

Recreating Routes

Studying informal paths in Cidade Satellite housing estate, Natal, Brazil

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Abstract

This paper investigates modifications produced by automobile driving dwellers and visitors to the route system of Cidade Satellite housing estate in Natal, Rio Grande do Norte, Brazil. Founded on the premise that the space configuration is in itself capable of stimulating or inhibiting movement and that the nature of the generated movement is a crucial factor for the appearance and maintenance of certain uses, the study applies line analysis, to evaluate the effects of the adjustments performed. Relations between the global and the local configuration are examined for the designed, built and actual versions of the settlement, through the development of linear representation. By contrasting design proposal, actual construction and residents' action, important issues concerning intention, production and reality that amalgamate in the studied object some strategies adopted by users to overcome the effects of a plan designed under the guidance of the rationalist urbanism proposed in the Carte d'Athenes and in the image of the Plano Piloto in Brasilia are identified and exposed. Through continuous subtle interventions, which the study seeks to demonstrate, users managed to break through space barriers and create "informal roads" to overcome some of the strong segregating effects generated by the original - planned and built - structures.

The Problem

This paper investigates the modifications produced by automobile driving dwellers and visitors to the route system of the Cidade Satellite housing estate in Natal, Rio Grande do Norte, Brazil. By contrasting design proposal, actual construction and residents' action, some of the strategies adopted by users to overcome the effects of the built settlement are exposed and the resulting adjustments caused by the opening of informal ways, by vehicular traffic through the settlement open spaces are evaluated.

Cidade Satellite housing estate is located about 116 km from downtown Natal, and lies on an area approximately 210,000m within the Bairro Pitimbã, together with two other housing estates: Pitimbã and Bancários. The settlement formed by the three estates has precise physical limits: dunes to the North, BR-101 to the East, railway to the West, and the river Pitimbã, which borders the municipalities of Natal and Parnamirim to the South (figure 12). It can be entered by accesses off BR-101 - the main road to neighbouring towns - and off the Omar O'Grady avenue that stretches from Prudente de Moraes avenue - one of the three most integrating axes in Natal's road structure.

Cidade Satellite was planned in 1976 by a team (Borsoi Arquitetos Associados) led by the prestigious modernist architect Acacio Gil Borsoi, through a government housing program and executed by a consortium of ten manufacturers. Completion occurred at three stages, the

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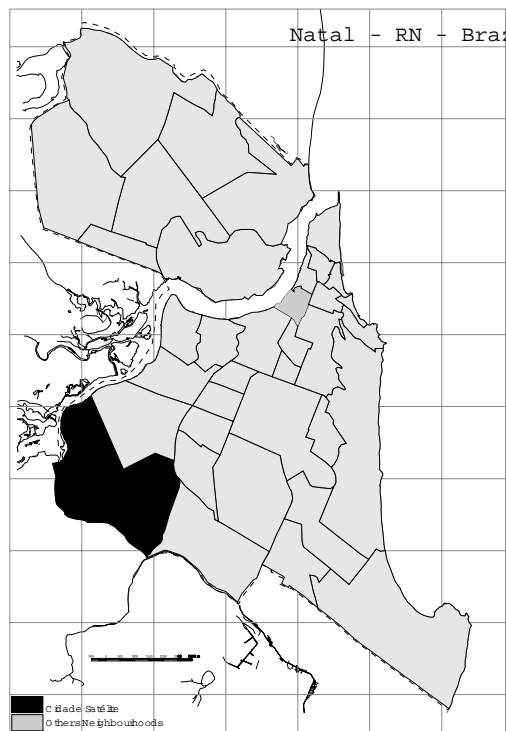


Fig. 12 Plan - Natal and Cidade Satélite

and how two of these stages - as built and as present - relate to the urban complex of Natal. Some examples of previous studies of layout transformations in housing estates in Brazilian cities - Rubem Berta and Jardim Leopoldina - in Porto Alegre, Rio Grande do Sul (RIGATTI, 1999) and that Rio Doce in Olinda, Pernambuco (LOUREIRO, MONTEIRO, TRIGUEIRO & ARAGAO; 1995) have identified important structural changes brought about by residents/users actions to the original settlements. Procedures adopted in those works have been adjusted to the needs and aims of this study as follows:

