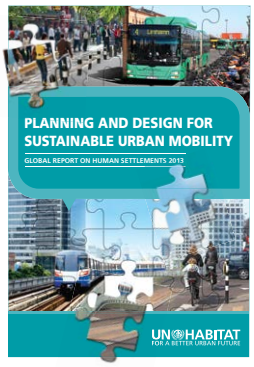

PLANNING AND DESIGN FOR SUSTAINABLE URBAN MOBILITY

GLOBAL REPORT ON HUMAN SETTLEMENTS 2013

Urban Form and Challenge for Public Transport

Urban planners must take a holistic and integrated approach to urban mobility, including urban form in order to provide sustainable, effective and affordable mobility for all, says the United Nations Human Settlements Programme, UN-Habitat.

According to the *Global Report on Human Settlements 2013 - Planning and Design for Sustainable Urban Mobility,* providing cost-effective public transport in an urban setting remains an enduring challenge to city managers because present urban forms continue to influence travel habits and patterns.

"Neglecting the connection between land-use and mobility creates urban sprawl and makes the provision of effective public transport systems virtually impossible," says UN Under-Secretary-General and UN-Habitat Executive Director, Dr Joan Clos. "Transport planning and land-use planning must go hand in hand. Well-planned cities like Singapore, Stockholm and Curitiba, with crafted cogent visions of the future to shape transportation investment, achieve the best outcomes."

The importance of density and distribution

Urban form has many characteristics; density is one. In areas where residential and job densities are low, reliance on cars is high and the provision of public transport unprofitable. Generally, 3,000 inhabitants per square kilometer is the accepted density needed to provide public transport services at a reasonable cost.

For example, Hong Kong, one of the world's densest cities, also has one of the world's few profitable public transport systems and yet public transport patronage averages comparatively low transit trips per person. This may be because many destination trips are close to each other, resulting in an extraordinarily high number of trips on foot. In car-dominant cities like those in the United States, Canada, Australia and New Zealand providing public transport is more difficult. Cities in these countries need a minimum of 3,500 people and jobs per square kilometer to create enough passengers to cover the costs of public transport.

Spatial distribution of city residents and places of work is another urban form. The spatial distribution of where people live, work, shop and socialize defines the location of trip origins and destinations, and therefore the length and transport mode (public or private, motorized or non-motorized). Urban land cover, city compactness – described as the degree to which a city's footprint approximates a circular rather than a tentacle-like shape – and the rate at which densities taper with distance from the city centre will all affect public transport provision and impact the need for private motorized transport.

Land cover and density gradients

North American cities take up more than twice the land area as those in South America, which consume slightly more land than European, Asian and African cities. Still, in this respect, cities in developing countries display the same tendencies as those of the more developed. In 20 years (1991-2011), Bandung (Indonesia) expanded from 108 to 217 square kilometres, the report says. Of the newly built-up area, 60 per cent was formerly farmland or open space, 17 per cent was leapfrog development with non-adjacent pockets of residential or commercial buildings, the rest redevelopment of existing built-up areas. Similarly, from 1985 to 2000, land area of Ghana's capital, Accra, grew 153 per cent, twice that of its population. Most of this urban expansion was an extension of city boundaries into former farmland.

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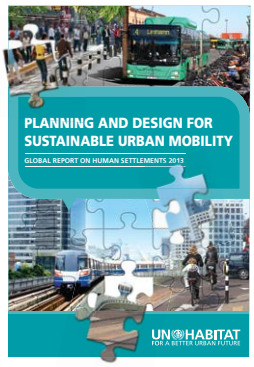

