

The City of Gaborone, Botswana: Planning and Management

In this paper we trace how Gaborone has grown from a very small village to the capital city of Botswana in a period of less than 30 years. Attention has been given to how careful design of master plan concepts has shaped the city and responded to the needs and aspirations of the residents. Through appropriate and enabling urban-development policies, standards and codes, a very amenable environment has been created. The city can boast of adequate and modern civic and commercial centers; modern functional infrastructure including water, electricity, roads and sewage systems; access to land for virtually all people; adequate housing provided by both the public and the private sectors and for the low income, the adoption of a very successful program of squatter upgrading and self-help housing. Through careful management and development control practices, city growth has been contained quite well in spite of rapid development and the future of the city looks quite bright.

INTRODUCTION

Gaborone today is one of the fastest growing capital cities in Africa and perhaps in the Third World. In spite of its rapid growth, through careful planning and management, development of the city has been sustainable in all respects. This paper discusses the urban development policy and system of planning, in order to see how these have influenced the growth and development of the city is done. An examination of the actual physical planning aspects of the city by looking at planning concepts, development standards/codes used, land uses, transport and communication and infrastructure and social services provision. The various strategies and programs introduced to cope with life in the city, housing needs, infrastructure requirements, transportation; unregulated settlements and finally environmental issues and awareness are also presented. In all cases, we examine whether the concepts of planning that have been adopted have been enabling or not and whether or not the City of Gaborone can sustain itself in the future.

Urbanization in Botswana: An Overview

Urbanisation in Botswana is a fairly recent phenomenon. At Independence (1996) only 4% of Botswana's population lived in urban areas and the overwhelming majority was to be found in unplanned settlements. Gaborone was being developed then as the new capital from its former base in Mafikeng, in the Republic of South Africa. Soon afterwards, the new settlement of Selebi Phikwe and Orapa begun to take shape. The creation of new towns has continued, more recently with Jwaneng and Sowa town (1).

With the growth of these towns, the rate of urbanization has moved fast rising from 54 416 people out of a total population of 574 094 in 1971 to 150 021 out of a population of 941 027 in 1981. By 1991, the urban population had grown to 133 486 out of a total population of 1 300 000. The urban population grew then from 9.5% in 1971, to 15.9% in 1981 and to 22.8% in 1991, with mining towns experiencing the highest population growth in the shortest possible time (2).

As in most Third World countries, rapid, urbanization has been caused mainly by rural-urban migration. Most people have moved from the rural areas to urban areas for several reasons including the following: the search for cash employment; the inability of the rural areas to support current populations; the magnet of better facilities in urban areas; and the desire of youths to escape from what are perceived as traditional restraints, discipline and limitations (3). In order to deal with this growth, a system of physical planning has been instituted, but in spite of these efforts success is becoming difficult to achieve due to the speed of urbanization. However, both town planners and the local authorities are struggling to keep the situation under control.

Urban Planning Practice in Botswana

It is necessary to explain that the term "town" in Botswana refers to a legally established town under the *Township Act*. The extent of the town is established by a legal document. These towns are only created in State Land and in the concession areas and not in the Tribal Territories (unless the Town Area is first legally deducted from the *Tribal Land Board Authority*). Thus, the traditional villages however large (and many of them are larger than established towns), are not classified as or described as towns, nor are the legal landownership systems and registration is the same.

Physical planning is the responsibility of the *Ministry of Local Government, Lands and Housing* through its department of *Town and Regional Planning*. Some planning functions have been delegated to local authorities and physical planners have been posted to the local authorities to undertake the planning and development control functions at the local level. The day-to-day management of built environments on the other hand is the responsibility of the local authorities/urban councils.

The Ministry of Local Government, Lands and Housing is the principal land manager. The Ministry is responsible for setting guidelines and policies on the use of land. The Department of Town and Regional Planning is responsible for the preparation of physical development plans and setting detailed guidelines for development control. *The Department of Surveys and Mapping* is responsible for surveying. *The Department of Lands* is responsible for land allocation and land administration. Local authorities have delegated powers for controlling development within the areas of their jurisdiction.

NATIONAL URBAN DEVELOPMENT POLICY

In order to understand how the City of Gaborone has been planned and continues to be developed, we must examine the overall national urban development policies which impinge on its planning. Several urban development policies have been evolved over the years to guide the growth and development of urban areas in general.

The Policy of Nonsubsidy

This policy seeks to ensure that the government's approach to urban development, in terms of infrastructure standards, service provision, allocation of resources, etc. is consistent with national objectives of promoting rural development and discouraging urban migration (4). A fundamental plank of this policy



Central Square at the Mall, Gaborone. The President Hotel in the background. Photo: A. González.

is that urban areas should not be subsidized by government. While investment is required in urban infrastructure, all provision should be made on a cost recovery basis, while any subsidy from tax revenue should be directed towards the rural areas. The Government aims to achieve full cost recovery, or as close to this as possible, from the beneficiaries of its urban land servicing activities. In view of affordability limitations among lower income households, the pricing policy incorporates an element of cross subsidy from wealthier households and commercial and industrial developers to low income households. The pricing policy is now being implemented in urban development in the form of a three-tier pricing structure of "market", "full cost recovery" and "affordable" prices, which incorporates:

