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**FADING EVIDENCES OF AN URBAN TRAJECTORY: A MORPHOLOGICAL
STUDY OF TWO SETTLEMENTS IN THE NORTHEASTERN HINTERLAND OF
BRAZIL**

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I. AN URBAN TRAJECTORY: FROM CATTLE RAISING SETTLEMENTS TO SERVICE CENTRES¹

The urban emergence of Caicó and Acari, the oldest urban settlements in the region of Seridó (Figure 1), located in the semi-arid expanse designated as sertão, as well as that of most towns, occurred relatively late in the historical process of occupation of the ancient captaincy of Rio Grande do Norte. Even though the first urban nucleus, Natal, appeared in 1599, it took the Portuguese settlers around two hundred years, between 1500 and 1700, to assume effective control over the region. During this long period, they had to cope with strong opposition, not only from the land's natural inhabitants, the Indians, but also from European rivals, such as the French and the Dutch, not to mention the sporadic incursions of English vessels on the coast. The penetration into the territory in search of land for cattle raising initiated slowly in the second half of the 17th century, but it took place more effectively from the beginning of the 18th century onwards, after all Indian resistance was subdued. The oldest urban nuclei of Rio Grande do Norte, aside from Natal, date from this later period. It is by then that Acari and Caicó began to take shape. If it is correct to assume, therefore, that the first urban settlements in the captaincy were conquest towns of a disputed territory, most of them owe their initial growth to cattle raising, which constitutes the main promoting factor for the occupation, however sparse, of the ancient captaincy's hinterland. This is true even in cases when their first appearance is deeply associated with military efforts of territorial take-over.



Fig.1 – Caicó and Acari in the Seridó region of Rio Grande do Norte

¹¹ Based, for the most part, on data from a doctoral thesis (Teixeira, 2002).

Caicó illustrates this. One of the prevailing theories about the town's emergence maintains that it came into existence at the end of the 17th century, in the context of the Barbarian war, a fierce Indian revolt against the Portuguese occupation of the hinterland. The Cuó fortress, built in the environs of the present-day town, is directly related to the birth of an *arraial*,² that is, a military post, founded by colonel Manuel de Sousa Forte in 1700. On July 7, 1735, this early settlement attained the urban status of a *povoação*, that is, a hamlet with no military connotation, because the Indians represented no more of a threat by then. As part of the commemorations a mass was celebrated on that day on the grounds facing the chapel devoted to *Nossa Senhora de Santana*, around which the first houses were being built. In fact, most towns in Brazil started out as a cluster of huts round an open space in front of, or surrounding a chapel. They were mostly located in the vicinities of water streams, essential for the living of any settlement.

Initiated out of military reasons, Caicó soon turned into a town of farmers, and cattle raising became its *raison d'être* since the first half of 18th century, following the progress of this activity throughout the Seridó region. An evidence of some consistent development in 18th century Caicó is the fact that the location became the seat of a parish in 1748, a privilege that only a few urban centres could attain. To celebrate the occasion, the community decided to build another church, also consecrated to *Nossa Senhora de Santana*,³ in a "more convenient place, where all the people could come". The first chapel was later consecrated to *Nossa Senhora do Rosário*, the patron saint of the slaves.⁴ Despite some evidence of progress, Caicó was still a small location with its two temples and a few rows of houses developing slowly around the parish church.

Acari does not differ essentially from Caicó, except, perhaps, for the fact that there is no historical record of military action involved in its foundation. Like other urban nuclei, Acari originated as a watering and grazing site for cattle on their way to the consuming markets on the larger coastal towns, as far as Recife and Salvador. An important water source soon became the site for a few huts, and a very small community was already established around 1720. One of the farmers living in the region, Manuel Estevão de Andrade, decided to build a small chapel on the site. It was consecrated to *Nossa Senhora da Guia* in 1738 and, like the parish church of Caicó, it had to receive the due approval of Church officials in order to receive the prerogatives of a Catholic temple.

Acari's early settlement was formed by lined-up detached dwellings located on high grounds overlooking the Acauã river, which ran at the bottom of a small valley just behind the houses. This line of buildings was to become the first street of the settlement, which stretched out on both sides of the chapel, facing northwards (figure 2a). The houses belonged mostly to farmers of the surroundings, who would use them mainly on Sundays and on other religious occasions, as well as during some profane festivities. In a rural society, these "urban" houses would remain closed most of the time. Unlike Acari, Caicó (figure 1a) developed into a roughly circular form still visible today, surrounding the parish church of Santana, and referred to by several documents dating from the beginning of the 19th century.

² The Portuguese developed a terminology for urban locations which conferred to them a distinct status according to their social, political, economical or geopolitical importance.

³ Santana is a popular name and a contraction of "Saint Anne", the mother of the Virgin Mary. We have adopted the popular term in this paper.

⁴ In the 1735 celebrations, this first chapel was consecrated to *Nossa Senhora de Santana*, the patron saint of Caicó. With the construction of the parish church begun in 1748, also consecrated to the patron saint, the old chapel was dedicated to *Nossa Senhora do Rosário*. This initial temple, whose location may not have been on the present site of the existing *Rosário* church, but probably closer to the Cuó fortress itself, was abandoned by the end of the 18th century. A new *Rosário* church, the one existing at present, was built in the first half of the 19th century. (Medeiros Filho, 1984: 141-143)

Both settlements were two poor hamlets along most of the 18th century. The title of *povoação* they both held designates, in most cases, a very small village. However, Caicó seems to have developed more consistently than Acari during that century. Its two churches, one of which the seat of a parish, constitute a first evidence. The creation of four catholic fraternities, all of them in the second half of the century, also indicated the existence of an organised, stable community life in those days. Most important of all, the title of *vila*, granted in 1766,⁵ conferred an important urban status to the settlement, since the term designated an administrative urban centre of a territory, that is, a colonial kind of municipality with jurisdiction over a certain area. Entitled *vila do Príncipe* in order to honour the Prince of the Portuguese Royal family, the settlement acquired administrative prerogatives, expressed by the institution of the *senado da câmara*. The *senado* constituted the local political power in colonial Brazil, a kind of town council whose legislative, executive and judicial jurisdiction extended over a certain territory, established at the very moment of the *vila*'s creation.⁶ Finally, the population growth of Caicó, between 1775 and 1805, confirms its urban consolidation. The available data show a population growth of 36,01%, from 3 174 to 4 317 inhabitants (Teixeira, 2002: 304).⁷ As for Acari, it had to wait until the 19th century to attain *vila* status and to have a second church built.

