

Figure 5.14

The ratio between road network length and residential area has remained almost steady over the last 40 years in Helsinki, Vienna and the Ruhrgebiet. In Dublin, however, the development of residential areas was not followed by an equivalent growth of roads.

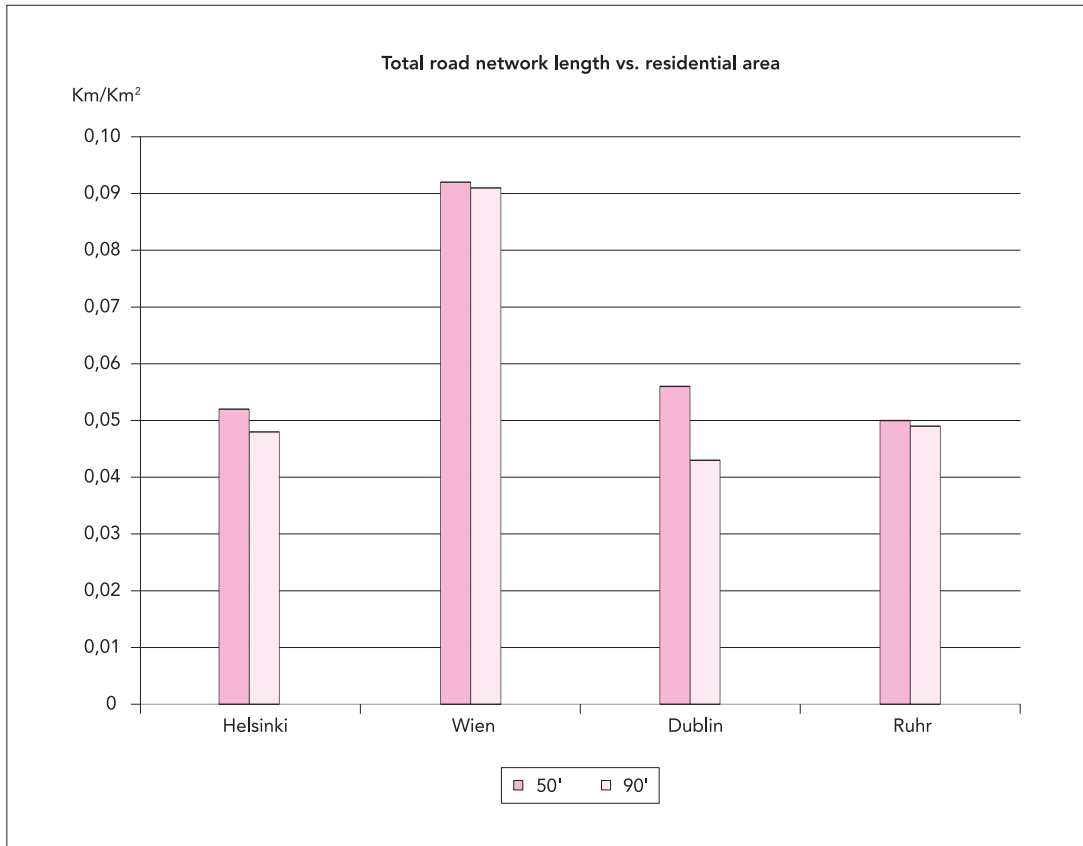
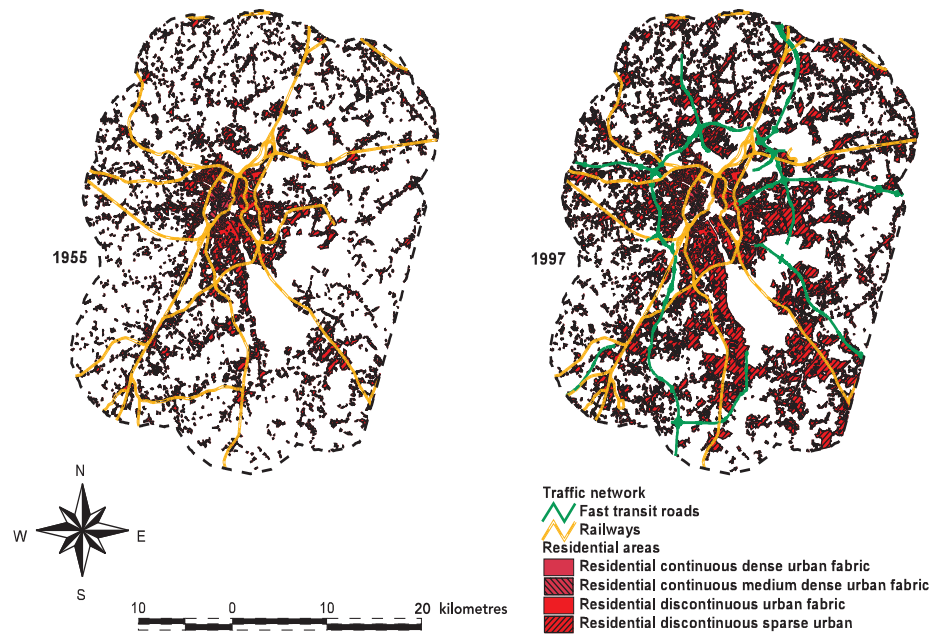


