inventory of existing public facilities

In order to determine what facilities are required by the target community, one needs to evaluate what facilities exist in the surrounding areas, whether these facilities are operating at full capacity, and whether they will be adequate to serve the needs of the proposed new living environment.

One will need to create a public facilities plan showing the existing and proposed public facilities in the area. This will give an indication of what is available and what is over- and underutilised, by providing an indication of what is required within the new living environment.

The creation of an inventory applies not only to the lower and middle-order facilities, but also to the higher-order and mobile facilities as, if they provide a good service and are easily accessible (especially by public transportation), these will be utilised by communities.

Prepare a profile of the target population

It is necessary to have a complete profile of the population for which the public facilities are intended, in order to determine what facilities that community requires. An incomplete population profile can result in facilities which are inappropriate (i.e. the provision of a crèche in an area where the population is ageing).

One needs to determine the following:

- Age and gender profile (gender ratios, household age structure and size).
One needs to determine what age group and gender one will be serving, in order to determine what types of facility will be required (i.e. an ageing population will require access to health facilities, as opposed to educational facilities).
- Income profile (household expenditure and income).
The income and various areas of income

expenditure of the target group for which the public facility is intended need to be determined in order to establish whether the community can afford the public facility and whether it is appropriate.

- The level of public facility provided.
This needs to accord with what the community can afford and must be prioritised by the community itself, in order to ensure that limited financial resources are converted into services that are required and which will be well utilised by the community.
- Cultural profile.
The mix of population in a given area is likely to determine what public facilities are required. The social structure will ultimately shape the demand for public facilities, eliminating the need for some, and placing greater emphasis on the need for others.
- Discuss community priorities.
In some instances the target community has already been identified and their needs and wants in terms of public facilities can be determined through public participation and survey. This will give a clear idea of what a particular community requires in terms of public facilities. Where a target community does not exist, one can analyse similar surrounding communities in order to determine what types of public facilities are needed.

QUANTITATIVE GUIDELINES

In the past, public facilities were provided through the application of a set of standards relating to the provision of different types of public facility. These tended to be rigid and inflexible and, as a result, it was decided instead to provide a set of guidelines for the provision of public facilities (see Table 5.5.3 - 5.5.7). As the name implies, these are meant to guide the planning of public facilities and cannot be applied uniformly across the board. The context must be evaluated and the guidelines adapted to suit the specific situation at hand.

International comparisons indicate that public facilities and amenities should together generally take up between 15% and 25% of land in a development (Behrens and Watson 1996). Of this combined amount, \pm 33% should be taken up by public facilities, and \pm 66% taken up by public open spaces. An ideal breakdown of private (i.e. housing, commerce and industry), and semi-public (i.e. roadways and footways) use of land is in the region of 50-60% private, 15-25% semi-public and 15-20% public. The following tables provide guidelines in respect of location, access, size and dimensions and thresholds.

Table 5.5.3: Quantitative guidelines - Educational facilities

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|-----------------------|---|---|--|---|
| Crèche/nursery school | <p>These are community-specific facilities which should be within walking distance of residential units.</p> <p>Facilities can be clustered with pre-primary schools, primary schools, community centres, etc. (This does, however, result in the externalisation of facilities beyond individual residential settlements).</p> | <p>Should be accessible by pedestrian pathways without having to cross major streets. Where streets are crossed these should be minor streets.</p> <p>Maximum travel time: 10 minutes (whether by foot or vehicle).</p> <p>A maximum walking distance of 750 m.</p> | <p>Minimum size for facility: 130 m²</p> <ul style="list-style-type: none"> • 50 m² per 45 children served. • Minimum area per playlot: 20 - 30 m². • One third of the total area should be used for circulation, administrative and ancillary uses. | <p>Estimated minimum population: 5 000.</p> |

Table 5.5.3: Quantitative guidelines - Educational facilities (continued)

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|----------------|--|---|--|---|
| Primary school | <p>Should be located within easy reach of the local areas which it is intended to serve. As a result it needs to be located close to, but not necessarily along, a public transport route.</p> <p>Primary schools can be combined with a number of other facilities to form a cluster (i.e. a high school, community hall, playground, park, etc).</p> | <p>Should ideally be accessible by foot, bicycle and vehicle.</p> <p>Maximum travel time: 20 minutes (whether by foot, bicycle or by vehicle).</p> <p>Maximum walking distance: 1,5 km.</p> | <p>Buildings and recreational space are the two components of a school which physically occupy the site.</p> <p>The minimum size of a primary school site is estimated at 2,4 ha and is made up as follows:</p> <p>Buildings: 1,4 ha Recreational space: 1 ha.</p> <p>If exact numbers are known, one can do a calculation based on the following:</p> <ul style="list-style-type: none"> • 40 pupils per classroom and 50 m² per classroom. • One third of the area for circulation, administrative and ancillary uses. • Recreational area: 1 ha (playing fields). | <p>Estimated minimum population: 3 000 - 4 000.</p> |

