



INTERNATIONAL

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METROPOLIS OF RIO DE JANEIRO: SUSTAINABLE METROPOLITAN PLANNING AND MOBILITY

6.47 million

INHABITANTS IN RIO DE JANEIRO
IN 2015 (2 MILLION IN PARIS
INTRA MUROS).

12 million

INHABITANTS IN THE METROPOLITAN
REGION OF RIO DE JANEIRO/MRRJ
IN 2015 (SIMILAR TO PARIS REGION).

75 %

OF WORK/HOME COMMUTES
IN THE MRRJ ARE TO AND FROM
THE CITY-CENTER IN 2012.

RIO DE JANEIRO IS CONFRONTED WITH URBAN CHALLENGES CHARACTERISTIC OF THOSE FACED BY RAPIDLY GROWING MAJOR CITIES. THE LARGE-SCALE PROJECTS IMPLEMENTED OVER THE LAST TEN YEARS SHOULD SUPPORT THE DEVELOPMENT OF THE CITY, BUT METROPOLITAN PLANNING¹ AND DEVELOPMENT INTEGRATING SOCIAL EQUALITY, CLIMATE CHANGE, THE PROTECTION OF BIODIVERSITY, AND ECONOMIC GROWTH REMAIN TO BE IMPLEMENTED.

The metropolis of Rio de Janeiro has accelerated the implementation of transportation infrastructure, in particular as host of major international events (2014 FIFA World Cup, 2016 Olympic and Paralympic Games). This has had a positive impact on the mobility of the city's inhabitants and accessibility of outlying districts. However, these infrastructural projects are not adequately integrated with urban planning as a whole to be fully effective.

The metropolis is characterized by territorial inequalities, with a city center that is home to employment, services and amenities. Work/home commutes use main avenues between outlying districts and the city-center. The mainly mono-centric structure of the metropolis, despite the emergence of new urban hubs such as Niterói or Nova Iguaçu, intensifies urban gridlock and commutes can take up to 2.30 hours transit time each way. This raises many issues concerning mobility and accessibility, in particular for the inhabitants of outlying districts. Drawing from an initial identification of urbanization issues and experience feedback between the State of Rio de Janeiro and Paris Region to define general and strategic guidelines, a framework of action was proposed. As part of a strategic development plan, these guidelines could facilitate the implementation of a more integrated and sustainable management of Rio de Janeiro's development.

OVERVIEW OF ISSUES FACING THE CITY

The metropolis of Rio faces two major challenges: rapid urban spread and a very high concentration of economic activities in the center. The lack of urban planning for more effective organization of the city has generated substantial transportation infrastructure requirements.



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DE DÉVELOPPEMENT

Absence of a housing policy resulting in urban sprawl

A social housing program was introduced in 2009 (Minha Casa Minha Vida), but it has severe limitations. Given the lack of an adequate housing supply, unauthorized, unplanned settlements and large-scale shantytowns as well as gated residential communities have developed in outlying suburban areas. Limiting the resulting urban sprawl is a key issue for the metropolis of Rio de Janeiro: the consumption of urban space stands at 6,000 hectares per year, i.e. five to ten times the average rate recorded in Paris Region. Urbanization eats up forest areas and has a negative impact on the natural environment as a whole.

A mono-centric metropolitan structure

The city-centre of Rio de Janeiro is home to half of the city's population, as well as most of the jobs, services and amenities. Reinforcing and establishing new urban centers, developing the territory around catchment areas that provide housing and employment, services and amenities to meet local needs, are the main challenges facing metropolitan planners. Reducing mobility needs via an improved organization of the territory would also lead to more effective management of investment expenditure for amenities and infrastructures: the cost of major transportation infrastructures accounts for three-quarters of investment made by the State of Rio de Janeiro and impacts on government spending to the detriment of other actions, in particular economic, social and environmental programs.

Transport and mobility tested by metropolization

The mobility of the inhabitants of the Metropolitan Region of Rio de Janeiro (MRRJ) is relatively low (1.9 commute per person/day – source: Plano diretor de transporte urbano/PDTU MRRJ 2011), but this average rate hides major disparities (from 0.99 to 2.45 commutes). Certain inhabitants of deprived areas do not travel much, whereas affluent city dwellers are highly mobile. Mobility is essentially linked to work/home commutes. Public transport

and pedestrian travel play a leading role in urban mobility. This represents a certain advantage in environmental terms but also reflects the population's high dependence on public transport. Moreover, car ownership rates have increased sharply over the last few years making Rio de Janeiro one of the most gridlocked cities in the world at rush hour.