Once the settlement was given the title of *vila*, one of the first measures imposed by law was the construction of the town council house, the *casa de câmara e cadeia*. This building was usually two stories high, the ground floor serving as the local prison and the first floor as the council-chamber. It represented the secular dimension of power, as opposed to the chapel or church. After Brazilian Independence from Portugal, in 1822, the legal time-limit for the erection of this important building, symbol of the local self-government, was 8 years, counted from the date the settlement acquired the title. However, the eight-year deadline was seldom observed in most towns, as was the case in Caicó. The local government's seat was built in 1810-1811, over forty years after that title was awarded. That is why the councilmen of several new *vilas* used to meet in the church or in a house rented for that purpose.

Acari was, however, an exception to this rule. The title acquired in 1833 was confirmed in 1835. In 1838, only three years after the legal confirmation the building was already standing. According to João Valentino Dantas Pinajé, President of what was then the Province of Rio Grande do Norte, the building was "new, and it still does not show any sign of ruin". He also recognised that, unlike other *vilas* of the province, "only the inhabitants of Acari fulfilled the condition established in the provincial law of March 28, 1835, number 28, that confirmed its *vila* status". The president was referring precisely to the fact that most localities did not respect the 8-year period for the construction of their respective town halls. However, Acari's seat of local administration entered progressively in a state of ruin, and a new one was erected between 1878 and 1887 (Pinajé, 1838: 32-33). This building, like the one at Caicó, is still standing at the present time.

Despite the peripheral position occupied by the then province of Rio Grande do Norte in the economic panorama of Brazil, the two towns were subjected to a significant functional transformation along the 19th century following the rise of commercial activity in the region, which thrived especially towards the end of the century, at a time when the province was

⁵ The decision was confirmed or implemented only in 1788.

⁶ Six other towns in the captaincy received the same municipal rights in the second half of the 18th century. The *vilas* created by the Portuguese crown all over the colony at that time manifested a deliberate policy aimed at reaching social, economical, political and geopolitical goals.

⁷ These data should serve as a rough indication only. The population figures comprehend the territory under Caicó jurisdiction, including the town of Acari, which was administratively subordinated to the *vila do Príncipe*. Besides, we should not forget the huge difficulties involved in making a census in those days.

slowly embracing a typically capitalist economy. The impact of that evolution on the urban form of both towns – our central interest – is evidenced by the emergence of an urban legislation and of an entrepreneurial elite, as well as by the occurrence of space-related changes resulting from those factors, such as the establishment of the open air market-place, the presence of new building types and the adoption of specific designations for public spaces.

Municipal ordinances following the acquisition of a *vila* standing for Caicó in 1766 and for Acari in 1833 expressed the local authorities' intent to control the town's development. Aimed at reaching social, economic, hygienic and aesthetic goals, the ordinances encouraged commerce and regulated trade activities, the public market and so on. In formal terms, there was a strong emphasis on the aesthetic appearance of both streets and buildings, especially regarding façades, whose dimensions, number and size of openings and even colours were sometimes imposed by law. As the century advanced, straight regular grids were progressively acclaimed as signs of modernity. The ordinances tried to control the inhabitants' behaviour as well. The need to monitor the town's form and life was in tune with provincial and national growing efforts to organise their administrative apparatus, a necessary step required by a recently independent nation. Interesting examples of this kind of urban control are to be found for several towns, including Caicó and Acari, both in terms of urban form and of social behaviour. The article added to Acari ordinances on June 16, 1849, illustrates the local authorities' aesthetic concerns as regards the urban form:

“Art. 15. The owners living in this vila and povoações of the municipality are obligated to plaster and whitewash their house façades, and to make sidewalks five-span wide in front of them...within the next eleven months from the date this law is passed. They must also keep them in good state. Transgressors will pay a fine worth 5,000 réis, and in case they have no money they will be imprisoned at a rate of 1,000 réis a day” (APMA. Documentos antigos. Pasta n° 38, 1845 a 1864)

An emerging entrepreneurial elite willing to invest in both old and new building types, is another important symptom of the ongoing transformation. Well-to-do members of the community financed the restoration of old structures like churches and especially the construction of new building types such as the market-house and the slaughterhouse. In exchange, they were allowed to exploit them freely over a period of time. This is particularly true of the market-house. After an established period, say a decade, these building types returned to the public administration for its own commercial exploitation.

The new buildings would play an important urban role that had been the privileges until then of churches and *casas de câmara e cadeia*. We should bear in mind that, up to the first half of the 19th century, the church and sometimes the seat of the municipal power were the only major edifices to be found in hinterland settlements. The economic growth of the urban centres greatly explain the appearance of new building types and reveal, together with other phenomena, the secularisation process that was beginning to affect Brazilian communities. The cemetery, for example, is gradually separated from the church and located beyond the town limits. Until the 1850s, it was located underneath the temple floor itself, sometimes extending beyond its walls, and in earlier times right in front of the temple as well, in the open space that was often the site of all main public actions. Even though cattle raising was still relevant, it began to lose prestige since the mid 19th century in relation to commerce, a typically urban-based activity, a fact which was greatly stressed by the harmful effects of the 1844/45 drought on cattle raising. This general situation was, therefore, drifting both towns

farther and farther away from the cattle-related economy of the 18th century.

