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Curitiba: the challenge of the sustainable city
Maria do Rocio Moraes do Rosario

The Master Plan of Curitiba, approved in 1966, aimed mainly at establishing an urban planning model indicating the passage from a radial form to a linear model, and at the same time at outlining the requisites of an new economic basis for the city. The Instituto de Pesquisa e Planejamento Urbano (IPPUC) was created in 1965, its function being to guide the implementation of the master plan to make it flexible and adequate for the continuous transformations of the local physical, political and economic conditions. In pioneer form and without importing technologies, the plan adopted as its main instrument the integration of public transport and land use and road system policies. The urban space was thus defined through soil occupancy policies that privileged the areas where it was more convenient and pleasurable to live, in accordance with the possibilities of the administration to provide the necessary public services, with particular reference to public transport. At the beginning of the Seventies the process of carrying out the plan was started with Avenidas estruturais, conceived as a guideline for the linear development of the city, at a tangent to the traditional centre. The concentration of commercial and residential functions that ensued from this, strongly transformed the pattern of the city: almost thirty years later, these thoroughfares form part of the urban landscape and are visible not only at human scale but also in satellite images. The main characteristic of these Eixos Estruturais is called the

'trinary system': a central 'bus lane' with slow side lanes for local traffic and two external one-way 'counter-avenues' (district-centre-district) for rapid continuous vehicular traffic. The immediate consequence for buses using the preferential lane was shorter trip times, apart from lessening the overload of private traffic on the road system, especially in the areas of intense traffic. The adoption of this linear model of development made it possible to carry out a pilot initiative in Brazil, that is it enabled pedestrian circulation to be fostered by closing off the central commercial streets to vehicular traffic. These actions tended above all to emphasize the human scale and to favour the aggregation of citizens. For this purpose, the actions of a physical character were integrated with many other cultural and social actions. In the course of the years, the city has increased its cultural choices through the reusing of historic buildings, the Teatro Paiol and the Centro de Creatividade do Parque São Lourenço, thereby regaining possession of the roots of its culture.

Public transport: engine of development and of social integration

Public transport has been and still is the main driving force of development in Curitiba's growth process. The creation of its integrated transport system started in the Seventies with the conversion of eight conventional lines into two lines (the North and South express lines) located in separate lanes, with priority right-of-way along the entire route. Through the terminals situated along it, in the districts and in the central area, these lines, called linhas alimentadoras, transport the passengers who come from the districts

adjacent to these thoroughfares, in this way creating an integrated transport system. The buses were designed mainly for this purpose, with special visual requisites and colours that differentiate the express lines from the secondary ones. In the course of the years other types of lines were added, such as the linha interbarrios which links the various city districts in a circular route. In the Eighties this system gave rise to the Integrated Transport Network (RIT) which enables users to move from one point of the city to another, using a number of lines (express, secondary and 'interbarrios') and paying a flat rate. The 'single social fare' is a mechanism whereby short trips finance the longer ones, which concern the outlying districts with low-income inhabitants. In 1991 the system gained a fresh impetus with the construction of the Linha Direta, known as 'Ligeirinho' because it makes only a few stops. Boarding and alighting from the bus take place through the Stazione Tubo, the fare being paid in advance. Handicapped persons in particular are helped in boarding and alighting from the bus by a platform situated on the same level as the bus. In 1992 the RIT started using 'biarticulado' type buses, having a greater carrying capacity (270 passengers). With this system a 50% reduction was obtained in energy consumption compared with that normally required for the bus fleet. These initiatives, thanks to the energy saving achieved, earned for the city a recognition from the International Institute for Energy Conservation: to reduce even further the pollution caused by the buses, a new fuel called biodiesel produced from plants has been tried out. The RIT formed by

exchange centres (nodes) and, as stated, by express, secondary, 'interdistrict' and direct lines, is completed by other lines having specific routes: conventional lines which connect up the various districts, nearby municipalities and the centre; the *linha circular centro* which serves the central streets of the city with micro buses reserved for short runs; and the Tourism line whose route takes in the public parks and other tourist sights of the city. Apart from this, transport with special functions is provided for children, there is a special 'educational' line, and there are inter-hospital lines that connect the city's main health centres with each other. Today the RIT transports on average 2.11 million passengers every day and connects the capital with 13 other municipalities of the Curitiba metropolitan region.