Table 5.5.3: Quantitative guidelines - Educational facilities (continued)

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|---------------------|---|--|---|---|
| High school | School should be situated on a major transport route with public transport stops. | <p>Maximum travel time: 30 minutes.</p> <p>Maximum walking distance: 2,25 km.</p> | <p>The minimum size of a high school is estimated at 4,6 ha and is made up as follows:</p> <p>Buildings: 2,6 ha Recreational space: 2 ha.</p> <p>If exact numbers are known then one can do a calculation based on the following:</p> <ul style="list-style-type: none"> • 40 pupils per classroom and 50 m² per classroom. • One third of the area for circulation, administrative and ancillary uses. • The recreational area can be calculated according to the type of sports to be offered - refer Sub-chapter 5.5, Table 5.4.3, for the dimensions of sportsfields. | Estimated minimum population: 6 000 - 10 000. |
| Tertiary facilities | Regional facilities located along major transport routes with public transport stops. | Regional scale of facility means that it would be planned for in terms of a development framework and not when designing specific living environments. | | |

Table 5.5.3: Quantitative guidelines - Educational facilities (continued)

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|------------------------|---|--------|---------------------|-------------------------------|
| Adult learning centres | Adult learning centres are not usually provided as stand-alone facilities and generally “double up” with some other form of facility (i.e. a community centre, hall, school etc). No figures have therefore been given as the most efficient provision is through doubling up where existing space is adapted for adult learning classes. | | | |

Table 5.5.4: Quantitative guidelines - Health facilities

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|---------------|--|--|--|--|
| Mobile clinic | Mobile facilities which move from community to community - therefore there is no fixed location. | Must be accessible by foot. Maximum walking distance: 1 km. | These are self-contained units. Space is, however, required to park and operate the clinic: this can be done from a local park, community centre, church, etc. | A mobile facility will serve a population of about 5 000 people. |

Table 5.5.4: Quantitative guidelines - Health facilities (continued)

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|-----------|--|---|--|---------------------------------------|
| Clinic | <p>Clinics should be accessible to the greatest number of people and as such should be located close to public transport stops.</p> <p>The facility need not be located along a major route and can be located a block or two back, in quieter surroundings.</p> | <p>Maximum walking distance: 2 km. Where it is not possible for the facility to be placed within walking distance, it must be easily reached via public transport, with a maximum walk of 5 minutes from the public transport stop to the facility.</p> <p>Maximum travel time of 30 minutes to reach the facility.</p> | <p>The size of the clinic will vary according to the number of people the clinic will serve - the more people the greater number of services required, and as a result the larger the facility.</p> <p>The following guidelines are suggested:</p> <ul style="list-style-type: none"> • 0,1 ha per 5 000 people • 0,2 ha per 10 000 people • 0,5 ha per 20 000 people • 1 ha per 40 000 people • 1,5 ha per 60 - 80 000 people. | An estimated minimum of 5 000 people. |
| Hospitals | These are regional facilities, which must be located along major transport routes in close proximity to public transport stops. | Regional scale of facility means that they would be planned for in terms of a development framework and not when designing specific living environments. | | |

Table 5.5.5: Quantitative guidelines - Recreational facilities

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|-----------------|---|--|---------------------|-------------------------------|
| Playgrounds | See Sub-chapter 5.4 Table 5.4.3 | | | |
| Sportsfields | | | | |
| Sports clubs | These are generally privately provided and therefore fall beyond the scope of this document. | | | |
| Sports stadiums | Regional facilities, located along major transportation routes in close proximity to public transportation stops. | Regional scale of facility means that they would be planned for in terms of a development framework and not when designing specific living environments. | | |

Table 5.5.6: Quantitative guidelines - Cultural facilities

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|-----------|--|---|---|--|
| Libraries | Should be easily accessible, preferably on main thoroughfare convenient to main traffic and transportation routes. Libraries can be combined with a number of other facilities to form a convenient cluster i.e. schools, community centres, etc. | Libraries should be within walking distance of the communities they are to serve. Walking distance: 1,5 km - 2,25 km. Where it is not possible to provide the facility within walking distance, it should be within 5 minutes walking distance of a public transport stop. Maximum travel time: 20 - 30 minutes. | Libraries require a minimum of two books per capita and the size of the library will depend upon the population being served. The suggested minimum size is 130 m ² . | Libraries can serve populations of 5 000 - 50 000. |