This complex process, only outlined in the above paragraphs, can be seen in Acari, a town that underwent a relatively prosperous period in the second half of the 19th century. Some new houses were being built in more solid materials. Other signs of prosperity were the town market-house - which was put up in the 1890's and was considered the best of the Seridó region at that time - together with the new *casa de câmara e cadeia*, constructed between 1878 and 1887. A square piazza, designated as "place of the market", was opened up in front of the market-house. This economic designation to an urban space is yet another indication of the growing importance of commerce, manifested in this and several other towns. Some new streets were formed and a new wide thoroughfare stretched from the old town core slightly to the northeast. It was probably originated from an earlier road leading to the location, and it extended in a roughly perpendicular direction to the initial street formed by the first chapel set up by the town's founder Manuel Estevão de Andrade and its adjoining houses built in the early 18th century. Along this road a new temple, one of the largest to date in the state, was built between 1857 and 1862 to become the parish church of *Nossa Senhora da Guia*, the old church being consecrated again, this time to *Nossa Senhora do Rosário*, thus following the example of Caicó. The new church to the north, the *casa de câmara e cadeia* to the west, the Acauã river to the south and the dwelling rows developing in front and in line to the east of the old chapel, demarcated Acari urban limits at the end of the 19th century. The town was described in a report of 1886 as follows:

"(...) This vila is located on the right bank of the Acauã river, on elevated site. The few existing streets are large, some of them narrow. The houses are one-story high. Its main buildings are two churches, the parish church and the one of Rosário, the cemetery, and the casa de câmara e cadeia. There are some commercial establishments" (BNRJ, 1886)

Despite some evidence of an urban growth pointed out in the previous paragraph, this description betrays a certain limitation of the town's commercial activity, unlike the picture depicted to other major urban settlements at that time. It reiterates Manoel Ferreira Nobre's assertion that Acari's trade was "in a very small scale" around 1877 (Ferreira, 1877: 151). Still, the urban transformation the town was going through attested somehow to the growing importance of commerce. The same 1886 report shows that the town survived on agriculture and cattle raising, but it also imported manufactured products like glass, tissue and iron and exported cotton, cattle, leather and cheese from and to other towns in Rio Grande do Norte and Pernambuco, and certainly from abroad through these intermediate towns, as revealed by the typically industrialized goods the town imported. According to a 1890 census, the total population within Acari's municipal jurisdiction amounted to over 9 000 inhabitants. The *vila* contained 198 buildings and 10 streets (Santa Rosa, 1987: 87). The title of *cidade* (city) it was granted in 1898 is good evidence of the urban development the location was going through. However, the new urban status was acquired only in Republican times.

The roughly circular urban nucleus of Caicó remained as such along the first half of the 19th century (figure 1a). Just beyond the town's main square lay the *casa de câmara e cadeia*, defining the town's northwest boundary. The Seridó river curled around the site defining its northern and eastern urban limits. It sometimes flooded the historical urban core of the town,

which corresponded to virtually the entire settlement in those days.⁸ The old church of *Nossa Senhora do Rosário*, lay on the west border of the town, set slightly apart from the nucleus. The south limits were defined by the blocks of houses surrounding the major public place, where the parish church was located. The town's growth towards the southwest takes place slowly over the end of the 19th century and especially along the first decades of the following one. The city expansion beyond the Seridó river to the north takes place only in the 20th century, just like Acari's expansion southwards was limited to the Acauã river banks for a long time. In Caicó, the Seridó Avenue, a major artery stretching from the old centre around the parish church to the southwest, expanded during the first two decades of the 20th century as a straight, large road. It would later become one of the major avenues in the town and a witness of its expansion southwards.

Around the 1850's, Caicó had already an open air market-place and probably a market-house. The open space where the market was held was also named after this commercial activity. Some documents mention a market-house, maybe a simple structure, by the 1880's, but its location is unknown. The expansion of the city along Seridó Avenue explains why the new market, built in more permanent building materials and of considerable size for those days, was situated at the Southwest extremity of this avenue, away from the parish church of Santana. The presence of such a building reinforced the town expansion along this axis. In 1868, Caicó is awarded the title *cidade* (city). After changing names twice, it is finally nominated *cidade de Caicó*, in 1890, remaining as such up to this day.

The urban fabric of both "cities"⁹ expanded progressively in the form of regular grids. The "straight line paradigm", partly justified by an economic rationale concerning land use, consolidated as a symbol of modernisation. Ordinances of aesthetical nature concerning the adornment of façades in main streets and the emphasis on the chessboard-like street grid, typical of the 19th century, became an obsession during the Republican period. Local ordinances of Acari, in 1899, state very clearly the need to straighten the streets and squares and to adopt the orthogonal grid (APMA, 1899). The same ordinances also show aesthetic concerns as regards the walls facing major arteries. In fact, the local ordinances of the 19th century contributed greatly, in our view, to imparting a certain aesthetic and formal look to many present-day historical centres of Rio Grande do Norte towns.

The commercial activity of both towns progressed in the first half of the 20th century thanks greatly to the cotton industry in the Seridó region. The economic prosperity seems to be especially evident in Caicó, and, to some degree, in Acari too from the 1940's on. The cotton boom in the region and its urban consequences is a well-known fact stated by several scholars and there is no need for further elaborations on that. It suffices to transcribe some extracts from a study by one of them, Antonio Soares, who described the municipality and the town of Caicó around 1930:

"(...) Cattle raising and agriculture are the major sources of wealth of the municipality, which holds hundreds of farms and vast areas of cultivated lands. Cotton is the main crop, of best quality and worldwide fame... commerce in the municipality is considerable, because of the great increase of this and other products, like the sales

⁸ That is why local councilmen, asking for urban improvements to the provincial government in 1851, mentioned the need to build a dam to prevent this from happening. They said the floods could ruin the parish church and the houses of some streets.