- (1) the examination of basic morphological aspects such as overall zoning, street grid hierarchy and house/plot/accesses disposition, in the original plan and in the executive blue prints so to identify the proposed and the built versions of the settlement;
- (2) the observation of those same aspects in the site and the recording of their differences;
- (3) the linear representation (over a digital town plan provided by the local water supplier) of the grid system (a) as designed, (b) as built and (c) at present;
- (4) the generation of axial maps and the calculation of respective integration values for the three phases of the object - as designed, as built and actual;
- (5) the observation of the correlation between the integration values of Cidade Satélite at two stages - as built and at present - and that of the larger complex of Natal according to data produced in morphological studies at UFRN (Trigueiro et al, 1998)

Intention

The street grid in the original design plan (figure 7) can be described as an intersection of two axes (labelled penetration roads in the blueprints) that subdivide the estate area into four sections - labelled neighbourhood units - surrounded, each, by a ring road whose

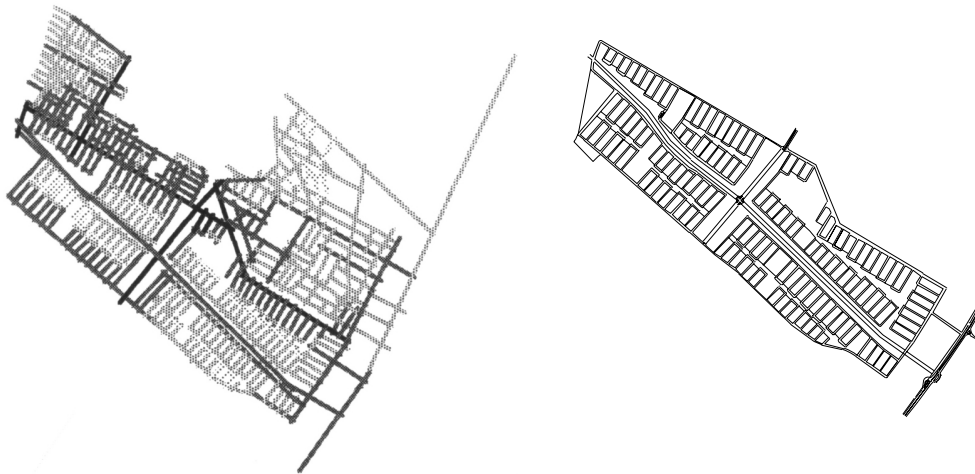
first in 1982, the others in 1983. A total 3.545 units were distributed in four subareas (denominated "Neighbourhood Units" in the original plan), each constituting a residential area, intermediated by spaces designated to specific uses (INOCOOP, 1979). The units (originally seven types) were disposed with aligned facades and backs turned to the local access streets. The designed road system of 164 streets obeys a regular grid plan, hierarchised according to expected vehicle flows.

The composition (and denomination) of the subareas, the functional zoning, the arrangement of houses, plots and local accesses and the hierarchy of the street grid point towards the rationalistic urbanisation proposed in the Carte d'Athenes and bear strong likeness with the Plano Piloto of Brasilia.

Analytical approach

Morphological modelling through linear representation was the basic analytical instrument used in this study to examine differences in the spatial configuration of the designed, built and present versions of Cidade Satélite

outer borders make up a larger ring road encircling the whole settlement. Local access streets generate the neighbourhood unit blocks and link these to the ring roads. Each road type in the network may be defined as follows.



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Penetration roads: orthogonal axes that intersect in the estate's central space and subdivide the settlement into four neighbourhood units. One of the axes links to a major thoroughfare (Prudente de Morais Av.) of Natal, the other to the freeway (BR-101) that make up the main access from neighbouring towns into the city.\

Fig. 1, 7 Axial Map - Cidade Satilite - 'as designed' - Global Integration (Axman)

Ring roads: encircle the whole estate, defining its borders, and outline the perimeter of the neighbourhood units. They also make up the principal link among penetration and local access roads;

Inner access roads: border oblong open spaces stretching in either sides of the horizontal penetration road, which was designed to constitute a communal green area; underground passages for pedestrians would connect (in the designed plans) the open spaces in either side of the penetration road.

Local access streets: "U" shaped accesses, alternate in the back face of the plots, linked by the ring roads and by the inner access ways.