Table 5.5.6: Quantitative guidelines - Cultural facilities (continued)

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|--|--|---|---|--|
| Community centres | A community centre provides a variety of services to a number of residential communities and, as such, it should be easily accessible to these communities, preferably on a main thoroughfare in close proximity to public transport stops. | Where possible, community centres should be within walking distance. The suggested distance is 1,5 km - 2,25 km. Where it is not possible to provide the facility within walking distance it should be within 5 minutes walking distance of a public transport stop. A maximum travel time of 20 - 30 minutes is recommended. | The estimated minimum size is 5 000 m ² . This may vary according to the amount of sharing undertaken with other public facilities such as parks, libraries, playgrounds, and schools. | A minimum population of about 10 000 people. |
| Religious centres (churches, synagogues, mosques, etc) | The location will generally depend on the community being served and the existing facilities in the area surrounding the site. Churches can be clustered with other public facilities such as playgrounds, community centres, halls, etc, in order to promote multifunctionality. | Churches are generally community facilities and should be located within walking distance for members. Maximum walking distance: 1,5 km. The maximum travel time by foot or public transport or vehicle: 20 minutes. | There is no common uniform agreement as to the adequate size of a church site. The size will depend on the facilities provided (i.e. if there is a religious school attached, the site will be much larger). A site can therefore range from 150 m ² - 3 000 m ² . | It is estimated that approximately 2 000 people are required to support a single church. |
| Cemeteries | Cemeteries are generally not considered as a land use which is compatible with residential land use and, as a result, they are not dealt with in this document. | | | |

Table 5.5.7: Quantitative guidelines - Administrative facilities

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|------------------------------|---|--|--|--|
| Magistrates court | This is a provincial facility and courts are planned and provided for by the provincial administration. | | | |
| Municipal offices/pay points | These facilities require high levels of exposure and must be easily accessible by public transport. | Should be accessible by public transport. Maximum travel time: 30 minutes. | The minimum size for municipal offices is 3 000 m ² . | A minimum population of 50 000 people. |
| Post offices | Post offices generally serve a number of communities and, as a result, need to be visible and accessible to the surrounding population. As such, they should be located along activity routes within easy walking distance of public transport stops. | Where possible, communities should be able to access the post office on foot - the maximum walking distance is 2 km. The maximum travel time per foot/vehicle: 30 - 40 minutes. | These have generally moved into commercial shopping nodes and, as such, the rental will be a determining factor when deciding on a minimum size. The minimum recommended size is 500 m ² . | Estimated minimum population: 11 000 people. |
| Police stations | Community police stations should be located central to all the communities which they are required to serve and should be on a main thoroughfare - so that emergency vehicles can be easily dispatched to adjoining communities. | Where possible, people should be able to access their community police station on foot - a walking distance of 1,5 km is recommended. Maximum travel time: 20 minutes. | Varies between 0,1 ha - 1 ha, depending on the type of facility provided. | Estimated minimum population: 25 000. |

Table 5.5.7: Quantitative guidelines - Administrative facilities (continued)

| Facility | Location | Access | Size and dimensions | Use capacities and thresholds |
|-------------------------------|--|---|---|---|
| Fire stations | Fire stations distribute emergency vehicles to the area and as a result, they should be located on higher-order multifunctional routes that intersect with primary or regional distributors. | Fire stations are a higher-order facility - not generally planned for within a residential community nor one that residents would require access to on a regular basis. | Average erf size: 1,2 ha. | Estimated minimum population: 60 000 people. |
| Old age home | Old age homes are generally provided by the private sector, based on need and demand, and are therefore not dealt with in this guideline. | | | |
| Children's home | This is a regional facility and would be provided in terms of a development framework based on statistics regarding homeless children. | Not applicable to the planning of residential settlements. | Average erf size: 2 ha. | One children's home is required per 200 000 people. |
| Community information centres | These are aimed at providing information to communities on the various services and activities available to them. They should be easily accessible, and visible to as many people as possible. They would be located on busier road intersections. | They should be within 1 km walking distance of residents or easily accessible by some means of public transport with a maximum journey time of 15 minutes. | The size of the facility will depend upon funds available but the building need not be bigger than 100 m ² . | Estimated minimum population: 22 000 people. |

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