Figure 5.15

Correlation between the growth of residential area and the development of main transport features in Brussels from 1955 to 1997



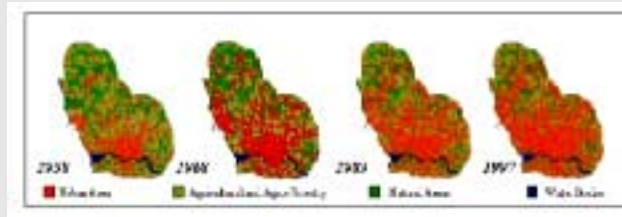
5.1.3. Artificial areas

Urban growth follows certain patterns, depending on a number of driving forces including land ownership structure. Three typologies of urban growth were considered: continuous (new developments taking place

in continuity with previous urban areas); linear (urban growth along the existing road network); and discontinuous growth (not supported by existing urban areas or the road network).

Box 5.1: Urban growth typologies in Porto (Portugal)

Porto metropolitan area is following the general European trend, with the urban area augmenting increasing while population decreases in the city centre (Porto municipality). The Porto urban area has changed from a discontinuous growth typology towards a continuous typology. If in the sixties 1960s the urban development started in a disorganised way from the single rural property, afterwards but then the process turns became continuous while and the gaps are being progressively closed. The result is the disappearance of natural areas, which used to be dedicated to agriculture and forestry, facilitated by the decreasing economic importance of the agricultural sector.



Land use dynamics clearly show a trend towards the increase of impervious areas, residential as well as industrial and commercial areas. However, the fraction of urban area occupied with residential areas is decreasing. This may lead to the conclusion that, even if during the last ten 10 years the population was stagnating (1 % growth rate), urban areas are increasing at a rate of 21 % rate, of which only 12 % is residential. The remaining urban area is mainly occupied with commercial and also public facilities.

Using the Murbandy/Moland database information on urban growth typologies and its their evolution identifying trends can be derived and relevant information for local urban planning provided.

decrease of green areas pressured as a result ofby the construction of artificial areas. This phenomenon occurs mainly at the periphery of cities. On the other hand the analysis of cities' evolution shows an augmentation of the proportion of service areas.