- purchasers of industrial and commercial plots and second time purchasers of residential plots pay "market" prices, which are estimated or negotiated by government if necessary;
- first time purchasers of residential plots in the high income and upper-middle income housing categories pay "full cost recovery" prices;
- first time purchasers of low income and lower middle income plots pay "affordable" prices, based on the income levels of the 70% of urban households at the lower end of the income distribution;
- the inclusion of full costs in cost-recovery prices, including land acquisition, financing and administrative costs;
- the review of income ranges for the allocation of plots to ensure fair and equitable allocation and the clear targeting of subsidies at low income households; and
- the establishment of a "second lien" over plots which are provided on a subsidized basis, to ensure that if such plots are sold within ten years of allocation the subsidy element will be recovered by Government. This is intended to discourage fronting and speculation in land by owners who have benefited from subsidies.

Two policy objectives can be drawn from this: (i) town councils should normally be able to finance all their expenditure from their own revenues; and (ii) Self-Help-Housing schemes meant to help low-income earners to get access to housing should seek to recover all costs from the beneficiaries. In pursuit of the latter objective, the government has, over the years, brought pressure to bear on town councils to introduce an economic service levy.

The general approach adopted by the Botswana Government would appear to be a very good one. Many of the problems of uneven development in other Third World countries stem from an "urban bias" in the provision of services and of government subsidies. Botswana seems to be one of the relatively few countries which has made significant efforts to redirect resources towards rural development.

Policy on Housing and Land Servicing

Housing: The government has gone all out to provide decent housing for all groups of people in urban areas. Mass housing

is built by the Botswana Housing Corporation both for rental and for sale. For the low income groups, the government introduced a Self-Help-Housing Program (SHHA), since the 1970s, to provide site and service plots where people can erect their own houses at their own pace using standards which have been watered down to ease affordability. In addition, the policy towards squatter areas has been that of upgrading and provision of facilities, rather than demolition. Recently, there has been a slight change of policy with government being the facilitator of housing rather than the sole provider. The private sector, financial institutions and individuals are now being called upon to service land and to engage in construction of housing in urban areas.

Land Servicing: As in most countries, the availability of serviced land in the urban areas of Botswana to house the increasing migrant population has always been a problem. The government has responded to the problem of land availability and servicing by launching two programs: The Accelerated Land Servicing Programme (ALSP) in 1987/88; and the sale of state land to the public for building purposes. Under the ALSP, 4943 plots, for both residential and industrial use, were to be available by the end of 1990. The number was expected to rise to 19 467 at the end of 1994. In total, an estimated P 200 million (1 USD = 2.5 Pula) is required to effect the program (5).

Under the sale of plots program, each resident is entitled to two plots for each land use in any of the urban areas in the Republic. Residential plots cost P 3343 for a low income plot of 375 m². The price goes up to P 37 869 for large high income plots of 920 m². Theoretically, financing will mainly be available from financial institutions. Both programs have been slightly delayed. However, a lot of residential and other plots have come on stream. This has eased the problems of shortage of land in Gaborone in particular.

The Policy of Social Mix

Another aspect of the urban development policy is that of "social integration".

The intention of this policy is that urban areas should be planned in such a way as to avoid polarization of social classes, races, and income groups. This would help to avoid the development of low income "ghettoes". In the planning of a new district, provision should be made for all income groups. The policy does not seem to be very precise as to how this should be done. It does not appear to mean complete integration of different income groups in the same street, but rather that any neighborhood should contain a mixture of plots/houses for different income groups.

The objectives which underlie this policy seem wholly laudable. However, the idea of "social mix" is one which has been questioned as a planning philosophy in developed countries. There may be a risk that close juxtaposition of different income groups could generate rather than prevent friction. However, there is no easy answer to this problem. However, some flexibility in application of the social mix policy, as well as improved planning of residential areas, may be called necessary.

Development standards

The Government of Botswana has already gone a long way towards the adoption of appropriate development standards; it has abandoned any idea of demolishing squatter settlements in favor of upgrading; it has sought to make SHHA schemes affordable by the poor; and building regulations have been adapted to a realistic level (18). Even specific building regulations for the low income (Grade II- Residential Houses Standards) have been articulated to facilitate easy construction by this income group. It is with this general background that the planning and develop-

ment of the city of Gaborone and its environs should be discussed.

THE PLANNING AND DEVELOPMENT OF GABORONE

History

Twenty-seven years ago, Gaborone was a small village of 6000 people. Today, the population of Gaborone is estimated at 150 000. It has been reported to be the fastest growing urban center in Africa. There is great contrast between the tall, modern, glass and concrete high-rise buildings in the city center and the self-help-housing areas scattered all over the city. For a city that has grown so rapidly, and one that was originally planned and designed to accommodate only 20 000 people, the city planners of Gaborone are doing a good job.

With increased urbanization, the growth of Gaborone has overspilled to the peri-urban settlements of Tlokweng, and Mogoditshane, and to the nearby settlements of Gabane, Metsemotlhaba and Mopane. As a consequence, a situation of uncontrolled development is occurring at the edge of the planning area boundary and this is taking place against the backdrop of unplanned development. There is an urgent need to arrest this situation.