In the long-term, mobility will continue to grow given the rise in living standards. Responding to continuing public transport service gaps and supporting urban development within the framework of a managed urban planning program will necessarily involve new, mass capacity public transport infrastructures.

MAJOR PROJECT URBAN DEVELOPMENT

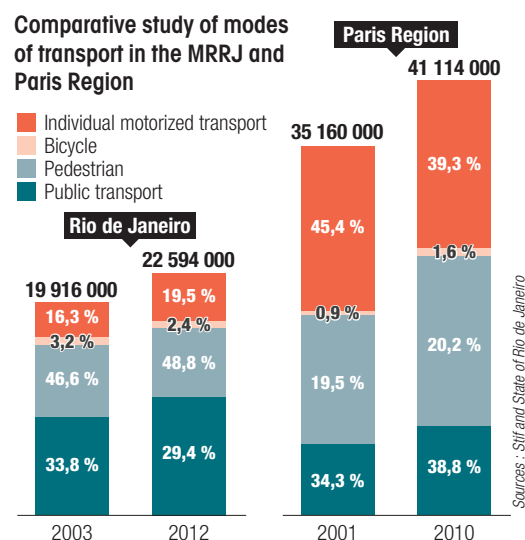
Major projects for infrastructure, industrial zones, large-scale sports facilities and the restructuring of the city-center provide an excellent opportunity to rebalance and reconfigure the metropolis. However, there are limitations given the inability of municipalities to manage suburban sprawl.

Public transport infrastructure

Capacity of public transport is poor given the limited length of the rail network. Efforts to improve capacity and accessibility have been made, with the implementation of new transportation infrastructures within the framework of the lead-up to the 2016 Olympic Games. Line 4 of the subway, the continuing modernization of suburban train rolling material, and the four lines of the Bus Rapid Transit (BRT) are all underway. On the road network, the construction of a new toll overpass motorway as part of transportation services for the Olympic Games is planned. The implementation of the « VLT Carioca » tramway project is underway. It will connect the city center to the port terminal and Santos Dumont airport thanks to an extension of 28 km serving 32 stations. This project undertaken by Rio City Hall strengthens the concept of an integrated public transport system: subway, city trains, maritime transport, cable-car, BRT and bus network. Designed to run 24/7, the



Display of prototype of VLT Carioca tramway, currently being implemented in Rio de Janeiro.



capacity of the system is set at 300,000 passengers per day with better comfort levels and faster transit times.

Socio-cultural amenities for the metropolis

Amenities (education, health, leisure, sport, culture, security) are enormously attractive from an economic point of view and contribute to the establishment of structuring urban hubs. They generate employment and improve the inhabitants' quality of life when built in proximity to places of residence, thus reducing urban travel.

Hosting the FIFA World Cup and the Olympic Games provides an opportunity to carry out and develop major amenities (transportation infrastructures, sporting facilities, hotels, etc.). For the Games, two major amenities have been built at Barra de Tijuca: an Olympic Park and an Athletes Park. This park has already become in part a public domain and is set to become a municipal sports complex. This public space will benefit the residents of the Athletes Village during the Games.

Major industrial zones

The industrial base of the city of Rio de Janeiro has extended over two successive waves of relocation to outlying areas. Major industrial hubs have been created, such as Duque de Caxias and, more recently, Itaguaí and Itaboraí. The site at Itaboraí, which houses the petrochemical complex of Rio de Janeiro (Comperj), could become a cluster of manufacturing firms in this sector. Today, its implementation has slowed down on account of the political and financial situation of the country.

The Metropolitan Ring Road

The construction of a ring road, the Arco Metropolitano, is aimed at improving access to outlying areas. The ring road is located at the periphery of the MRRJ and connects with all existing main avenues and thoroughfares, providing a way of bypassing the city and connecting to Brazil's other main cities. This motorway is aimed above all at providing access to industrial and logistics sites that will be constructed along the bypass, and serving the two new industrial ports at its east and west endpoints. It is likely to consolidate MRRJ's outlying urban hubs, but also risks accelerating suburban sprawl if measures are not implemented to avoid this phenomenon.

Major projects for urban renewal

Several urban renewal projects, under public project management, are being implemented such as the project at Porto Maravilha, or the redevelopment of the center of Nova Iguaçu. Shopping centres are being built at suburban train stations, such as Central do Brasil or Duque de Caxias. However, these projects located at sites well served by public transport have been designed without urban integration in mind and without encouraging the municipalities for the development of adjacent districts. Most of them do not have the adequate means to implement an integrated development policy.