⁹ This article maintains, however, the use of the term "town" for both of them. Essentially, however, the word city is probably closer to the term in Portuguese – *cidade* – at least from a legal and administrative standpoint.

of cattle...an agrarian Bank functions in the town, founded on May 1st 1929...the industry is represented by mills that manufacture rapaduras and distil aguardente. Farms also make cheese – the famous Seridó cheese...Caicó is one of the most important towns of the State and the biggest one in the Seridó zone; it has nice buildings, a thriving trade and electric-powered illumination. In 1906 the town had about 400 buildings, an amount that has almost doubled to date with the construction of many others, some of which in modern style. Among the public ones stand out the Intendência, the Public Market, the Prison (old system) Senador Guerra school and Seridó hospital (a modern construction)... the parish church of Caicó is one of the greatest dioceses...there is also a chapel in the town, consecrated to Nossa Senhora do Rosário, which used to be the parish church...” (Soares, 1988: 71,72)

The author mentions other religious and non-religious associations, modern buildings and services, municipality finances, a main road linking the town to the capital, Natal, and an aviation landing field, built in 1928 and located two kilometres away from the urban settlement. This description, and others that could be added, dating from the first half of the 20th century, do not hide some amazement with the town development, which is due in great part to the growing importance of commerce related to the cotton industry, although cattle raising continued to have its place then and in the following decades. Something similar can be said of Acari, albeit in a minor scale. By 1930, for example, this town was not in the same pace of development as its neighbouring Caicó, as one can gather from the same author's description of it:

“(...) The town, located on the right banks of the Acauã river, is illuminated by electrical power. It has regular buildings, most of which in old styles. There are, however, some more recent constructions in which certain rules of modern architecture have been observed. A substantial amount of houses remain closed during workdays of the week, because their respective owners, who are more or less prosperous people, prefer to live with their families in the farms where they work. They come to town only on Sundays and on festivity occasions to accomplish their religious obligations and to visit friends. Among the most important buildings can be pointed out Thomaz de Araujo school, the town hall (Intendência) and the parish church, the second largest temple in Natal diocese” (Soares, 1988: 5)

Even though Antonio Soares mentions other improvements other than these, like schools, a post office, roads into and out of town, a bridge spanning the Acauã river, an airfield and other signs of modernity such as the telegraph, the general impression is that of an urban centre which had not yet flourished. The reference to the prevailing old styles of its architecture and habits of the colonial times like the custom of living in the countryside and coming to town only on special occasions confirms such an impression. In fact, by 1930, Acari maintained roughly the same urban limits of the end of 19th century. However, it grew considerably since then. In 1940, the town's urban population amounted to 1,291 inhabitants (Câmara, 1941-1942: 10). In 1970, it reached 5,292 inhabitants (IBGE, 1971: 24), that is, a significant increase of 409,91 %. Another symptom of the town growth since then is revealed in the mayor's proposition to the town council, in 1949, to expropriate suburban lands

belonging to the patron saint of *Nossa Senhora da Guia* for the construction of dwellings and a slaughterhouse. The mayor added that “in the urban zone there is no more vacant places to build new houses and many people are willing to build even if it is in the town outskirts”. The town council authorised the acquisition of the land by unanimity (CMA, 1948-1952: 35v).

In any case, it is certain that Acari did not attain the same growth rates of Caicó, certainly because its commercial activity was weaker. Caicó held an urban population of 3,968 inhabitants in 1940 (Câmara, 1941-1942: 88), that is, three times that of Acari then. It grew at a staggering pace of 619,8 % in only 30 years, reaching 24,594 inhabitants in 1970 (IBGE, 1971: 25), four and a half times that of Acari for the same year, despite the urban population growth of 409,91 % of the latter. Another point of comparison lies in the urban space itself. By 1940, Acari, made up of 34 streets and 304 buildings in its urban zone, did not have a Bank establishment for instance, while Caicó had 40 streets, ten of which arborised. In that same year Caicó reunited 1,090 buildings (Câmara, 1941-1942: 12-13, 90-92), while Acari had to wait until 1951 to reach around 600 constructions (CMA, 1948-1952: 71). Despite visible differences, it is certain that both towns were being transformed, and the economic activities of both greatly explain such changes. Certainly, the peasants’ expulsion from the countryside is one of the causes for this process. The growth of both towns after the mid 20th century reflected, in broad terms, the rapid urbanisation process that occurred all over Brazil since then.

In the early 20th century, the Seridó micro-region experienced a period of great economic prosperity due to a rising demand for cotton – whose crop adapted perfectly to its climate and soil conditions – by national and international markets. This period turns out to be the last episode of a strong rural-based economy run by a deeply rural-rooted society. After the collapse of the cotton cycle around the 1960’s, and especially following the national urbanisation process of the 1970’s, those towns’ rapid growth continued. The urban areas of both towns have also increased much beyond their original limits, especially Caicó. However, this urban expansion is particularly linked to the development of the services sector, a third phase, so to say, in the towns’ functional evolution since the old cattle days as services have tended to develop more than commerce over the last decades. These changes brought about, once more, an important impact on the town form and the remains of its past. Traces of both architectural and urban previous forms have disappeared and many existing vestiges are being continuously erased from the scenery or submitted to grotesque mutilations, especially the older buildings, which date from the 19th and early 20th centuries.

II. A FADING HERITAGE: EFFECTS OF TERCIARY ACTIVITY ON BUILDING CONSERVATION

Empirical observations of Caicó, Acari and other towns in Seridó showed that living evidences of the trajectory described above, which had survived well into the 1970s, started to disappear from then on. This motivated an inventory (figure 2) developed along the 1990s, (Trigueiro, 1995-2000)¹⁰ as well as a series of spatial modelling that aimed to shed light on the effects of the urban expansion over the architectural heritage.