The original village of Gaborone was set up by the colonists around 1887 on the banks of the Ngotwane River. The name came from Gaborone, the king of the Batlokwa. In 1891, the railway came and 4 km to the west, Gaborone station was built. The administrative headquarters of the Bechuanaland Protectorate had actually been located in Mafeking, South Africa. With independence coming in 1966, it was decided in 1962 to locate the new capital in Gaborone. Among the reasons for this were: the availability of water; public land; best communications (rail and the north-south road); and some existing infrastructure to site developments. At the time the population was about 3000 and Gaborone was the administrative center for the Gaborone District, including the tribal villages of Tlokweng and Ramotswa (7).

In 1962, all that existed of the present Gaborone was a railway station with a few land grants, a hotel, a store and approximately 3.5 km to the east the "Government Camp", housing the Protectorate Government officials, a store, a church, various government offices, etc.

THE PLANNING OF GABORONE

The First Master Plan for Gaborone: A Segregated Town

With the selection of Gaborone as the capital, the administration of the time accordingly set up plans for the new capital. By 1963, a Master Plan had been prepared by the Public Works Department in Mafikeng. The new town was placed between the railway Station and the Camp.

The 1963 Master Plan was based on two main principles: that the town should form a complete entity at each stage of what was seen to be an unpredictable rate of population growth; and that vehicular movement should be segregated from pedestrian movement as far as possible. The town was not meant to have more than 20 000 inhabitants, mostly government officers. Service levels, road capacity, and dam capacity were all planned for that number. The original layout did not assume any growth due to in-migration of job-seekers.

Population Forecasts Exceed Expectations

Although no firm forecasts had been made, the expectation had been that the minimum assured population of Gaborone would be about 5000 after the removal from Mafikeng was complete and that thereafter the town would grow by about 7500 within

20 years. It was also expected that there probably could be some additional growth of people who were attracted to town life, and that an increase to 10 000 or even 15 000 could be expected over 20 years, i.e. by 1990.

In fact, by 1971, the population was 18 700; it had nearly attained the ultimate planned population within a period of five years. This growth included, a squatter community of about 6000 people; largely the result of failure to foresee and provide sufficiently for low-income families. The original plan assumed that about half the population would be low income whereas the current proportion is nearer to two-thirds. Thus in 1971, land remained available from the original Plan for the accommodation of about 10 000 people, more than half of this land was committed for the rehousing of people from the squatter community at Naledi.

The Wilson-Womersley Master Plan

In 1971, it was decided to extend the original town towards the north into the Broadhurst Farm, which was owned by the State contrary to the original concept. Inter alia, the Wilson-Womersley Plan provided for a large degree of income-group mix to overcome criticism of what was in practice still a socially segregated town. President Sir Seretse Khama had objected to the type of economic segregation used in the "garden city" model of the first plan. This was found to be politically unacceptable, and he instructed the physical planners to come up with some more egalitarian proposals for the new areas to be planned in Broadhurst.

The concept that was chosen was to mix low-, medium- and high-cost housing areas both in this area and later throughout the town. This has made Botswana town planning an object of study by professionals from other countries. Every unit which is a catchment area for a primary school or a local center contains all the different categories of housing in the proportions anticipated for that development phase. This has now become an accepted principle in Botswana.

The Plan also stated that: "It will be vital for government to do what it can to keep average rates of immigration to the towns under control" (7). That this did not prove possible made the recommendations inadequate almost from the start.

The Expansion of Gaborone to Broadhurst: Broadhurst II Plan

Almost immediately, the next phase of planning for Gaborone called Broadhurst II was put in to operation. This provided for far more site and service development as the original conceptions of 15-20% site and service had already proved inadequate. The plan also looked more deeply at transport and road costing. A second industrial area was also planned as the original industrial extension (Extension 13) had been completely settled by squatters who were by then well established.

By 1978, there were 42 500 inhabitants, of which 10 000 were living in Old Naledi, which prompted a special upgrading scheme in the late 1970s. The growth of the Town and Regional Planning Department enabled further extensions to Broadhurst to be done in-house. These extensions took the planned development up to the limit of state-owned land.

Expansion of Gaborone to the West over the Railway Line

The Gaborone West Structure Plan was based on continuous growth in accordance with market demands. The Plan has been characterized as a kind of Milton Keynes concept, where large neighborhood units or super blocks are delineated by primary roads and communication routes.

This concept which focuses on communications, is probably much better for a town which may expand indefinitely, but the concept is still in use today in the planning of several super blocks in Gaborone West.

The initial gross miscalculation of Gaborone's growth rate was exacerbated by delays in the construction of housing in Gaborone West. Drought and recessions have also resulted in an unplanned sprawl of housing, commercial and industrial activities in the villages of Tlokweng and Mogoditshane.

The Greater Gaborone Plan: 1994–2011.

The population growth rate of Gaborone in the last three decades shows a decline from 12.9% between 1971–1981 to 8.4% between 1981–1991. A recently completed Development Plan for the Greater Gaborone Area for the year 2011 assumes a further slowing down of population growth to 6.2%. This gives a population of 229 350 in 2000 and 532 404 in 2014. By then almost all the vacant State land within the city will have disappeared. Imaginative forward planning is needed to be able to accommodate the envisioned development in the city.