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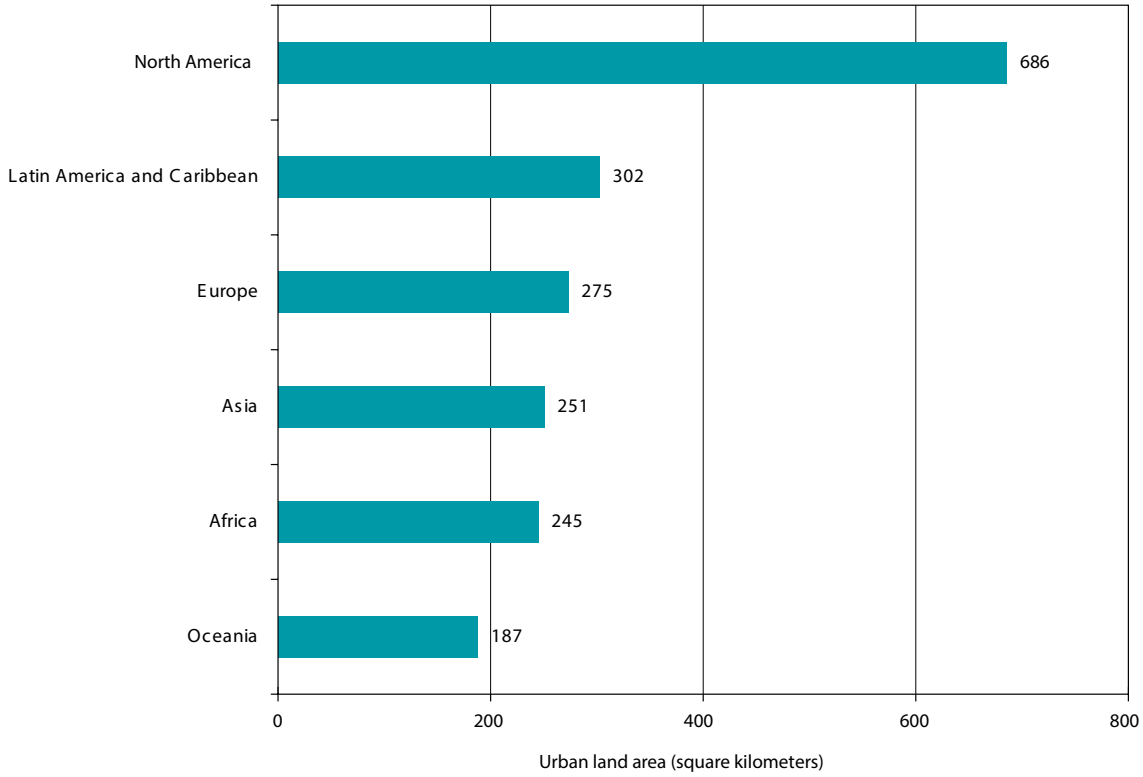
Figure 5.5: **Average land coverage by region, among 1366 cities (2000–2010)**



Leapfrog development requires often costly extensions of sewer lines and piped-water. It is also, by extension, a public transport challenge to provide services to far-flung suburbs.

The rate at which city population densities taper with distance from the city centre - technically known as density gradient – is generally sharp in Asia and Europe. This is typical of a metropolis with a strong centre, also termed as monocentric. Contrastingly, density gradients in the United States are more flat, an indicator of urban sprawl and of a car-orientated urban form, enhanced by zoning laws, rising wealth and high-capacity freeways.

This type of development, however, increases distances from city centre to outlying areas and encourages private car use rather than public transport. Likewise, decongestion of most Indian city centres, by restricting the floor space index (i.e. the floor space allowed to be constructed per unit of land area), effectively limiting the height of buildings and therefore density, has pushed growth to the city outskirts. Such a decongesting of the city centre increases the length of trips and the prevalence of motorized transport.
Making the suburbs work

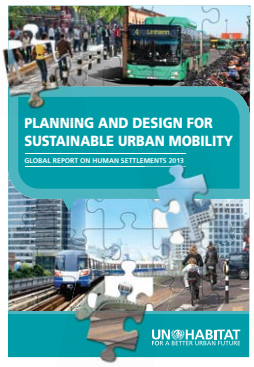


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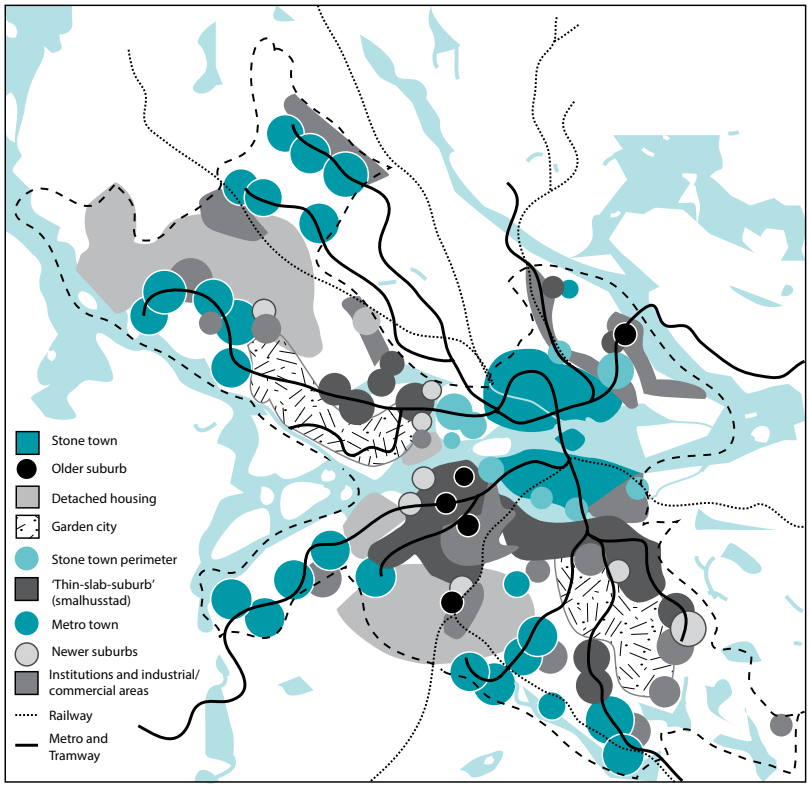
Figure 5.16: **Stockholm's necklaceof- pearls built form**