¹⁰ The inventory results are being gradually displayed in the web – www.seol.com.br/bdc

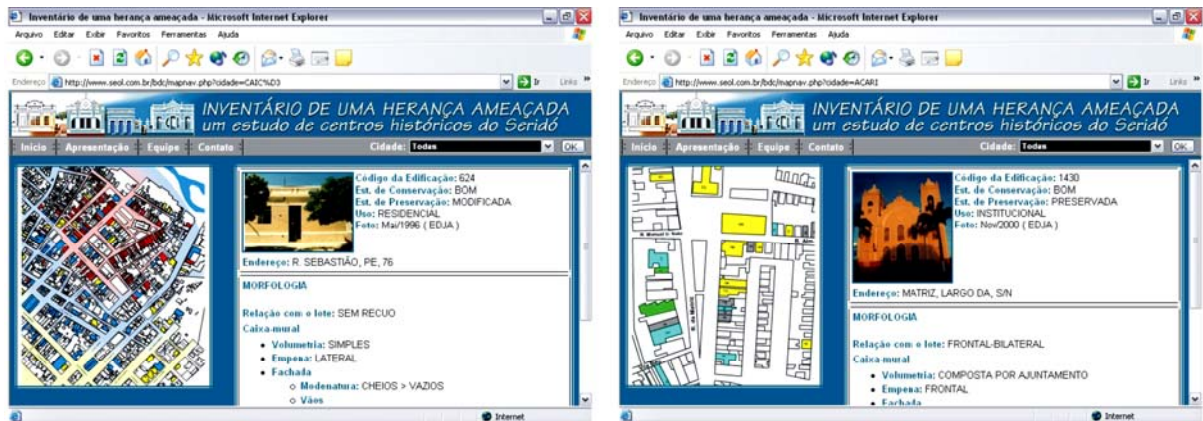


Fig. 2 : Caicó (left) and Acari (right) as two examples of the inventory on towns of Seridó, displayed in the web.

Space syntax analysis was applied to simulate successive stages of each town's urban growth and to ascertain whether positive correlations between spatial configuration properties and building conservation were to be found. The central logic underlying the method is based on the assumption that "spatial configuration" is "a set of interdependent relations in which each is determined by its relation to all the others (...); and in the proposition that "(...) the fundamental correlate of the spatial configuration is movement" (Hillier, 1996, 35-152). To these it may be added that different movement potentials resulting from the spatial configuration affects the way space is used differently and, therefore, the construction, transformation and destruction of buildings as they acquire (and lose) functions.

"(...) the structure of the grid considered purely as a spatial configuration, is itself the most powerful determinant of urban movement, (...). Because this relation is fundamental and lawful, it has already been a powerful force in shaping our historically evolved cities, by its effect on land-use patterns, building densities and the part-whole structure of the city."(Hillier, 1996: 152).

Four analytical stages are proposed for the study of settlement layouts: representation, quantification, observation and correlation (Hanson, 1992: 149). These stages help understand *the laws from society to urban form* or how society gives spatial form to different types of social relations as well as *the laws of urban form to society* or how the urban form exerts certain effects back on society (Hillier, 1989: 6). Since people and vehicles tend to move in lines, (Hillier and Hanson, 1984) propose linear representation (axial representation or axial maps) to investigate movement patterns as well as a whole range of factors associated with movement.

The extent to which the laws of urban form to society responds to the laws of society to urban form may be measured by correlating configuration data and available (known or observable) variables such as land use, land value, movement patterns, etc.

Linear representation is obtained by representing each street or street segment by the least number of the longest interconnecting straight lines that may be inserted within the open space between buildings. Computer applications, specifically designed for syntactic analysis, number those lines and build a matrix of connections that takes into account all other connections from each of the lines within a certain street structure under investigation regardless of its dimension (a neighbourhood, a town, a metropolitan area). This matrix can

be calculated so that the relative position of each segment in relation to all other in the complex can be quantified. These measures, referred to as *access values* or *integration values* are then translated into graphic and numerical scales. Complete information about space syntactic analysis is extensively exposed in the works referred here as well as in a large number of academic papers.

In this study, movement potential and its effect on land-use patterns and building conservation were quantified as follows: (1) each street or open space in a defined area surrounding the old town centres of Caicó and Acarí was represented by the least number of interconnecting straight lines; (2) computer applications¹¹ specifically designed for syntactic analysis were used to number those lines, build a matrix of connectivity and calculate “integration values”, that quantify the potential movement of each line in relation to all others in the street grid object of study; (3) building remains dating from the mid-twentieth century and before, that had been recorded through field observation and classified according to time of construction, were represented in the maps (Figure 1); and (4) each of the above mentioned procedures was reworked over plan representations of the towns at three successive stages of their development – roughly the nineteenth century, the early and the mid twentieth century.

Insert figure 1 around here, please

After calculating the integration values, the computer application applied here translated these values, automatically, into a graphic scale of integration values ranging from red (higher integration) through yellow, ochre, green and blue to dark blue (higher segregation).

Figure 3 (a to c) displays a diachronic linear model of Caicó (mid-19th century, c.1920, and c.1980) over the present street grid of the town centre, together with recorded remains of buildings erected before the 70s. These were classified according to their stylistic affiliations – colonial, eclectic and modernist – that inform about time of construction – c. 19th to early 20th century, 20s to 40s, 50s to 70s, respectively. Similar procedures are displayed in figure 4 for Acari.

The lines, at each period, coincides roughly with the presence of building remains of an equivalent epoch. It is argued here that the importance of this built ensemble goes far beyond the individual historic value of the buildings as each case is a landmark of the urban occupation, informs about the historically conditioned formation and transformation dynamics of the town where it is situated, besides serving as living evidences of bibliographic and iconographic records.

¹¹ Axman, developed by researchers of University College London.