THE DESIGN ASPECTS OF THE CITY OF GABORONE

In the planning of Gaborone, the DTRP and the City Council have relied on a vast range of policy tools and institutions to achieve proper urban design and urban policy objectives. The Gaborone City Council uses Master/Structure plans; zoning, subdivision regulations, building codes, urban development standards and other public policies to shape development. These regulations have all been adopted to help protect the urban natural environment, gear infrastructure investments with development and maintain and enhance property values.

Urban Design

The urban form of the city of Gaborone is a combination of both concentric and grid-iron patterns quite visible in some parts of the city. The older parts of the city have concentric and cul-de-sac road patterns whereas in the new areas in Gaborone West, the grid-iron pattern is becoming prominent. The city is composed of a series of modules consisting of 20–30 plots (based on the m^2 per person standard for local open space) or 30–50 plots (based on the m^2 per person standard for local open space), plus the necessary access roads, pedestrian ways and the semi-permanent open spaces. The two to four modules are added together to form a second layer of units which are subsequently added together to form neighborhood units or 'environmental units'. These are clustered around major open spaces, primary schools, civic/community plots and with a well functioning secondary road network. These neighborhood units are again clustered together and eventually form super blocks consisting of secondary schools, training centers, local centers, industrial areas and primary roads (Fig. 1).

Land Use

Zoning: In the past, the Gaborone City Master Plan was based on rigid, large-scale block zoning, with industrial, commercial and civic and community land uses assigned specific geographical areas. Changes of use were heavily controlled and no mixed uses were allowed. This was traditional blue print planning. Although by and large this works, it has constraints to spatial proximity to work and even leisure. However, with the introduction of the new Development Control Code of 1992 it is now possible to be more flexible in land-use zoning. Mixed land-use zones are today allowed where appropriate; e.g. a corner shop in a primarily residential area.

Redevelopment: There has been a steady change in the land-use pattern in the older residential parts of Gaborone like New Canada, Bontleng and also near the Central Business District. In this area, due to lack of office space in the main Mall, residential areas are being turned into offices, shops, beauty parlors or surgeries. Redevelopment is also taking place with the accent

on vertical development, to increase densities and maximize the use of the land. This shift to higher densities leads to a more economical use of land.

The problem brought about by development is that the original infrastructure (roads, water reticulation, sewerage capacities, etc.) were not meant to cope with these increased densities. If the trend continues unrestricted, expensive urban renewal schemes will have to be embarked upon fairly soon.

Fast Urbanization and the Price of Land: With the fast growth of the city has come a shortage of building land and this in turn has sent the price of land soaring. Today, the waiting list for plot applications is over 5000. State land residential plots now go for anything from P 10 000 in the low income areas to P 50 000 in the high income areas. It is not land in itself that is expensive, but the cost of servicing. In Gaborone West, the newest part of the city, the cost of creating a 1000 m^2 of plot of fully serviced land is between P 6000 to P 7000. Of this only about P 25 or about 0.4% is spent on land, the rest being accounted for by water, drainage, roads, electricity and sewer construction works. In the Site and Service areas, the average plot costs nearly P 2000 with under P 10 being for land price. Even if the land cost is omitted, it makes almost no difference to the "high cost of land" complaints of almost every resident in the city.

Commercial Development: The concept of commercial centers in the city of Gaborone has changed over time, reflecting changing needs. In brief, for the older part of Gaborone (east of the railway), the concept was to have one main center (the Mall), a few subcenters (Broadhurst Mall, Bontleng Mall, the Station Area and the African Mall). These were to be supplemented with small centers in every environmental unit (i.e. primary school catchment area).

In the commercial areas, plot sizes range from 400 m^2 (10 m x 40 m) to 5000 m^2 to accommodate small retail shops up to chain stores. Plot coverage may be as high as 100% and building heights is flexible.

The old local center concept made sense if the primary concern was to provide commercial services close to the people. However, studies undertaken for Gaborone West Structure Plan clearly indicated that the catchment areas were too small to secure even low-key subsistence business and the service provided was hence poor. The studies further indicated that the catchment area had to almost triple to secure decent turnovers for the businesses involved and offer acceptable services to the inhabitants. Hence, the catchment areas and walking distances had to be increased or past trends had to prevail. This controversy has been resolved by offering small areas for open markets in each neighborhood unit, where hawkers and small businesses can sell their goods and offer some basic services within the neighborhood unit.

A Master Plan for a new Central Business District to complement the existing Main Mall has just been completed (Fig. 2).

Industrial Land Use: The city of Gaborone has three well dispersed and planned industrial areas supplemented by small in-

Figure 1. Cluster module in Gaborone West.

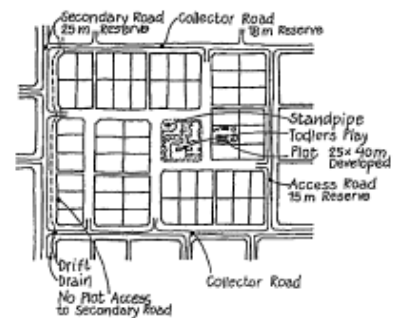


Figure 2. Master Plan for Central Business District of Gaborone.



ustrial sites here and there. Jobs are well dispersed in the city and hence less travel time and a reduction in traffic congestion are possible.