TWO MAJOR ACTION PLANS FOR THE DEVELOPMENT OF THE METROPOLITAN REGION OF RIO DE JANEIRO

Metropolitan planning has become essential to meet the major challenges caused by urban spread. Sectoral policies (transport, economic development, large-scale amenities) have proved insufficient. An integrated territorial approach will attempt to create a coherent approach between transportation and urban planning to gain maximum advantage from the huge investments made in infrastructures and for the restructuring of the metropolis.

Metropolitan planning for a compact and sustainable city

Increased decentralization since the 1988 Constitution led to the abandon of metropolitan planning and to the fragmentation of the territory between different municipalities. Development operations appear as a juxtaposition of sectoral actions carried out with little consultation between local authorities and project management. The planning issues are conditioned by this lack of consultation and the major projects implemented may not produce expected remedial effects on a larger scale.

Within the framework of cooperation with the State of Rio de Janeiro, the Paris Region Development and Urban Planning Institute (IAU îdF), the Paris Region Transport Association (Stif), funded by the French Agency for Development (AFD), frameworks of action for territorial planning were proposed for urban issues connected to the structure of the metropolis. The aim is to restrict urban sprawl according to the compact city principle. The most accessible urban hubs could be intensified, and access to central urban spaces facilitated by the reinforcement of the public transport network. Promoting mixed urban development and social diversity is essential for harmonious and mutually supportive urban development. Finally, the implementation of a policy for the protection of biodiversity and the limitation of urban heat islands also appears necessary within the perspective of climate change and restricting the impact of such change.

The introduction of broader consultation around urban development and transportation projects would result in greater involvement by the municipalities, private investors and authorities to prepare a program in line with expected accessibility benefits. Integrated development also requires enlarging the Transit-oriented development (TOD) approach around the main train, subway and BRT stations according to a dual standard: close proximity for the pedestrian, and intermediate scale proximity (2 to 3 km) based on bus/taxi lanes and lanes for physically active modes of transport (bicycle, walking, etc.).

The effective implementation of urban development is hampered by a lack of regulatory and operational instruments. Support from the municipalities is required to define development strategies for