Some cities, though, have encouraged mixed land-use in the suburbs. This means that housing, offices, shops, restaurants as well as strip malls are located in these areas but are served and connected by public transport corridors. Scandinavian cities like Stockholm, Helsinki and Copenhagen have created networks of linked transport-oriented corridors. The mixed land-use of such an urban form encourages public transport use and produces balanced, two-directional traffic and passenger flow, the report says.

Along a linear pattern of rail stations, and within 10 to 15 kilometre stretch of corridors along the rail lines, there is a mix of jobs, housing, retailing and population services. In such an urban form, traffic and people move in many different directions during peak hours. This way, public transport is efficiently used in both directions. In very centralized urban forms, a public transport system may be under-utilized despite being over-congested during peak hours because trains in the other direction are running empty. Curitiba in Brazil perhaps best exemplifies how lineal and well-articulated densities along busways are conducive to urban mobility.

Globally, there has been a lack of adequate investment in public transport. In most developing countries, urban public transport is poor and insufficient. A major reason for this in many countries is that subsidies for public transport were reduced due to liberalized economic reforms. In Africa, for example, publicly owned and managed public transport entities were disbanded in the 1990s due to mandated structural adjustment policies. Re-establishing city or government-run public transport systems today requires considerable public investment, at too high a cost for many developing countries. Some countries, such as Brazil and South Africa, have been able to overcome these challenges to provide efficient public transport systems.

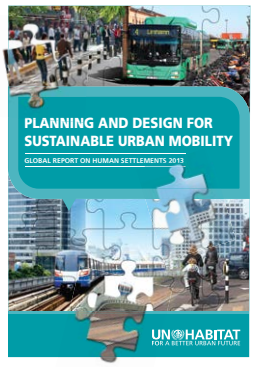


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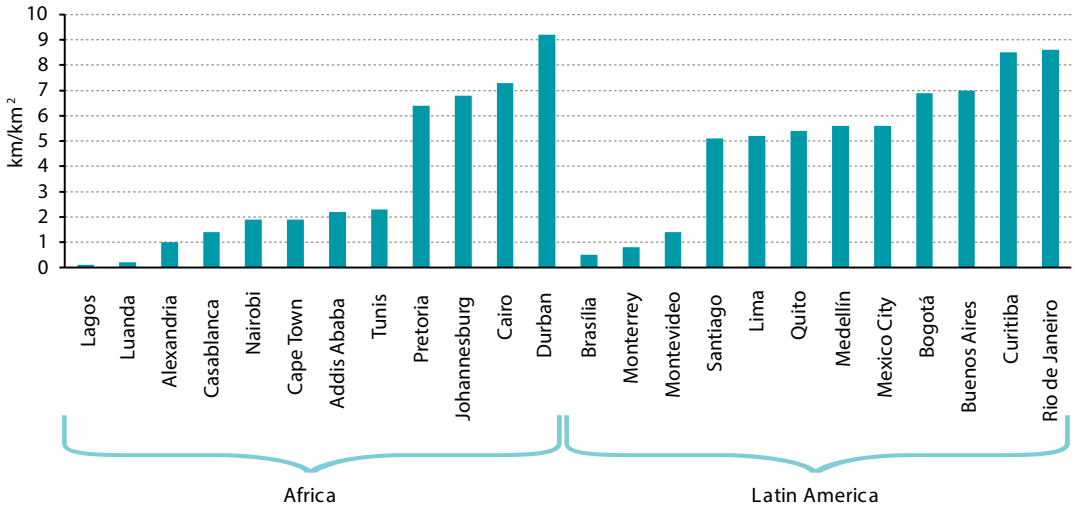
Figure 2.8: **Length of urban public transport, selected cities in Africa and South America]**



The transport challenge for urban planners and managers remains how to provide public services. Persuading people in urban areas to use public requires services to be extended, to be of high quality, flexible, modally inter-connected and coordinated, affordable, and to meet the needs of the majority.

Conclusion

- Urban form must be taken into account during mobility planning.
- Increasing density and the compactness of a city can facilitate access for its citizens.
- Mixed land use encourages a more even spread of housing, work and services and a more efficient use of public transport infrastructure as travel flows will be in all directions during peak hours.
- Urban sprawl is dominating the growth of cities in developing countries which further exacerbates the challenge of providing affordable public transport systems.

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