Recife is located in the Brazilian Northeast Region, in the state of Pernambuco. The Metropolitan Region of Recife (RMR) is the largest urban agglomeration in the North-Northeast, the fifth largest in Brazil, with a population of 3.9 million inhabitants (IBGE Estimative 2015), and the third metropolis of the country in housing density, surpassed only by São Paulo and Rio de Janeiro, and fourth largest urban population in Brazil network.

Recife has the highest GDP per capita in the Brazilian North-Northeast and is the political, financial, commercial, educational and cultural center of Pernambuco. Concentrating 65% of GDP Pernambuco, its area of influence covers the states of Pernambuco, Alagoas, Sergipe, Paraíba, part of Rio Grande do Norte, the northeastern part of Bahia and the interior of Piauí and Maranhão.

Has a large international airport (Guararapes / Gilberto Freyre), two ports (Port of Suape and Recife Port), universities, museums, hospitals, industrial centers, commercial centers and resorts and hotels. The Metropolitan Area spans 14 municipalities: Jaboatão Guararapes, Olinda, Paulista, Igarassu, Abreu e Lima, Camaragibe, Cabo de Santo Agostinho, São Lourenço da Mata, Araújo da Mata, Itamaracá, Ipojuca, Moreno, Itapissuma and Recife. The city of Recife was elected by research commissioned by MasterCardWorldwide as one of 65 cities with more developed economies of the emerging markets in the world. Only five Brazilian cities made the list, having received Recife fourth, after São Paulo, Rio de Janeiro and Brasilia and in front of Curitiba. According to British consultancy PricewaterhouseCoopers, Recife will be one of the 100 richest cities in the world in 2020. However, like other Brazilian cities, economic growth is not directly reflected in urban infrastructure. Recife is a city that suffers from uncontrolled growth, social inequality and a chaotic urban mobility due to the high number of private cars, a result of increased purchasing power of the population and a public transport that did not follow the growth of the population.
Land Use

Recife is the central core of a complex metropolis and its historical development, combined with the natural conditions of the site where it has developed, points out aspects that clearly translate its identity: diversity and contrasts. The landscape of the coastal plain, surrounded by hills and cut by a network of numerous waterways, is marked by the different expressions in the morphology of its built environment. It houses a population of 1.6 million inhabitants and receives daily a considerable portion of the 3.7 million inhabitants of the metropolitan area, who commute due to its attractiveness in terms of service provision and job opportunities.

The serious social contrasts are reflected in the disparities of the urban network configuration in land use patterns, in the form and quality of the buildings, and in the spatial distribution of the supply of urban infrastructure and services. The last two decades have shown that the speed of change and the deterioration of social and managerial conflicts in the daily challenge of urban management are increasing.

The increase of Floor Area Ratios (FAR) in the urban regulations introduced in the 1990s resulted in one of the highest building potentials among Brazilian cities and reflected visible changes in the city's morphology and in its patterns of constructive density. Technological advances and the present state of affairs in the real estate market have contributed to the improvement of building standards and have changed the skyline in the urban landscape of Recife – albeit in a proportionally concentrated way, in limited areas, when compared to the entire urbanized area.

On the other hand, the intense urbanization process has been: (i) occupying environmentally fragile areas, such as mangroves, which causes ecological imbalance and the gradual increase of pollution of natural resources; (ii) compromising the rich historical and architectural cultural heritage of the city. Consequently, this urbanization process has negatively reflected in the metropolitan populations' quality of living standards.

Moreover, the form of isolation that has guided the architectural design of new ventures is fomenting an opposition between public and private space. Supported by a culture of panic, fostered by the proliferation of urban violence, the predominant architectural patterns in major real estate projects have promoted high walls and expanded physical and visual barriers between the lot and the street. This segregation highlights a cultural dimension of the denial of public space, which is reflected in the history of low-impact interventions within the public spaces and fragile urban control actions carried out by the government.

The economic dynamism of recent years has brought positive changes in income patterns and in the consumption capacity of the population. Nevertheless, it has also boasted a hulking increase in value of urban land, which aggravates the affordable housing shortage problems. Moreover, it has expanded the demand for better traffic conditions in the city, due to a large growth of the automobile fleet. The severe mobility crisis experienced in recent years has exposed the impossibility of maintaining the current modal patterns, and calls for public transport priority. In this sense, the relationship between urban mobility and real estate dynamics has intensified, posing new challenges for city management and for the regulation of land use and zoning.