Industrial Areas: plot sizes are used for three levels of industrial activities: large, medium and small scale. For the large industrial activities, plot sizes used are above 20 000 m² and small industrial plot sizes are from 800 m² to 500 m².

Social and Community Services and Facilities: There are ample social and community facilities and services located in all the local centers of the city to meet the demand of the residents. Higher level services like the a referral hospital, the university, main post office, and the like are located in or around the Central Business District.

Open Spaces: Lack of a clear vision of the provision of open spaces for the city has resulted in disjointed planning of the open spaces. Open spaces of various types have been provided ranging from play areas to city parks. Local open spaces are provided at 10 m² per household to cater for the needs of residential population. Previously, local open spaces were 20 m² per inhabitant which resulted in 100 m² per household. Open spaces are provided within a walking distance of 50–75 m from each household.

Major open spaces are provided at 6 m² per household. The previous standards used in the old part of the city were 10 m² per inhabitant. These major open spaces provide the necessary sports fields, play areas, recreational parks and other needs. For a neighborhood of about 700–800 plots, an area of 3–5.5 ha is usually provided.

Several landscape master plans for various parts of the city have been prepared; e.g. for the university, Government Enclave, etc., but they are as yet unimplemented and are lying on the shelves of these institutions. The City Council has just completed a full-scale landscape master plan for the entire city, implementation of which is expected soon. There are proposals to fully

landscape and utilize the various streams dissecting the city, plant trees and flowers in all the open spaces contained in the City Master Plan and introduce measures to control the misuse of the open spaces.

Residential Development

It is obvious that residential areas have been progressively restructured to consolidate and improve relationships between housing, job opportunities, services and transport. In order to provide for effective autonomy of community-based groups has meant increasing access to basic resources for locally determined and self-managed housing programs. The authorities have provided enabling tenure in the unplanned and site and service areas, credit and building materials for house construction.

Following a national quest to conserve land, the city has been forced to go for smaller plots, especially in the new areas of Gaborone West. The reduction of plot sizes has been in response to economic constraints in order to make plots more affordable by private individuals, especially the low income. Plot coverage has been increased from a maximum 33.3% (8) to 50% (1992 Code) (Table 1).

In most cases housing areas are composed of vast single storey, quite new and modern units, only recently have alternative developments like town houses and flats been introduced. This has led to massive urban sprawl, vast consumption of land, and increased travel distances.

Residential development mainly takes place in large blocks termed "Communities", which are normally composed of several neighborhoods each with its own commercial center. Recently, a new Development Control Code of 1992 has relaxed zoning by allowing "no-nuisance" informal economic activity to take place within residential plots. The above arrangement is an enabling strategy to allow easy proximity between resi-

dential areas with jobs and also commerce.

All residents have good spatial access to line infrastructure like water, electricity and sewerage, which are provided within the plot.

Similarly, social infrastructure like schools, health facilities and other facilities are amply provided for in the super blocks and hence are within reach of all residents (8). Open spaces are provided in graded levels to satisfy everyone living in the city.

Housing development in the city can be categorized into two main sections: (i) The public sector which provides accommodation both to public officers and to private sector workers. Botswana Housing Corporation (BHC) is the main developer for this category as well as being the landlord. The corporation has constructed a variety of low, medium and high cost houses/flats in Gaborone, as well as in other towns. The corporation also has a home-ownership scheme. BHC provides 31% of the housing stock; the self-help site and service program (SHHA) 45%, and the rest comes from the private sector. As of March 1990, BHC owned 8335 housing units nationwide, of which 5289 are in Gaborone, and it receives on average 40 to 50 applications per week (9). (ii) Private sector housing is built by estate agents or companies or through individual efforts. Site and service housing, mainly for the low-income bracket, is constructed by individuals through the SHHA. Plots are given at a subsidized price; easy credit is arranged through the Botswana Building Society with minimum collateral required and a building materials loan is given to whoever needs it. In addition, an enabling security of tenure is given either through giving a Certificate of Title (Fixed Period State Grant) or a simplified title known as the Certificate of Rights (COR). The FPSG enables ownership of the plot to be freely transferred on the open market and changes the form of payment for services from a service levy to domestic rates. The COR is an easy method of providing secure tenure as it does not involve the expense of legal fees or cadastral surveys. The state guarantees the tenure, and the plot holder receives a certificate which sets out his or her rights and obligations, including the obligation to pay a service levy. The certificate specifies no time limit, and the rights can be inherited, and may be transferred, subject to the approval of the Council. SHHA residents can, if they so wish, convert the COR into a fixed period State grant.

INFRASTRUCTURE AND TRANSPORT

The existing infrastructure in Gaborone has been placed under considerable strain by the rapid growth of the city, particularly pressure from higher density developments in the older parts of the city. Expansion and upgrading programs are being followed by the authorities responsible for water, roads stormwater drainage, sewerage disposal, telephone, electricity and postal services. Most have development plans up to around year 2000, which attempt to provide services to areas where infrastructure has lagged behind and to cater for new developments in an orderly manner.

Water: Water is provided on-site for medium and high income areas whereas for low-income areas it is provided in communal standpipes in the older areas and from 1992, on-site. It thus means that people have access to water, irrespective of whether they can afford it or not, which is an advantage for the low-income persons.