Production

The designed urban grid was not fully implemented. The penetration roads were never built; the Northeast segment of the ring road linked directly to the BR 101 freeway (compare figures 1 and 2 and figures 7 and 8) and the formerly short western segment of the ring road - along the railway - was rectified and prolonged (compare figures 1 and 2). A few minor links, not planned in the original design, interconnected the northeast to the southeast neighbourhood units in two points and others did the same between the ring roads and neighbouring settlements.

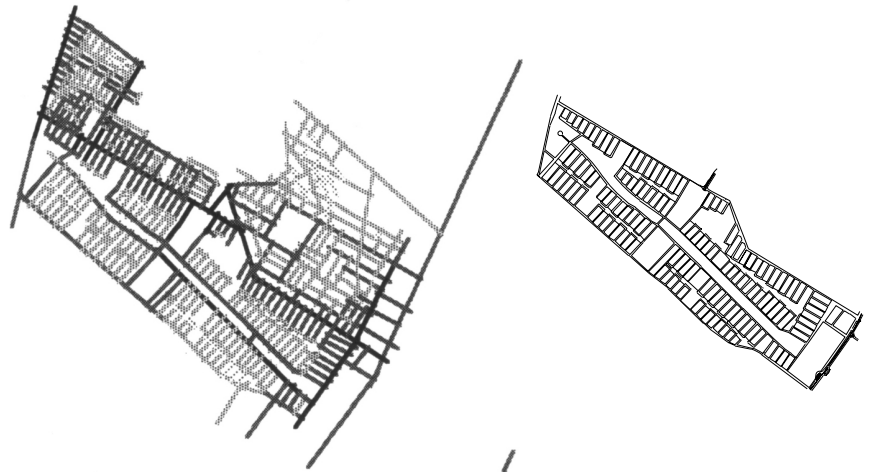


Fig. 2, 8 Axial Map - Cidade Satelite - 'as built' - Global Integration (Axman)

Current situation

The urban grid of Cidade Satelite today comprises the built grid described above (figures 3 and 9), plus a criss-cross of informal paths over grounds designed to become green open areas in the rear plots of the neighbourhood units. These paths, pushed open by vehicles in a slow continuous ant work process unite local access streets thus generating a continuous lane parallel to the inner access roads and breaking through the fragmentation of the 'U' shaped segments. A few other tracks were also forced through the central open spaces so that the northeast-northwest and the southeast/southwest neighbourhood units could benefit from some extra links as compared to what was previously built. These central tracks also access some facilities that punctuate the central area. Whereas most of these informal paths constitute makeshift alternatives for local movement some are slowly being consolidated as important thoroughfares into and from the estate.

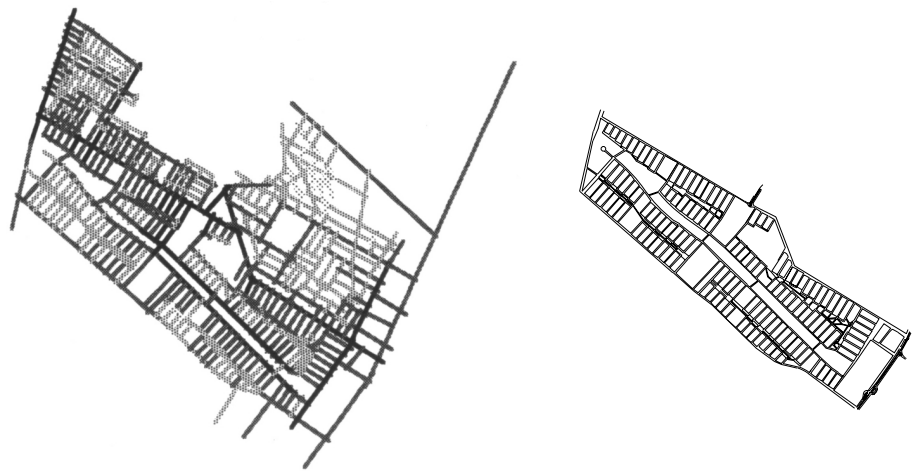


Fig. 3, 9 Axial Map - Cidade Satelite - 'at present' - Global Integration (Axman)

Of axial segregation and creative improvisation

The three studied versions of Cidade Satelite - as designed, as built and at present - were analysed by linear representation (calculated by Axman, Space Syntax Laboratory, UCL). The estate road system was embedded in the surrounding area whose limits are clearly defined by conspicuous landmarks - railway, river, freeway and dunes. By comparing figures 1, 2 and 3 it can be seen that a significant drift to counterbalance segregation seems to have been the purpose of the residents' actions. Almost every bit of the estate gains some integration, especially the sections that were most segregated in the originally built version.