Under the “Estatuto da Cidade”, the Master Plan, Law #17.511/2008, in its Art 216, calls for a regular revision of the plan every ten years. Moreover, part of the legal text is the acknowledgement that a change initiative is possible “whenever significant changes in urban evolution recommend it.” The current critical combination of accelerated real estate dynamics and mobility crisis represent these significant changes which justify the decision to initiate a change process before the completion of the tenth anniversary of the Master Plan’s publication.

The mobility crisis situation, although not the core theme of land use and zoning, evokes a more radical transformation on the city, on its standards for city planning, on the offer and spatial distribution of infrastructure and services, as well as on its social and economic dynamics. The frequent conflicts and heated debates about the city’s identity, its memory and its future, headed by large enterprises, have exposed a strong social unrest and have highlighted the need for an appropriate instrument for mediation, as well as the need for consideration towards alternative possibilities for growth, in processing and preserving the multiple facets of the city. A regulatory revision does not change this broader dimension of management and urban planning. On the other hand, it can support a readjustment in form and means to ensure more diverse expressions of landscape, morphology and urban atmosphere, without having any model surpass the other, but so that it is guided by the values of different identities and features for a city shaped by distinct actors and values.

The Master Plan of Recife (PD Recife), Municipal Law #17.511, was passed in 2008. Since then, the instruments provided in this Act were either regulated in scattered legislation, or were not regulated at all. Therefore, it is necessary to regulate and / or to update the following instruments:

a) Master Plan of Recife (Plano Diretor do Recife, Law #17.511 / 2008) - The current Master Plan, especially the chapter on urban zoning, is out-dated in face of the recent evolution and the dynamics of the city; a revision is necessary in order to reflect the
transformations that have taken place, and at the same time, to meet the requirements of the environmental, historical and cultural heritage protection of the city.

b) Land Subdivision Law (Lei de Parcelamento do Solo, Law #16.286 / 1997) - The Subdivision Law predates the current Master Plan, and therefore needs to be revised and updated in order to be harmonized with the instruments to be revised and regulated in this project.

c) Land Use and Zoning Law (LUOS - Lei de Ocupação e Uso do Solo– Law #16.176/1996) - The current law enacted in 1996 predates the development of the Master Plan and establishes Floor Area Ratios which are incompatible with a sustainable city model. This anachronistic situation has brought many difficulties to urban management and city planning. In addition, the city planning legislation relating to land use and zoning is scattered and fragmented, which hinders its applicability by the Public Administration and its understanding by professionals and the general population. In this sense, it is essential to consider, in the revision of the law, the need for protection of the environmentally fragile sites of ecosystems and the city’s precious collection of architectural heritage.

d) Onerous Grant of Development Rights (ODIR - Outorga Onerosa do Direito de Construir) - Although expressed in the Master Plan, the Onerous Grant of Development Rights (ODIR), which allows the city government to balance out the value of urban land, still needs regulation for its application.

e) Transfer of Development Rights (TDC - Transferência do Direito de Construir) - The TDC instrument is extremely valuable for the management and planning of the city, and for the protection of the environmental and historical-cultural heritage. Although it was provided for in the Master Plan of Recife, the TDC has never been regulated. Its regulations will expand the range of urban management tools for Public Administration.

f) Compulsory Land Subdivision, Building or Land Use (PEUC – Parcelamento, Edificação e Utilização Compulsórios) and Progressive Urban Property Tax (IPTU-P – Imposto Predial e Territorial Urbano Progressivo) - These instruments, provided in the Master Plan of Recife (2008), have not been regulated up to this date. This allows city spaces to remain submitted to idleness (or underuse) generating high expenses to the local government and enabling owners to profit from real estate speculation - with negative consequences for the public management, and also the citizens.

As a result, it is necessary to revise, update, systematize, and/or regulate the instruments established in the Master Plan, as well as the Master Plan itself. Therefore, the ICPS, in conjunction with the SEPLAN, conceived the Spatial Plan of Recife (POT-Recife).

The POT-Recife consists of a technical study and Draft Bills, aiming to revise, update, and complement urban legislation which refers to the application of the relevant planning and regulatory instruments of the Master Plan, and fundamental to the democratic management of the city.