Industrial and commercial areas

During the last four decades, the general trend throughout Europe has been the

Industrial and commercial units evolution in Lyon (France) from 1956 to 1997

Figure 5.16

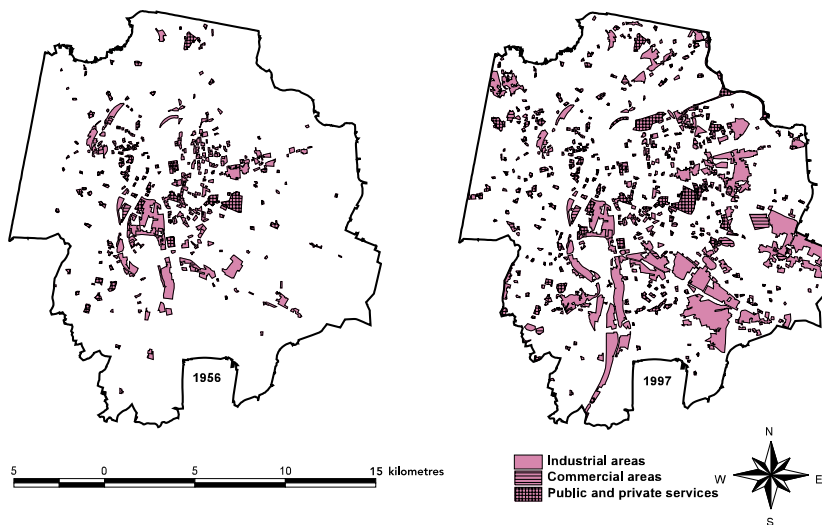


Figure 5.17

Evolution of industrial and commercial areas evolution in Sunderland (GB United Kingdom) from 1971 to 1996

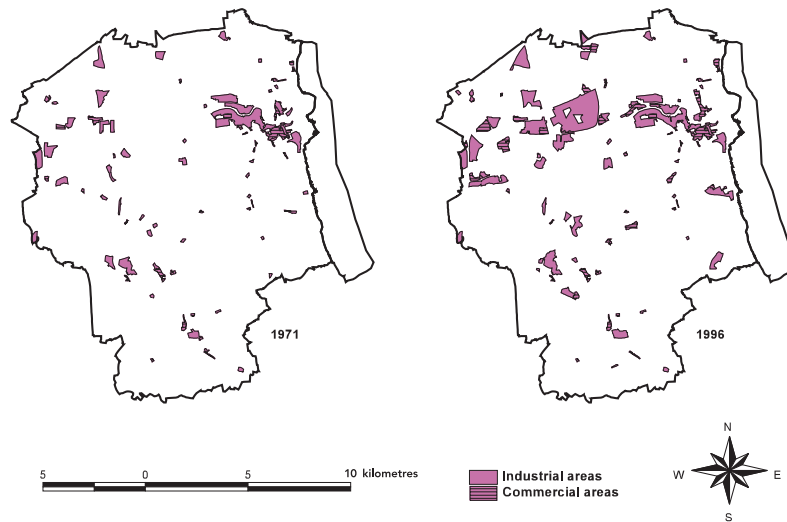
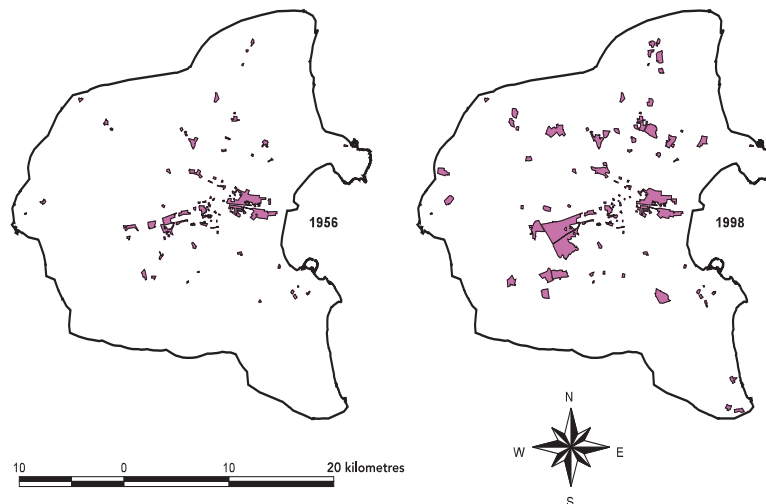


Figure 5.18

Industrial areas evolution in Dublin (Ireland) from 1956 to 1998



Since cities experience an increased demand for public facilities, as parks or transportation, the rate of growth for residential areas is smaller than that of the total urban areas. For instance, in Oporto, through the analysis of the Murbandy/Moland database enhanced with demographic data for each decade, it is possible to verify that even though the population is stagnating (1 % increase) the urban areas are increasing at a 21 % rate for the same period. Nevertheless only 12 % of the increases are of residential areas.

However, their increase does not always follow the same growth rate the overall artificial structure. In particular, the Murbandy/Moland database shows that for many cities the percentage increase in artificial area is bigger than the increase in green area. This particular aspect should be further investigated, since the proximity of green urban areas to residential units is considered an important indicator of urban sustainability. Section 5.2.1. of this report dedicates more emphasis to the potential support offered by the territorial database for tackling this issue.