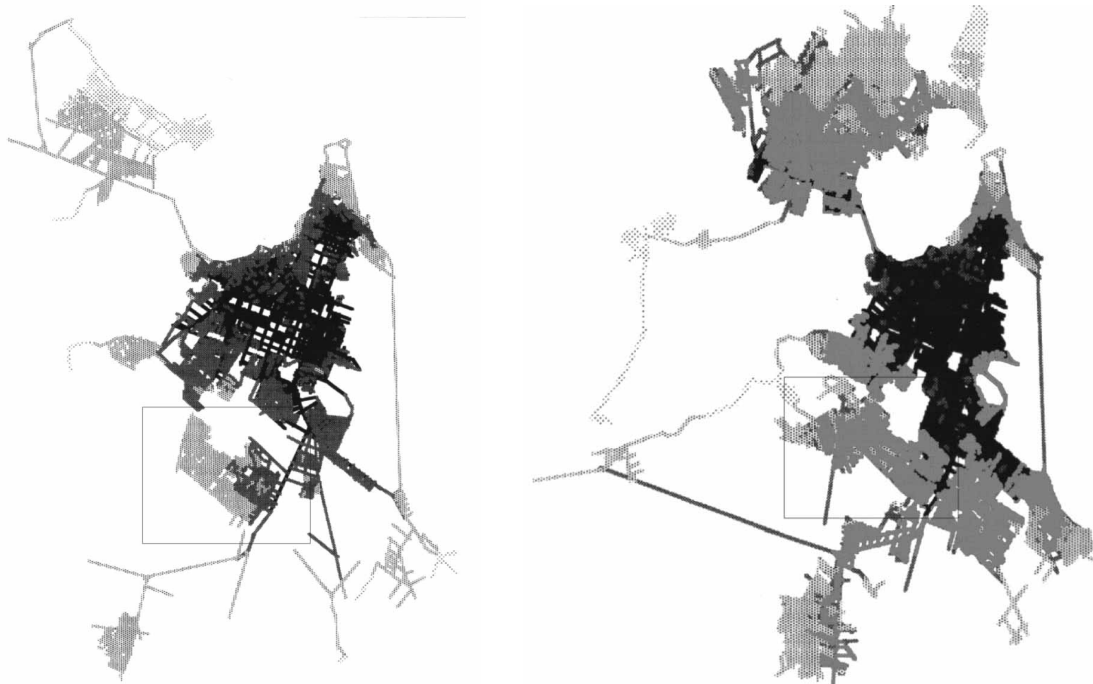
By comparing figures 2 and 3 it can be seen that although the changes in the layout are almost imperceptible, the linear representation exposes a visible shifting in the integration greyscale, particularly in the southeast neighbourhood unit where most composing lines alter from light to dark grey. This subtle but significant - as believed here - gain in integration is confirmed by numerical integration values displayed in table 1, particularly at local (R3) level. Figures 10 and 11 show axial maps of Natal worked out over plans of the city in the late seventies and in the late nineties. The 'built version' of the estate was thus embedded in the whole complex of Natal in the 70's, when Cidade Satelite was built, and the present version embedded in that of 1999.

Table 1
Integration
Values (Axman)
for Cidade (CS)
Satelite

	CS (as designed)	CS (as built)	CS (at present)
Mean Integr. Value (Global)	1.191	1.313	1.394
Mean Integr. Value (R3)	2.220	2.343	2.557

Fig. 10 Axial
Map - Cidade
Satelite -
Complex in
which 'as built'
is embedded -
Global Integra-
tion (Axman)

It can be seen that twenty years of occupation has done little to overcome a notorious



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segregation pattern as regards the urban complex of Natal that has given rise to remarks on the estate being, indeed, a 'cidade' apart, a satellite town. The mean integration values displayed in table 2 present a numerical translation of this fact. The mean global integration value for Cidade Satelite, that was significantly lower than that of Natal altered little from the seventies to the nineties whereas the mean local integration (R3) value that was much lower than that of Natal in the seventies surpassed it in current times.