Electricity: There is an abundance of electricity to meet all needs in the city. In the past on-plot electricity was not provided to the least disadvantaged, but from 1992 all new residential areas will be electrified.

Sanitation: All areas are sewered except in low-income areas where people, until recently had to depend on pit latrines. From 1992, the policy is to provide waterborne sanitation to all SHHA areas. However, the proposed system of waterborne sanitation

will constrain the least advantaged with affordability being the greatest problem. The majority of plot holders may not be able to afford the cost of the on-plot servicing of the dwelling or the cost of the necessary sanitary ware.

As noted in the recent review of the SHHA Program (10, 11): The long-term externality effects of environment in the form of waste of scarce freshwater resources, inherent in conventional waterborne systems are likely to be high. Considering the scarcity of water in Gaborone, it appears doubtful that a waterborne solution, even with comparatively low water use and low levels of evaporation in an aquaplant for purification, is suitable in Gaborone. More environmentally sound and sustainable alternative solutions should, therefore, be tested, adopted, and if necessary, subsidised for the least advantaged.

Refuse disposal: Access to basic refuse collection and disposal is universal in Gaborone and in some areas this service is now slowly being privatized. This access needs to reflect a growing concern for environmental care and resource conservation, by requiring sorting at the source. This will make feasible the necessity to recycle materials such as glass, paper, metal and plastics and to compost decomposable matter.

Transport and communication: Past trends in the growth of transport in the city of Gaborone show that there is an increasing rise in car ownership and traffic volumes in the city. Left unattended, this will lead to more congestion, pollution and longer travel patterns.

Transport services will benefit people by greater access to a wider choice of jobs, education, shopping and social opportunities. Car owners take a high level of access for granted. However, people on low incomes, those for whom low-cost housing programs are initiated, have only limited access to transport other than by walking or hitchhiking (12).

Road reserves: The city is served by trunk roads and primary roads mainly linking the super blocks and by secondary roads and tertiary roads that serve the local neighborhoods. The provision of road reserves and carriageways with their associated drainage channels contribute to a high proportion of infrastructure costs. In the past, these were rather excessive and planners in collaboration with engineers have had to work out smaller reserves. The road reserves width and carriageways are based on agreement with the Ministry of Local Government, Lands and Housing, Botswana Power Corporation Water Utilities Corporation and the Telecommunications Corporation (Table 2).

Pedestrian routes are provided on both sides of the primary road (national), primary roads (local), on all roads in and around commercial centers, and on one side of the secondary roads and tertiary roads (industrial). Pedestrian ways are provided with a minimum of 1.2 m and cycle routes where provided have a minimum width of 3 m.

Only a third of the roads are tarmacked, the rest being gravel or earth roads. The existing urban road system is varied both in structure and standard. The carrying capacity of most of the roads, especially the distributor roads, are seriously constrained due to poor standards of construction, restricted road junction conditions, frontage accesses to houses and some institutions, numerous pedestrians and lack of road control. To increase traffic flow and achieve greater control, a series of traffic lights have been introduced in various parts of the city.

Private transport: Although development of taxi and bus services has taken place, with a few exceptions, the level of usage of these two modes is very modest. A recent survey of transport activity in Gaborone and its environs has yielded information which can help in charting a solution to the transport problems of the city. For example, in low-income housing areas by far the dominant mode of transport is walking, followed by public transport. High-income groups by contrast make more trips per household, but few are exclusively walking.

The rapid growth of traffic in Gaborone, combined with the

development pattern has put the road network under great strain. Between 1979 and 1983 traffic grew by 10% overall, and between 1983 to 1994 traffic has grown by about 30%.

Car ownership in Gaborone has also increased from 6110 in 1983 to 30 503 in 1990. Today one-in-three households have some sort of a vehicle (15). Statistics show that in 1990 Gaborone had 40.9% of all the vehicles in Botswana. The implications of this traffic growth for the existing road network are alarming.

Coupled with the rise of traffic is a high accident rate. Gaborone now has an accident rate equal to, if not more than, cities of similar size in the developed world where car ownership is higher. The government has tried to intervene with road-safety campaigns and road improvements, but success is still low. The growth of city traffic has also exacerbated environmental problems such as noise and air pollution.

Public transport: Public transport in Gaborone which is made up of private buses, taxis and shared taxis leaves a lot to be desired in terms of efficiency and road worthiness of vehicles. Most of the vehicles overload and over speed and the accident rate of this mode of transport is very high. Although the government has tried to improve the system by fixing routes and timetables, it is still not attractive enough to lure potential passengers. Some areas, especially the newly built and high income areas, are still without transport.

Pedestrian movement: In Gaborone, pedestrian pavements are usually inadequate are seldom paved, landscaped or properly maintained. However, recently, pavements have been built, new walkways provided, flyovers and underpasses built over busy roads, and zebra crossings marked on roads.

Cycling in the city: People should be encouraged to use the bicycle since it is economical, healthy and does not pollute the environment. Gaborone has ideal conditions for cycling—plenty of space, flat terrain, good climate, etc—but few bicycles are in use. Some attempts have been made to mark off a small cycling lane along the major roads in the city, but using this narrow strip is both dangerous and little comfort. Who is to blame: both the town planners who have not demarcated such lines within the city; the transport planners and engineers who have not bothered to build the few cycle ways shown on master plans; and the general public of the Botswana who perhaps view cycling as below their dignity; and lastly motorists who care little for cyclists sharing the same road.