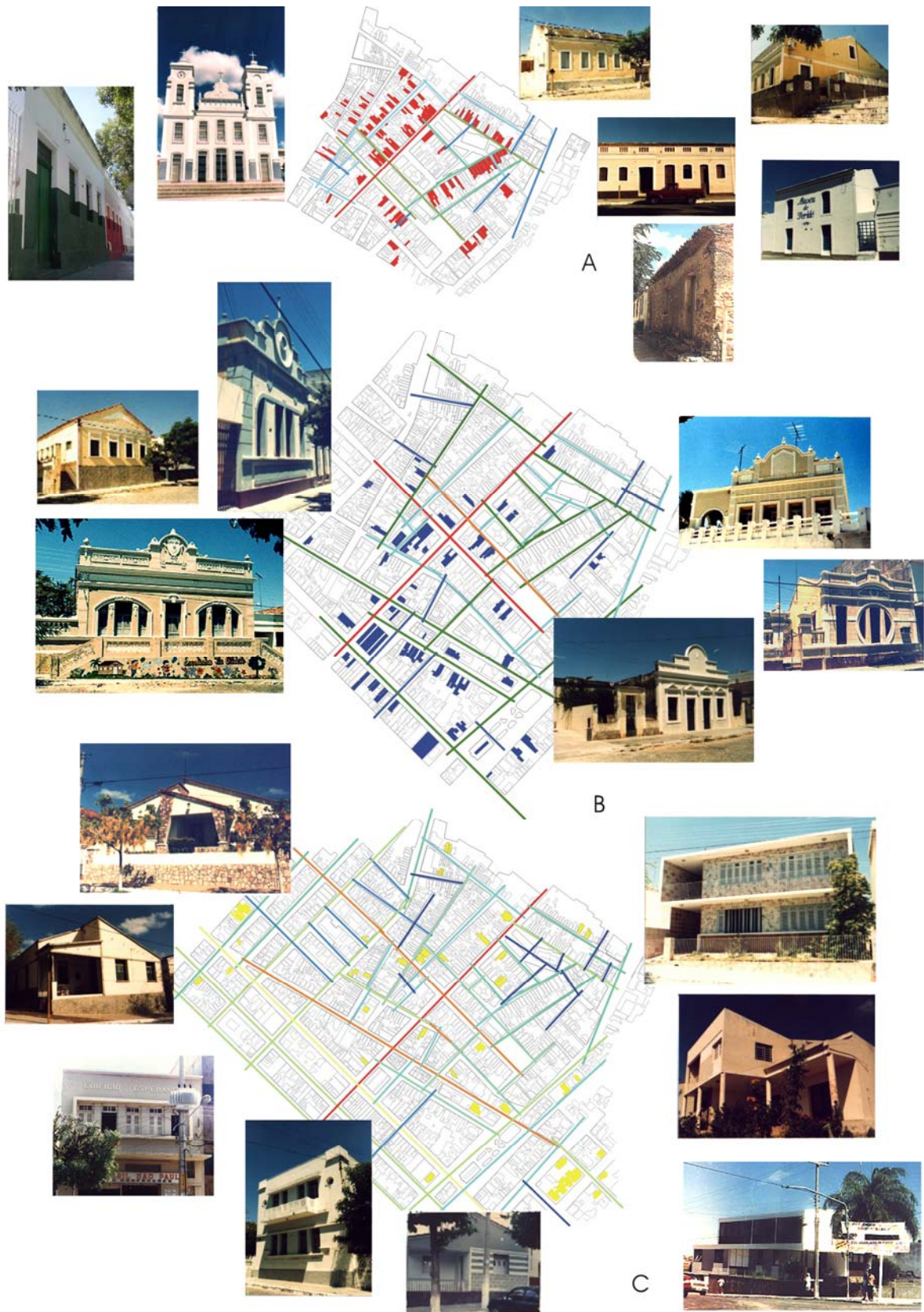


Fig.3. Diachronic linear model of Caicó over the present street grid of the town centre: a) mid-19th century. Colonial buildings; b) 1920. Eclectic buildings; c) 1980. Modern buildings.