Conservation and development: an equation with many-faceted results

The boost of economic development established in the Master Plan started in 1975 through the creation of the Curitiba Industrial City (CIC), in the western part of the municipality, planned to concentrate productive activities in municipal territory. In the CIC, which is a significant example of the whole city, three areas have been set aside in the zoning process, one for work, one for living and one for leisure pursuits; these are all three integrated with the structural axes, thus forming a district well inserted in the urban pattern. But the most evident feature has been the ban on setting up industries that cause pollution, which evidences a strategy of the municipality's development policy that is strongly correlated with the idea of environmental conservation. At the end of the Eighties,

when Curitiba assumed for all the role of ecological city, based on this general awareness, various institutional projects and programmes have been carried out, as these ecological principles were broadly accepted by the population as routine actions. The scattered location of parks in various parts of the city has led at district level to the concept of 'environmentally correct'. Furthermore, the systematic, continuous application of the method of environmental education has strengthened the various operations aimed at protection, conservation and renewal of the environment. Conservation of the environment, at the time a concept still in its beginnings in the national debate, was implanted in the city through actions of flood prevention, preserving the valley bottom lines and the green areas, and extending the drainage network. The areas of conservation have become areas for leisure pursuits, giving rise to the first parks, the old quarries have been transformed into cultural and educational spaces: the Arame Opera, the Parco Tangá and the Universidade Livre do meio Ambiente (Unilivre). The result of these actions, today, can be recognized in a city that is aware and proud of its environmental conquests, a city with one of the highest ratios of green areas per inhabitant in the country, distributed over 29 parks and woods. The thematic parks materialize the ethnic background to the local society, paying homage to the immigrants who contributed with their culture and their customs to the city's identity. At the same time, the various linear parks and the 110 km of cycle paths favour greater familiarity of citizens with their pleasant urban environment.

One of the most important questions regarding urban sustainability is, without the shadow of a doubt, the location of the solid wastes produced in the city, which started to be considered in Curitiba in 1989 with the creation of a differentiated collection programme, called *Waste that isn't waste*. This project covering the whole city is still in force today, and is correlated to essential environmental questions: environmental education, separation of organic and inorganic wastes, and final destination in a technically and hygienically adequate rubbish tip. In parallel with the project described above, the programme *Green Change* was created, an action of intense integration with the community, in which recyclable waste is exchanged with food products in the city outskirts. Groups of environmental educators attribute to a number of families up to three minimum wages, provided they are bound up with the community organization. These families, in routine situations, select the wastes considered to be inorganic and exchange them for fruit and vegetables from small producers in the green belt around the metropolitan region. The material collected is sent for recycling to a factory which selects and makes the best use of the wastes, located about 20 km from Curitiba; they are then sent to social institutions for the products to be sold. The proceeds are donated to social programmes. There are other services complementary to differentiated collection, such as the collection of toxic wastes (batteries of mobile phones, etc., tins of paint) and of hospital wastes. In Curitiba environmental questions are always connected with other

actions aimed at guaranteeing that the project of the maximum development of the city is carried out. For this reason, and for the projects tackled to be effectively implementable, a continuous evaluation process is necessary. As a function of this, a project which started in 1995 to monitor the quality of life in the city, assesses the conditions of life in the various areas of human settlement by means of indicators (environmental, transport, health, housing and security-related), reflecting the main questions linked with city life and urban space. This process, which is based on information obtained empirically and *in loco*, enables the urban planning process to be enhanced and optimized.

Conservation policies for historical and cultural property

The rule of zoning and land use has been a concrete instrument for the urban development of Curitiba. Initially centred on land occupancy and on housing concentration in accordance with the infrastructures foreseen in the Master Plan, these rules have progressively included more specific mechanisms, above all concerned with the conservation of historical and environmental assets and with providing incentives for houses of social interest. Some of these mechanisms, such as the transfer of building potential and of available land, have been in force since the early part of the Eighties and today constitute material under the City Statute. Buildings of cultural value are registered as Units of Interest for Conservation (UIPS). Almost all the 600 buildings were registered between 1979 and 1982, but this figure is periodically

revised, taking into account such analytical criteria as social value, historical value, architectural quality, quality of construction and landscape value. The practical results obtained in the last twenty years are of great value for the explicit contribution they make to the Curitiba scenario. Many constructions, parks and woods, which would certainly have been lost under the pressure of urban growth, are the most evident testimony to the collaboration between public and private sector and, at the same time, to the benefits obtained for the community as a whole.