Possible Solutions to the Transport Systems:

Several options exist to improve transport services in the city, particularly for the low-income groups.

I. Increasing the supply of transport available and affordable to low income groups. A study in 1993 advocated the introduction of vehicles with much higher seating capacities. However, a number of obstacles need to be overcome. For example, to operate a fleet of large vehicles would most probably require some form of government financial assistance, at least in the initial stages of transition from the present small vehicle fleet. Existing operators are generally not able to command the resources needed to acquire and operate a fleet of large vehicles. At present, however, public-sector policy is to stay out of areas where the private sector can provide the services sought by the community.

II. Changing the way the city is built to bring services (shopping, work places and recreation) closer to low-income housing areas. Urban sprawl, apart from a waste of scarce land, is costly and leads to problems such as greater distances to work.

From a transport point of view, higher urban densities can help by:

- reducing the tendency for people to use inefficient modes particularly low occupancy private car travel;
- increasing the potential to introduce high capacity public trans-

port systems which depend on users living within easy walking distance of stops.

A Roads Department sponsored Trunk Roads Study and the Gaborone City Council Traffic Study, are using traffic models for Gaborone which are calibrated to local conditions and allow the user to test the effect of different densities of development in the zones representing the city. Densities in the model are represented by the number of households and employment in each zone.

III. Raising the spending power of low-income groups so that they can participate in the "motorized" society by:

- increasing the charges applied to users of less efficient modes (private cars) particularly where they are prime contributors to congestion. In some countries, road pricing is being explored as a way of decreasing the use of private vehicles in congested places and during traffic congestion. The proceeds from increased charges can be directed at improvements to public transport which can directly benefit low income groups;
- providing low-income groups with subsidized access to public transport through the issue of tokens according to the extent to which an individual's income falls below a predetermined minimum. These tokens would be valid for trips on public transport and public transport operators would be reimbursed by government for the equivalent fare when the tokens were returned.

PUBLIC PARTICIPATION IN THE DEVELOPMENT OF THE CITY

Within the planning process of the city, there are built in mechanisms for public consultation and participation. Some of these procedures are statutorily provided for in the Town Planning Act (16) and related legislation. Both oral presentations, formal written requests for opinions and the media are used to let people know of impending developments in their areas and people are given a chance to voice their feelings for or against a proposed program. Both Ward Committees, NGOs and other interested parties participate in public enquiries and presentations.

Within the SHHA, the most clearly elaborated procedures for participation/consultation have been those established for the Old Naledi upgrading project. These procedures included: taking existing roads, paths and plot boundaries as the basis for planning; discussion with individual residents about the boundaries; discussion with ward groups about road alignments, stand-pipe location and the displacement of residents; use of local labor in debushing for new roads; arrangements for appeal to an adjudication tribunal; and individual discussions between technical officers and residents about house plans (17).

However, public participation is still not good enough and it is not uncommon to find the public complaining that they are not consulted enough in planning matters. It is recommended that planners communicate with those affected by new plans.

ENVIRONMENTAL CONSIDERATIONS AND PLANNING

Several studies in Gaborone show that most residents in the city are very conscious about the major issues affecting their environment. Topping the list are the problems of indiscriminate littering, particularly of plastic bags, beer cans and empty bottles that are discarded. The second problem is the lack of maintenance of open spaces in the city—many have turned into spaces where garbage is thrown indiscriminately. Third is the lack of greenery, both mature trees and ornamental flowers and shrubs. The absence of these in most parts of the city makes the city environment dull and devoid of beauty.

People are also aware of social problems and issues such as unemployment, rising crime and inflation which appears to be

denuding their meagre incomes.

Several campaigns have been mounted to clean the city, collect rubbish and plant trees. These campaigns are mounted either by the City Council itself, central government, school environmental clubs, CBOs or NGOs. Pressure groups like *Environment Watch Botswana*, which is an action oriented NGO established in 1991 at the University of Botswana has participated in tree planting in open spaces in the city, litter picking, cleaning of open spaces and environmental awareness campaigns through hosting panel discussions and talk shows at various institutions. However, more could be done at the personal level rather than depending on government or the City Council to initiate such programs and policies.

FINANCING THE DEVELOPMENT OF GABORONE.

The Gaborone City Council was created under the Township Act (Cap 40:02). The Council can raise own source revenues by passing bye-laws that are approved by the Minister and published in the Gazette. The revenue sources of the Council include taxes collected from the inhabitants; rates; rents from properties owned or administered by the Council; money derived from licences or permits issued by the Council and all taxes, dues and fees imposed under lawful authority of the Council and royalties, donations, contributions, endowments, reimbursements, grants from Government and any other money which may by law be paid to or received by the Council.

According to Income and expenditure figures, the city's income has been rising slowly in comparison to expenditure. The greatest source of income is Revenue Support Grant from Central Government, which in most years is nearly 50% or above of all revenue; followed by rates and the service levy. Money from other sources is quite meagre. This reliance on Central government deficit grants is not very satisfactory as it makes financial planning and development of projects very difficult.