State of Rio de Janeiro

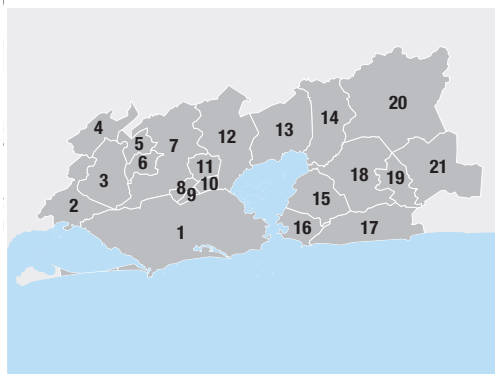
Brazil



Administrative demarcation of the city and the State of Rio de Janeiro

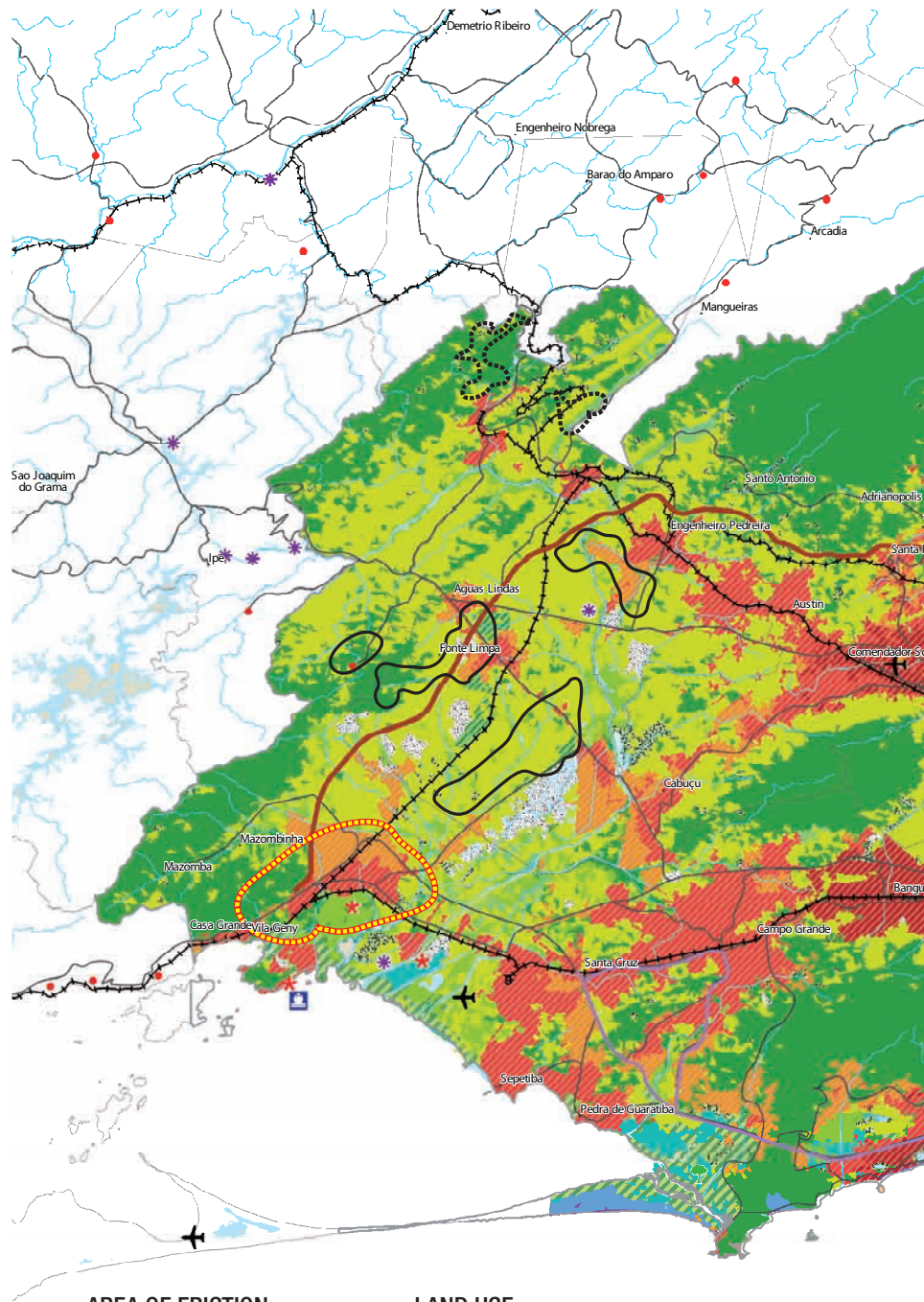


Municipalities of the Metropolis of Rio de Janeiro



- | | | |
|-------------------|------------------------|--------------------------|
| 1. Rio de Janeiro | 8. Mesquita | 15. São Gonçalo |
| 2. Itaguaí | 9. Nilópolis | 16. Niterói |
| 3. Seropédica | 10. São João de Meriti | 17. Maricá |
| 4. Paracambi | 11. Belford Roxo | 18. Itaboraí |
| 5. Japeri | 12. Duque de Caxias | 19. Tanguá |
| 6. Queimados | 13. Magé | 20. Cachoeiras de Macacu |
| 7. Nova Iguaçu | 14. Guapimirim | 21. Rio Bonito |

The metropolis of Rio de Janeiro home to 12 million inhabitants in 21 municipalities, including that of Rio de Janeiro (dark gray), which has half the population of the metropolis. It is managed since 2014 by the Governmental Chamber of Metropolitan Integration.