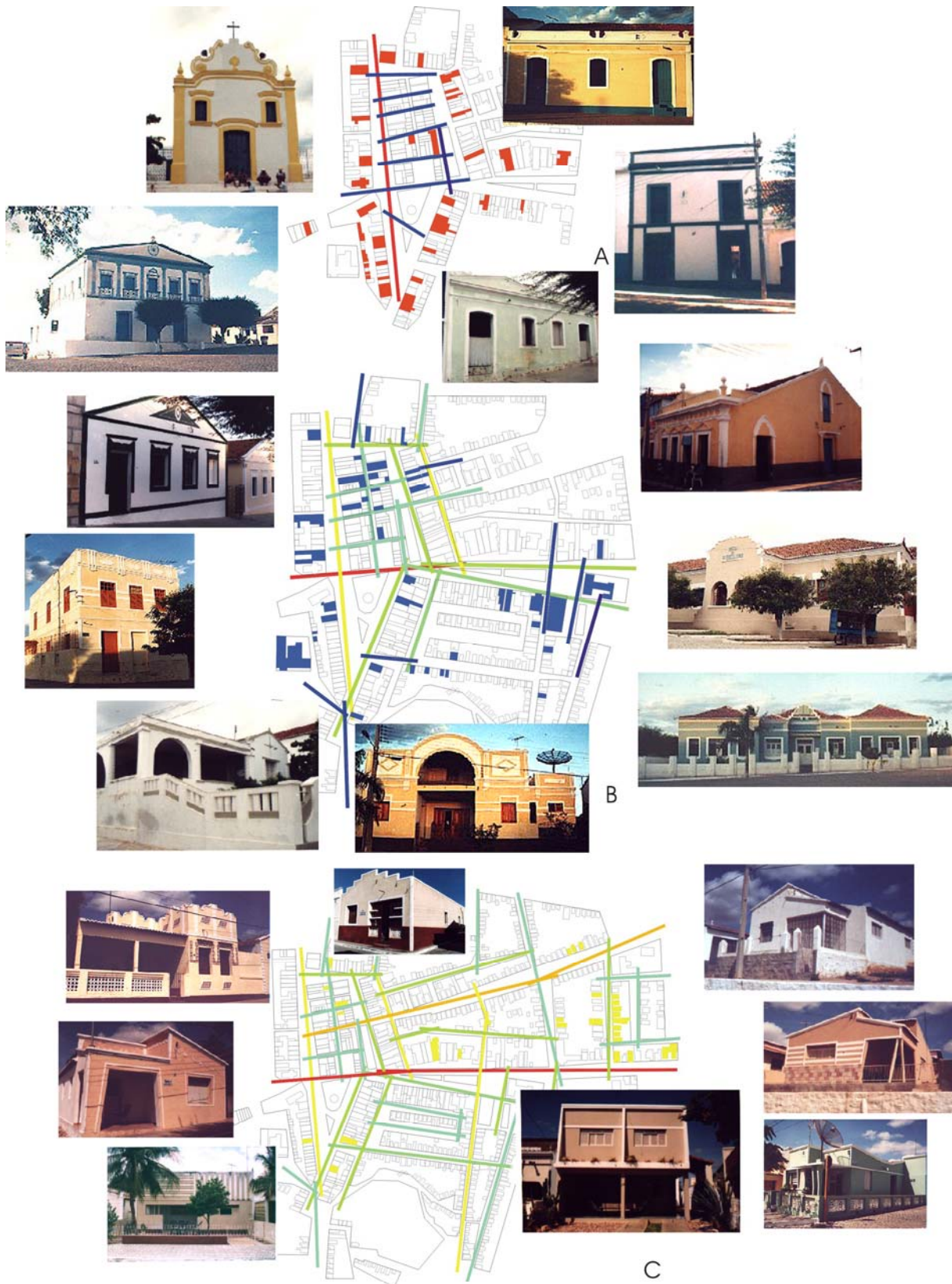


Fig.4. Diachronic linear model of Acari over the present street grid of the town centre: a) mid-19th century. Colonial buildings; b)1920. Eclectic buildings; c)1980. Modern buildings.

The effect of the spatial configuration over land use is represented in the modelling of

Caicó in the late 1990s, presented in figure 5, which shows that a dense cluster of tertiary activities tends to concentrate along the most integrated lines. The relationship between accessibility and the presence of activities that benefit from movement (i.e. retail) is a well explored theme in a range of studies whose scope goes far beyond that of form-use investigations. In the present cases it seems clear that the movement potential engineered by the spatial structure of the street grid has contributed towards the concentration of tertiary activities in an area that had been a residential neighbourhood from the 1920s to the 1940s.

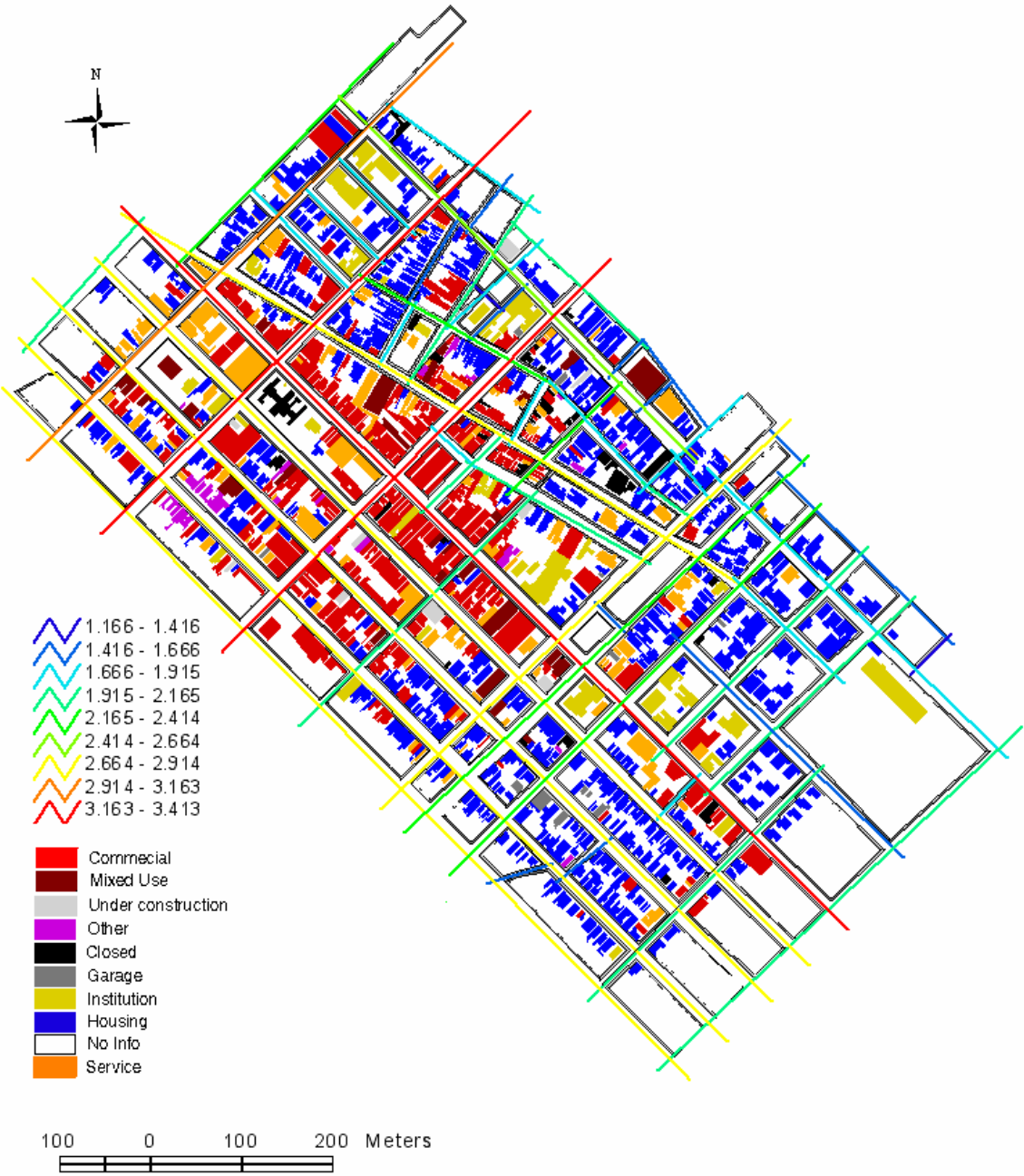


Fig. 5 – Land use and accessibility in the town centre of Caicó in the 1990s. Tertiary activities tend to concentrate along most integrated lines.