What is clear is that the Council cannot continue to be too dependent on central government for financing and that new sources of revenue must be found. What is feasible?

Potential sources of revenues the Government could authorize the Council to impose include imposing a percentage rate of tax on the government's pump prices for petrol and/or diesel fuels; setting a tax on the monthly charges for water, power and telephone services. The tax can be imposed as a percentage of the utilities charges due; Setting a tax on gross sales revenues of commercially licenced businesses; and, the Local Government tax that used to be applicable in the past should be reintroduced. Only in this way can the Council manage to spearhead development within its boundary.

CONCLUSION

By and large the city of Gaborone is well planned, navigable, relatively pleasant, and development is taking place in an orderly manner. In order to keep pace with anticipated growth, the city authorities are making plans for growth in advance, and for services before land allocation is decided. Unlike several urban areas in the subregion, infrastructure deployment in Gaborone has not lagged behind development. Again, there is a good cadastral, registration and tenure records that can facilitate appropriate land management within the city boundaries.

For cities to be successful, there is a need to have an urban land policy framework that incorporates sustainable mechanisms for recovering the costs, public sector infrastructure investments, a public sector enabling strategy to support the private sector land development, and, an urban-planning framework for co-

Table 1. Residential plot sizes in Gaborone (13, 14).

Housing category	Minimum/Maximum plot sizes (m ²)
High Income	
Large	800-1000
Medium	500-700
Small	400-450
Flats/town houses	100-200
Middle Income	
Upper income	375-400
Lower income	300-375
Low Income	200-300

Table 2. Road reserve standards used in Gaborone (13, 14).

Road type	Road reserve (meters)	Carriageway (meters)
Primary road (national)	60	7.5
Primary road (local)	45	7.5
Secondary road	30	6.5
Tertiary collector (industrial)	20	6.5
Tertiary collector	18	6.0
Access road	15	5.0

ordinating spatial development so that the land requirements of a growing economy like that of Gaborone, can be met with the least amount of adverse environmental impact. The financial program must be sustainable. This means that, to the fullest extent possible, the users and beneficiaries of the system should pay for it. The key feature of this new approach is the stress placed on market-responsive planning systems, where urban land-use planning aims to support and encourage new development not to stifle it. The provision of urban services should be expanded to unserved informal areas as well. A bulk of the residents here are willing to finance the costs of infrastructure if the terms are affordable. This will require that governments show flexibility in infrastructure standards and costs.

Despite the buoyancy of the urban economy, the Gaborone City Council has difficulty in mobilizing resources. What is needed is financial reform—not merely as a means of increasing local revenues, but also as a means of linking the delivery of municipal services more closely to financing, and increasing local control over the level and mix of municipal services.

References and Notes

- Silitshena, R. 1990. Urbanisation in Botswana. *Norsk Geogr. Tidsskr.* 38.
- Government of Botswana. 1992. 1991 Population Census. Central Statistical Office. Government Printer, Gaborone.
- Dickson, W.L. 1990. *Land Tenure and Management in a Developing Country*. Botswana. N.I.R. (University of Botswana) Research Paper no. 54. Gaborone.
- Ministry of Local Government and Lands. 1983. *Urban Development and Land Policy*. Government Printer Gaborone.
- Euroconsult. 1992. *Accelerated Land Servicing Programme: Quarterly Report No.5*. Gaborone. (Mimeo).
- Mosha, A.C. 1993. *Are Planning Standards Compatible with the Needs and Aspirations of the Low Income?: The Case of Botswana*. Paper published in the proceedings of an international conference on planning legislation in Africa. Windhoek, Namibia, 29 March-2 April 1993.
- Wilson and Womersley (Planning Consultants). 1971. *The Planning of Gaborone*. A Consultancy Report. (Mimeo).
- Development Administration Group. 1983. *An Evaluation of the Self-Help Housing Agencies*. September. Gaborone.
- Botswana Housing Corporation. 1992. *Annual Reports and Accounts 1991/92*. Government Printer, Gaborone.
- Maendeleo (Botswana). 1992. *Review of the Self-Help Housing Agency*. Gaborone.
- Viking, N. 1993. *Principles of the Planning of Gaborone*. Paper presented at the seminar: Landscape and Urban Design in Botswana 19-22 October 1993. Gaborone.
- Howie, D. 1994. *Transport Issues in Gaborone*. Seminar Paper: Urban Design and Low Cost Housing, 6 September. Unpublished.
- Government of Botswana. 1991. *Urban Development Standards*. Government Printer, Gaborone.
- Government of Botswana. 1992. *Development Control Code*. Government Printer, Gaborone.
- Government of Botswana. 1990. *Transport Statistics*. Central Statistics Office. Government Printer.
- Government of Botswana, *The Town and Country Planning Act*. Government Printer, Gaborone 1977.
- Nostrand, J. van. 1982. *Old Naledi, the Village Becomes a Town: An Outline of the Old Naledi Squatter Upgrading Project*. Gaborone, Botswana, James Lorimer and Co. Toronto.
- Mosha, A.C. 1993. *An Evaluation of the Effectiveness of National Land Policies and Instruments in Improving Supply of and Access to Land for Human Settlement Development in Botswana*. United Nations Centre for Human Settlements, Nairobi.

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