This impact on land use planning, especially on zoning and parameters, creates the opportunity to support the standards of subdivision and land use as an operating instrument closer to the principles and guidelines of the Master Plan passed in 2008. It is important that the new regulations bring emphasis on a proactive and integrated approach to the exercise of planning, avoiding merely qualifying standard norms of the use and occupation of the land. The present moment points to the need for a reflection on sustainability, which finds in urban density a key element to promote a compact city – but not necessarily vertically – balanced on the provision of public open spaces and the diverse mix of uses and activities, as well as the morphological patterns of its constructions.

Well over four years have passed since the deadline for the revision and regulation of the complementary instruments of the Master Plan; yet, the negative effects have worsened and have been put on the priority agenda as the initiative to overcome inertia. However, drafting of new rules cannot be guided by haste, and the complexity of the problems and challenges demands a technically consistent and socially legitimate construction process. The technical consistency must be focused initially on the search for a more coherent correlation between principles and guidelines and the parameters and procedures regarding subdivision and land use and occupation. There may not be consensus, but there is strong evidence that the defense of diversity in urban landscape and morphology, expressed in the Master Plan, does not resonate well with the generalized way some parameters apply to wide expanses of urbanized area, ignoring singularities and favouring the reproduction of uniform urbanization patterns. Another challenge is the technical consistency regarding the establishment of references and procedures for assessing the support capacity of urban infrastructure. This concept is also stated in the Master Plan, and finds very limited support in the establishment of conditions for impacting enterprises, and/or in the analysis of activities which potentially generate nuisance to the neighbourhood.
Transportation

The Integrated Structural System (SEI) is a public transportation network, comprising bus lines and the metro, covers the whole Metropolitan Region of Recife. It contains both radial and ring lines. At the intersections of these axes, there are terminals for connections allowing the passengers to change lines without paying a second fare.

The Recife Metro forms part of the Integrated Structural System (SEI), comprised by two lines, powered by electrified system supplied by overhanging cables. Both lines are on the ground, using former freight railways.

Work began on the Recife metro, funded by the World Bank, in 1983. The original project stretching 20.5 km from the city centre to the Western Zone of the Metropolitan Region of Recife, with 17 stations, spaced, on average, 1.2 km apart, was constructed along the line of the old Federal Railway, which transported cargo and passengers (See Map 1). An initial demand of 300,000 passengers per day was envisaged (Castelo Branco, 2004), and it was to be constructed in four stages. All four stages were finally completed in 1987.

The system currently transports an average of 180,000 passengers per day, or around 4,000,000 per month, and operates between 5 am and 11 pm seven days a week, with an interval of 5 and 7.5 minutes between trains at peak and off-peak times respectively.

The metro runs through densely-occupied urban space that has been put to a relatively wide variety of uses, including old formal residential areas, relatively densely-populated informal settlements, commercial sub-centers, underused warehouse and storage areas, and industrial areas that have fallen into disuse. In the residential areas, the typical low-income housing reflects the socio-economic conditions of the population. Productive land use is mostly restricted to small-scale commerce and services, concentrated along the main transport axes. The typical problems of these areas include the depopulation of the central areas and idleness in the larger areas, sub-standard infrastructure, particularly sanitation, a large amount of irregular occupation, lack of infrastructure and poor environmental quality.

On the basis of census data collected in the year 2000, it is estimated that, within the area of around 9 km² covered by a 500m-wide strip on either side of the railway track, there are around 25,400 permanent housing units, with a total population of around 115,000, and an average population density of 110 inhabitants per hectare. The socio-economic conditions in the area have been measured in terms of various factors. On average, heads of households earn the equivalent of 3.22 times the Brazilian minimum wage and have around 6.35 years of schooling. In the city of Recife as a whole, the average monthly income among individuals who have a regular income is equivalent to 5.37 times the minimum wage. The average Human Development Index (HDI) of the area along the metro is 0.744, lower than that of Recife as a whole (0.797). Both of these figures are considered, according to international parameters, to indicate a medium level of development.

Economy

Percentage of income spent in transportation

The Brazilian monthly minimum wage is BRL 800 (approximately USD 200). In Recife, bus fee is currently set at BRL 2.80 (USD 1.20), while subway fee is BRL 1.60 (USD 0.40).
In Brazil, however, the commuting fee is provided to workers within a social benefit program called “Vale Transporte” (something like Transportation Voucher), where the cost for the monthly commuting fee is shared with the employer. Currently, the worker has up to 6% of his/her salary deducted directly from the salary. The employer pays the rest directly to the transportation authority.