The impact of the change in land use over the architectural heritage is illustrated in figure 6, which shows that strongly modified buildings tend to accommodate commercial activities, whereas well to fairly preserved buildings are almost always those used as public or private institutions, and, less frequently, as residences. The argument is illustrated here by the example of Caicó, however, this situation unfolds through various hinterland towns of varying sizes as much as it does in larger cities, as verified in a number of related studies (Trigueiro e Medeiros, 2003; Medeiros, V. A. S. 2002; Trigueiro, E. et al. 2001).



Fig.6. The impact of tertiary activities on the architectural heritage of Caicó.

In those studies it was seen that as soon as a thoroughfare (or cluster of thoroughfares) became highly accessible, it tended to attract institutional edifices, upper class residences, and later commercial buildings; every time the grid expanded or was transformed, and a new set of streets became highly accessible, previous well-integrated thoroughfares tended to stagnate as most new constructions concentrated in the new integration nucleus whereas buildings in streets at the fringe of that new nucleus – usually benefiting from the movement to and from it – tended to suffer disfiguring conversions as a result of morphological adaptations to new uses, which were often that of small retail and service outlets.

As has already been explained, in figures 3 and 4 the street grids of Caicó and Acari were modelled to account for the scale of accessibility in a diachronic perspective. It was seen that the set of most integrated axes moved gradually around the town. In the axial modelling of Caicó at its present stage displayed in figure 7, however, it can be seen that the integration nucleus take up a considerable chunk of the street grid. This means that after the huge urban expansion of the last two decades the whole of the town that had existed until the mid-20th century – where all existing architectural heritage up to the modernist era is situated – has now become a grid of highly accessible streets as compared to the more or less segregated surroundings and enclaves of the periphery. This physical property, as has been demonstrated in previous studies benefits movement-related uses, particularly that of retail and small services, which, have proved lethal for the architectural integrity in Brazilian towns.

These findings are, therefore, an alarming demonstration of a process in which urban settlements whose *raison d'être* was to give support to a rural-based society, lost its centuries-long character without acquiring mechanisms capable of conciliating their new urban roles and the conservation of their built heritage.

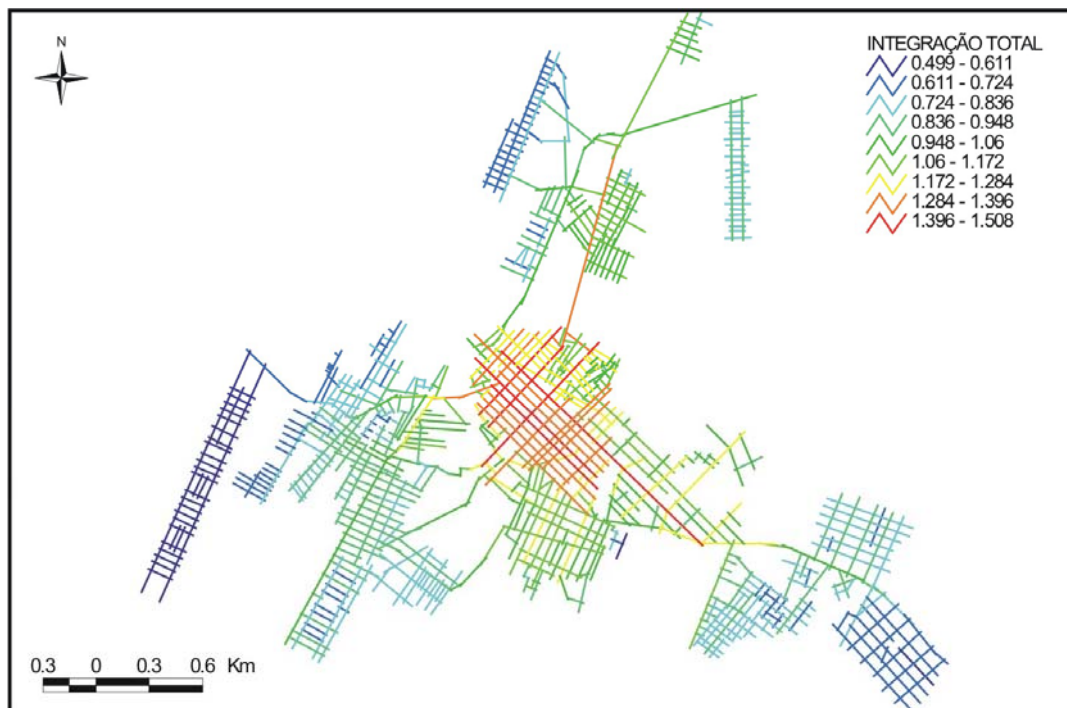


Fig. 7. Axial map of Caicó at the present time.

As has been seen, until well into the 20th century in the towns of Sertão, most dwellings were second residences of local farmers, being inhabited during certain social and religious festivities and remaining closed otherwise. Towns were then community locci in which the notion of intense co-presence, was a synonym of urbanity that counter-balanced, perhaps, the rusticity and isolation of the country life. Movement potential was thus an asset to be valued as civility and demanded architectural integrity as its natural complement. Once that polarity was lost the links between integration and architectural integrity were also lost, and movement potential become the sole correlate of commercial possibility.

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