

Urban Unitisation: A Measure in the Context of the Epidemic

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Abstract

The unit city is a high-quality model for the functioning and management of cities during an epidemic. This model can make people's life highly convenient, considerably improve the quality and effectiveness of epidemic prevention and control in cities, substantially minimise urban traffic demands, and ease urban traffic congestion. During the epidemic, people can live and work within units, and being quarantined becomes convenient for them. During the epidemic prevention and control period, cities can function normally, and people's lives and work can remain unaltered. The unit city idea provides a new approach to cities' functioning and management during an epidemic.

Keywords

Unit City; Epidemic Prevention and Control; Unitisation; Mixed Land Use.

1. Introduction

In the view of the chaos caused by the early industrialisation of cities, the Athenian Charter proposed a partition structure of cities. The main urban functions are work, life, recreation, and transportation. Cities are divided into three areas according to three major functions, namely work, life, and recreation. Structures are reasonably arranged in terms of spatial relationship and scale, achieving a balance between their functions. A transportation network is established to link work, life, and recreation areas. With the increase in cities' scales, traffic problems resulting from the partition structure become increasingly serious, that is, transportation networks fail. When cities enlarge, the partition structure leads to several problems, such as waste of transportation resources due to tide traffic, inefficiency induced by inconvenient functional support, and traffic congestion and even paralysis, which are the structural problems of cities.

To resolve the problems caused by the partition structure, a functionally mixed structure was proposed. Dividing cities into function-based areas on a large-scale leads to inconvenience, inefficiency, long-distance trips. Function mixing and land use mixing are remedial measures, rather than fundamental solutions. Functionally mixed structures aim to provide a balance between work and residence. The most serious problem caused by partition structures is the tide traffic. However, this problem can be solved by achieving a balance between work and residence. Functionally mixed structures pursue convenient and compact layouts. Areas related closely to urban functions are linked together to minimise the traffic and considerably improve efficiency. Functionally mixed structures form urban functional structures and achieve structural functions. However, we should not blindly and haphazardly mix functions. We should properly mix the functions, and coordinate various elements to fulfil cities' functions.

People did not know how to control as the COVID-19 turned into a pandemic, please specify the are/population that refers to the epidemic.

when the COVID-19 broke out, which exposed the weak control of the epidemic in the cities that are divided with functions. The experience of the prevention and control of communities indicated that keeping cities functionally and spatially independent within a certain spatial

scope is beneficial to urban governance. Therefore, we proposed a concept of the unit city to Alternatively, you may use “address” the epidemic.

2. Concept of Unit City

With function division, demands for traffic between each area of large cities have increased, thus forming a huge complex transportation network. The larger is a city, the clearer is the division, the more diverse and disperse are starting points and destinations, and the more complex is the transportation network. This network can be made simple if within a certain area, work, residence, recreation, and supporting areas are matched reasonably through a reasonable functional configuration and if the travelling of people is confined within these areas to the highest possible extent. This area can be called the urban unit, and a city constituting several such urban units is a unit city.

An eco-city unit comprises several communities, work areas, urban recreation parks, and public and municipal facilities. Therefore, it is a mixed functional area that includes work and residential areas, and its functions are matched within the daily work and residential areas.

3. Concept of the Flat Management of Unit Cities

With an increase in the scale and number of system levels of cities, the efficiency gradually decreases. To improve the efficiency of large cities, daily traffic should be separated from long-distance traffic and confined within units. Moreover, the current management mode should be shifted towards the flat and unitised management mode, thus promoting functional unitisation.

4. Urban Unitisation

The unitisation of urban functions enables the three major functions, namely work, residence, and life, to be resolved within a neighbourhood, rather than over long distances.

Cities should unitise space to match urban function unitisation.

Slow traffic within units should be constructed using transport means such as walking and bicycle. The use of low-speed cars can be allowed. In general, the eco-city unit can be planned according to a maximum rectangle with a side length of 4 km, or a maximum circle or an octagon with a 2-km radius.

The travel distance on foot and by bicycle is generally 800–1000 m and 4–6 km, respectively. Therefore, the eco-city unit can be planned according to a maximum rectangle with 6-km length and 4-km width, or a maximum circle with a 2 to 3km radius, which basically corresponds to the service area in an eco-city unit. If the unit is planned according to the aforementioned areas, the residential area can account for approximately 1/3rd of the total area of the eco-city unit, that is, approximately 5 km, and the controlled population in each eco-city unit can be within 100,000.

Each unit can ensure that a person can reach the overall living facilities by walking and bicycle. Simultaneously, to ensure that residents live comfortably and that the environment is well protected, the greening rate of the eco-city unit should be $\geq 45\%$.

5. Unit Function Configuration

If the problem of functional configuration of eco-city units is solved, and the function of each unit is similar, the traffic between units can considerably decrease. Due to working areas, urban ecological units often exhibit their own characteristics based on the concept of heterogeneous centres. Furthermore, a certain amount of traffic is generated between units. When dividing units, we should adopt the principle of proximity and prevent the formation of crossing routes.

Ecological urban units do not exclude partial polarisation and undertake the function of urban characteristics. The huge traffic generated by these units can be overcome by public transportation, especially rail transportation.

6. Requirements of Unit Planning

When a city is large, its unit size can be correspondingly large. By contrast, its scale can be small. The unit construction model should be diverse.

Units can be flexibly divided according to the existing boundary, without any clear boundaries. The suggested area of each unit can be 10^2 – 40^2 km, so that residents can travel using a non-motorised vehicle or a slow (25 km/h) motor vehicle.

In the road design in ecological city units, pedestrian and bicycle traffic should be given priority. Walking should be encouraged in the unit city. Motor vehicles should move slowly, and motor vehicle lanes should not be largely wide. In traffic between units, high-capacity public transport should be given priority to meet the necessary requirements for travel between units.

A balance of employment and housing is achieved, and widely diverse goods and services are provided within the unit.

The unit city is not physically segregated but is functionally and structurally segregated. People live and work within units, and being quarantined is convenient for them. During an epidemic, such cities can function normally, and people's lives and work can remain secured. The idea of the unit city provides a new approach to the functioning and management of cities during an epidemic.

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