In Recife, commuting for elementary and secondary students of public schools within the Recife Metropolitan Area is entirely paid by the state government.

**Average commuting time**

According to the latest census (2010), average commuting time within Recife Metropolitan Area is approximately 122 minutes. This is equivalent to Curitiba, as a reference, which puts both cities in 4th position on the longest commuting trips in Brazil.

**National framework affecting TOD**

Although the new National Policy on Urban Mobility has established a consistent environment for transportation planning focusing on non-motorized transportation (pedestrians and cyclists), the concept of Transit Oriented Development is yet to be introduced. National regulations cover mostly operation and financing of transportation systems. As municipalities are in charge of urban planning, TOD is local matter in Brazil.

**TOD Vision for Recife**

TOD vision for Recife aims the Recife 500 Years Plan, as it develops a city level strategy that shall overcome city limits to the metropolis, defining a more integrated land use pattern to mass transit infrastructure, changing Recife to a more sustainable, resilient, compact, walkable, diverse, vibrant city.

**Objectives**

The creation of the Recife 500 Years Plan and the Recife Agency for Innovation and Strategy (ARIES) provide the basis for a change in the approach for long term planning in Recife. ARIES is being conceived from the logic of a governance model that allows for the empowerment of civil society organizations in the process of proposing, monitoring, influencing and even executing public policies whose implementation and impact are critical for the sustainability of the city, and lasts for a time horizon which trespasses local government mandates. ARIES focuses on confronting two issues which are in the roots of the problem of low effectiveness of public policies: (i) lack of a city long-term project; and (ii) coordination crisis.
Recife has a tradition of urban planning. Although high-level efforts can be noted throughout the city’s history, the city that resulted from this process does not have a project unit, nor was capable of addressing central and key issues for the successful development of the city. In order to reverse this situation, ARIES is leading the development of a city strategy to Recife, having as a major milestone the year when the city will celebrate 500 years, which is 2037. The project Recife 500 Years Plan is a partnership between the municipal government and civil society.

The concept involves providing Recife with a strategy to address critical issues of the city, built around convergence points and projects, which contributes to reaching the city that “recifenses” want to have in 2037. The strategy is being anchored in a viable and comprehensive implementation plan composed of priority projects that can be quantified, qualified and monitored by society. The plan is being built across five areas: (i) Inclusion and Human Development, (ii) Economic Development, (iii) Urban Space and Mobility, (iv) Environmental Sustainability and (v) Public Services. Although the process of listening the population through public hearings, focal groups, meetings with representatives of various sectors, etc. is still underway, the Recife 500 Years already points out the central issues and challenges for the city. Some of the strategic areas for positively transforming the urban experience and the quality of life in Recife involve:

- Social inclusion through the transformation of public education;
- Generating economic opportunities through expanding the complexity of the local economy;
- Improving mobility through significant interventions in public spaces which prioritizes pedestrians;
- Promoting environmental sustainability though the recovery of the Capibaribe River, its banks and its network of channels.

The aim is that Recife will emerge as a regional center in Latin America, and will be recognised for its excellence in modern services, quality of life, and sustainability actions. Finally, there is the goal of designing a mixed governance model that amplifies and improves the efficiency of listening to the aims of the population and translating it to public policies.

One of the biggest obstacles for a city to reach a comprehensive, evidence-based integrated and sustainable planning approach is the coordination crisis which occurs within the same level of government; within the government but between different levels of government; between the government and society; and more obviously in the transition between government mandates.

In recent administrations of the State of Pernambuco and the city of Recife, its capital city, there were significant advances in the quality of public management. Many of the improvements were recognized nationally and internationally, with the government winning awards given by the World Bank, Inter-American Development Bank, United Nations, among others. However, a careful analysis shows that this improvement in public management is focused on the model of executing and monitoring the public administration in the short term, which is already significant, but still misses an integration of the public administration with a strategic plan for the city.

ARIES is being established as a private non-profit association, qualified as a Social Organization, which is governed on a mixed governance model that includes representatives of government (minority) and various representations of society. ARIES is, therefore, necessarily nonpartisan and has an adequate model to act as the guardian of the long term plan for the city, that is, the Recife 500 Years Plan, on behalf of the “recifenses”.

