

Estimating land budgets

To manage the growth of a town or city requires an assessment of how much land will need to be urbanised over a five and ten year period. Of course, there are many external factors which will influence the area of land required. These include national and regional economic investment and development patterns, human or environmental disasters within the hinterland which could lead to mass migration, the regional alternative centres and the availability of land.

Whilst these external factors will be significant and are difficult to predict, uncertainty can be reduced considerably by estimating demand for land based on those factors which are easier to predict.

Planning regulations and standards will influence the area of land required for all officially approved development. The most important considerations will be:

- Density levels for specified types of housing (based on minimum official plot sizes, occupancy levels, plus road widths).
- Projected demand for commercial and industrial land, and land for new housing development
- Requirements for communal facilities such as schools, clinics, religious sites, public open spaces, etc, at central and neighbourhood levels
- Topography and ground conditions (e.g. steep slopes, load-bearing capacity, vulnerability to flooding, etc)
- Accessibility of available land

Assuming an inexhaustible supply of land available and suitable for development, density requirements will be influenced by the efficiency with which available land is developed. The regulatory framework of planning regulations and standards will directly influence this, though the creative skill of planners and designers will also be important. The efficiency of land developments will be influenced by the following factors:

- The proportion of available land in private use (residential, commercial or industrial).
- The proportion of land allocated for communal facilities, such as schools, clinics and places of worship, etc.
- Minimum and average plot sizes.
- The widths of roads, way leaves etc., especially in residential areas.

A gaming simulation exercise is available on the CD-Rom entitled '[Playing the game: Designing appropriate and affordable settlements](#)'. This provides guidance on how to plan residential settlements which are appropriate to local needs and make minimum demands on external subsidy,

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Densities and road reservations;

Another key determinant is the minimum width of road reservations. In any settlement of 10,000 plots, for example, the total length of all local roads will be several kilometres. If road widths are wider than needed for safe travel by pedestrians and vehicles, then reducing them by one metre would save 1000 square metres for every kilometre of road length, or ten 'free' plots of 100 square metres each. Applied across a town or city, this can produce a large number of additional plots for a given land area, thereby saving on the total land area needed, reducing the capital and maintenance costs of road area and utility services and reducing the total costs of housing significantly.

It is worth remembering that in residential areas of central London, where car ownership is extremely high, road reservations of 7 metres are common.

Example from India:

The access roads for 'Low Income Group' housing can be provided by a 3m pathway with a contention that the car ownership in LIG group is rare. This has substantially reduced the area under the roads and access. In the sites and services projects with World Bank assistance, open spaces and pathways are grouped together further reducing the width of pathways to 1.00 meters. Without compromising their functionality.

Plot size and density levels:

Minimum and average plot sizes play an important part in determining residential densities and therefore housing costs. For example, if the minimum official plot size for individual dwellings is 200 square metres, it is unlikely that more than 33 plots per hectare can be achieved. At an average household size of 5 persons, this would yield a maximum density of 165 persons per hectare. For plot sizes of 100 square metres, twice as many dwellings and people can be accommodated on the same area of land. This halves unit land costs and substantially reduces the costs of installing services. Thus if 10,000 units are needed at an average density of 33 units per hectare, this will require 303 hectares of land. If density levels are increased to 66 units per hectare, the area of land required is halved to only 151 hectares.

Regulatory frameworks need to take into account the implications of densities, plot sizes and plot dimensions on total land areas and housing costs.

Example from India;

In India during the early eighties the minimum plot size was 150 m² and the max density allowed was 80 units per hectare. The size was reduced to 25m² for low income group housing and the corresponding density increased to 400 units per hectare. This has substantially reduced the cost per plot of land and infrastructure.

Land use efficiency;

International experience suggests that an efficient layout will be one that allocates 65 percent of all developable land within a residential development to private plots. This leaves 20 percent for roads and public open space and 15 percent for communal facilities, such as schools, clinics and places of worship. Assuming that the providers of communal facilities pay the full cost of the land and buildings, this means that the 65 percent of private land has also to carry the cost of the 20 percent 'non-productive' public land, giving a ratio of 30 percent additional costs to be met by residents or the development agency.

If the proportion of land in private plots is only 50 percent of total available land, and public areas represent 30 percent of the total, this increases the unit cost of private land as it means that the 30 percent area has to be paid for by the productive 50 percent, resulting in a unit cost increase of 60 percent.

In developments intended to benefit low-income groups, it is therefore vital that the regulatory framework enables developers to make the most efficient use of available land to reduce unit costs.

Example from India;

In the sites and services projects assisted by the World Bank, the proportion of land allocated to open spaces and social facilities have been reduced to increase the saleable area from 65 to 70 percent of the gross scheme area. This has increased the gross density and reduced the development cost.