Fig. 11 Axial
Map - Cidade
Satelite -
Complex in
which 'at
present' is
embedded -
Global Integra-
tion (Axman)

The axial maps in figures 4, 5 and 6 highlights the significant alteration affecting local (R3) integration within the estate's spatial structure.

	CS (as built)	Natal (complex in which 'as built' is embedded)	CS (at present)	Natal (complex in which 'at present' is embedded)
Mean Integr. Value (Global)	0.923	1.059	1.009	1.069
Mean Integr. Value (R3)	2.206	2.556	2.648	2.578

Table 2 Integration Values (Axman) for Cidade Satilite (CS) and Natal

Dismounting the modernist scheme

Although the aim of this work was to demonstrate the strategies used by residents and visitors to alter the spatial structure of Cidade Satilite and not to attempt to discuss these changes within the scope of this essay, a few comments on intentions behind those actions seem worth risking.

It appears quite obvious that residents and visitors to Cidade Satilite have developed a subtle but constant effort in their search for movement alternatives. The informal roads were then an answer for overcoming the great distances generated by natural (i.e. river and dunes) and designed obstacles, such as the enclosed zoning of the neighborhood units and their rigid accesses.

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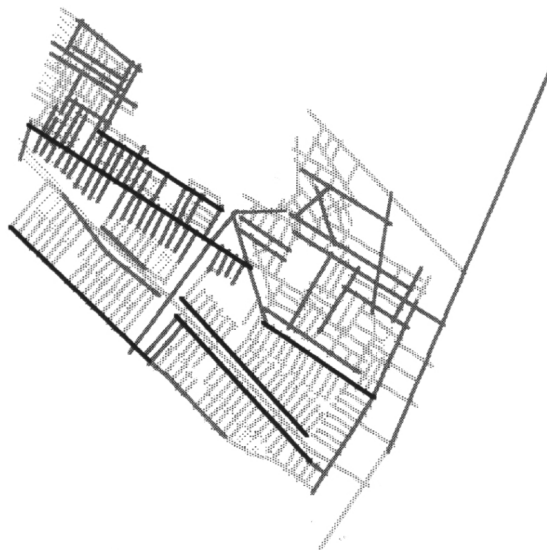


Fig. 4 Axial Map - Cidade Satilite - 'as designed' - Integration 3 (Axman)

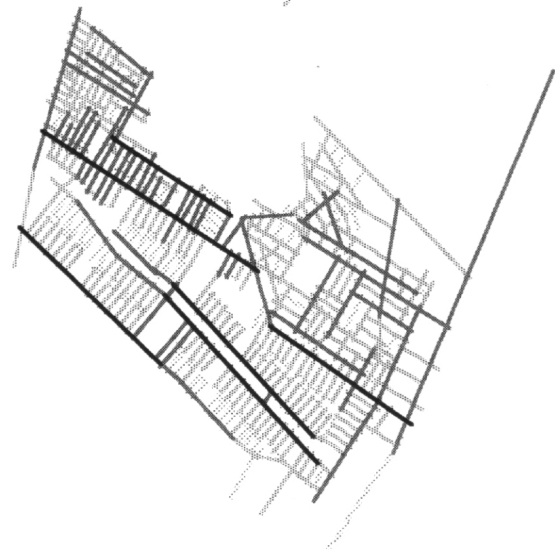


Fig. 5 Axial Map - Cidade Satilite - 'as built' - Integration 3 (Axman)



Fig. 6 Axial Map - Cidade Satilite - 'at present' - Integration 3 (Axman)

The informal roads created by the traffic of vehicles have spread throughout the whole estate thus originating a new local movement logic. Most of the newly generated movement develop in areas not designed for traffic but for open green sites, therefore contributing for the degradation of the environment and opening up an opportunity for invasive unplanned uses. It seems, therefore, sadly ironical that one of the precious - and still most valid - precepts of modernist planning - that of environmental and built health standards - has been lost by the need to overcome a planning strategy marked by a strong segregating rationale.

References

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