Moreover, the City of Recife is also working on a modern set of sustainability policies. This is especially important, since according to the Fourth Intergovernmental Panel on Climate Change report (IPCC), Recife is vulnerable to the average rise in sea levels, increased rainfall and rising the planet's average temperature. Considering the high density of its coastline, the high percentage of soil sealing and its low altitude, the city of Recife is considered one of the world IPCC climate hotspots, with vulnerability to the effects of climate change.

The municipal administration is aware of the responsibility in mitigating the effects of climate change, and is also aware of the challenges that the city may face. As a first step, it is committed to a model of social and economic development with sustainable basis, and to promoting the strategy of a more resilient and responsive city to future generations. The adoption of innovative sustainable solutions, tools and policies are instrumental to enabling the commitment to a new paradigm for the city.

In parallel with such strategic vision for the city, transportation infrastructure have been designed and built under national finance programs aiming at the implementation of medium and high capacity systems. In Recife, two BRT (Bus Rapid Transit) lines are been implemented. Specific corridors have been selected mostly according to the availability of space. Such areas, which currently present low population densities are now considered in the MobilidadeRECIFE as potential areas for TOD measures.
The same situation is observed for the existing subway system, where stations are currently disconnected of the communities and public buildings in the surroundings. While the existing subway and BRT lines weren’t planned considering TOD concepts, changes are planned in specific zoning along these corridors and its stations in revision of the master plan as well as in the MobilidadeRECIFE, both under development.

Indicators

At this point, there is no set of indicators to measure success in TOD as we are implementing the strategy at a planning phase. We understand that so far the city has been developed without no clear strategy to coordinate the integration between land use and urban mobility planning.

So far, we are working with these indicators:

- % of new build area in the city along mass transit corridors
- Average commuting time
- Greater relation of population to build area along mass transit corridors compared to other city areas.
- % of job increase along mass transit corridors
- % of greenhouse gases emission in public transport

On going TOD projects

A TOD strategy is under development as the city is developing its Urban Mobility Plan integrated with its Master Plan, both, the set of regulations to implement TOD at the city level. Priority corridors to be developed will be results from the plans.

Another project that is being carried out is the Urban Redevelopment of Centralities of Recife, that will focuses six traditional neighborhood centralities in two different regions of the city that will be approached by TOD concepts. This project is yet to start in the next few months and is supported by the same World Bank loan.

Key challenges

From the Institutional perspective, a great challenge is imposed by the multi-entity configuration of urban transportation planning and operation. Traffic is managed by the municipality, the bus system is planned and managed by the metropolitan transportation authority (which is the only metropolitan body so far), while subway system is planned and operated by a national government company.

From the legal/regulatory perspective, the situation is similar, considering all three levels issuing regulations and legal binding decisions that affect each other, commonly without a broad discussion.

Land issues are increasingly taking an important role in urban and mobility planning. Recife area is 100% urban. Few are the empty places to receive new developments. In order to grow, the only way is up.

After a great economic period, Brazil is facing hard times, mostly due to corruption, which leads to a low finance capability scenario that may not chance for years. Therefore, financing is currently the most important problem when considering TOD projects. Even PPPs are now out
of range, partly due to the bankruptcy of the largest construction companies (PPPs’ best friends in Brazil) and partly due to the incipient regulatory framework, which keeps risks too high for smaller partners.

Another challenge is the lack of experienced and well-trained human power. Although the example of Curitiba have served as a model for the whole world, urban planners in Brazil are just now beginning to embrace those concepts here.

Solutions to share and good practices

Is currently under construction a custom made Integrated Model of Urban Mobility and Land Use that will be a powerful tool to create scenarios of urban land use transformations and mass transit demands. This will certainly change the way the city will be planned from now on.

Another experience is an innovative strategy to do a real low cost Origin Destination Survey using an online platform and some legal measures to assure participation from the travel generator centers.

Top five priorities for the next 12 months

1. The completion of Metropolitan Origin Destination Survey.
2. The completion of the Integrated Model of Urban Mobility and Land Use.
3. The completion of Recife’s Urban Mobility Plan.
4. The identification of the priority corridors to be developed in accordance to TOD.
5. The completion of the diagnosis and proposal phase of the Spatial Plan of Recife.

Expected areas for learning from TOD Deep-Dive

1. The Land Readjustment Instrument experience of JAPAN.
2. Land acquisition strategies along TOD corridors to be developed and how to finance it.
3. TOD strategies for a city level.
4. How much shall we keep a secret of the TOD corridors we are planning prior to land acquisition and how we deal with the planning instruments that points to it?