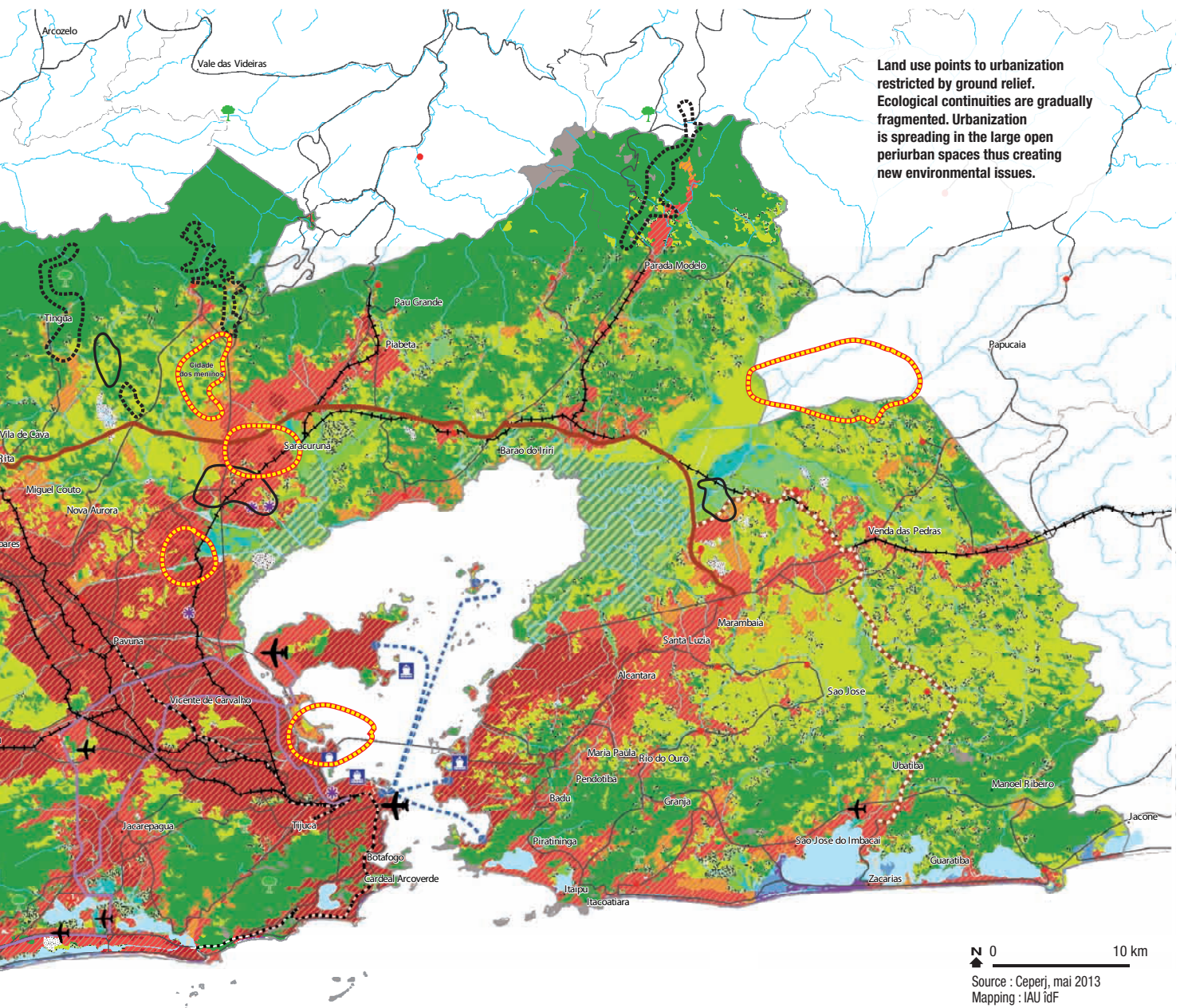
AREA OF FRICTION

- Risk area
- High urban pressure
- Use conflict

LAND USE

- Rock outcrops
- Agriculture
- Religious property
- Dune ridge
- Forest
- Mangrove
- High-density urbanization
- Medium-density urbanization
- Low-density urbanization

- Activity
- Pastureland
- Reforest
- Peninsula
- Bare soil
- Vegetation
- Water
- Wetland



LINES OF COMMUNICATION

- Metropolitan Ring Road complete
- - - Metropolitan Ring Road under construction
- Ferry terminal
- - - Urban ferry lines
- Bus Rapid Transit
- + + + Railway line
- . . . Subway
- Main road
- ✈ Airport

BASE MAP

- Port area
- ★ Major urban project
- ✳ Industrial activity
- 🌳 Park and natural reserve
- District headquarter
- Watercourse
- ▨ Urbanized zone
- Lake et laguna
- Hydrographic network
- Municipal boundary



The Museum of Tomorrow is a symbol of the works to renew the port terminal of Rio de Janeiro, undertaken for the FIFA World Cup and the Olympic Games. It is well served by the VLT tramway.

their territories in order to make them more attractive for investors. The development of joint development operations at strategic sites on the model of Porto Maravilha, is also a promising planning approach, but it is progressing slowly. Better forward planning for urban development involves the establishment of a metropolitan land agency for the purchase and development of land at strategic sites. Finally, metropolitan planning must be supported by a reinforcement of municipal urban development regulations, in order to promote mixed urban development, and social densification and diversity.

Coordinated metropolitan governance

The recent establishment of a Governmental Chamber of Metropolitan Integration (August 2014), that regroups 22 municipalities and the State of Rio de Janeiro, is the new structure for metropolitan governance. Its Executive Secretariat is ensured by the Metropolitan Executive Management Group. This includes a strategic committee of a political nature, a technical committee that brings together officials from public authorities and invited experts, as well as a metropolitan executive management bureau in charge of steering debates and monitoring the development of the metropolis. This new scheme should allow for broad consultation around the main metropolitan issues and projects. It is in particular in charge of leading the strategic development plan for the MRRJ, as well as the plan's implementation.

Metropolitan governance can therefore be seen as a prerequisite for upcoming metropolitan planning issues. The desire to implement a strategic development plan for the metropolis of Rio de Janeiro can be interpreted as a willingness to return to a type of urban planning based on an integrated management approach that includes social, political, economic and environmental factors for the metropolis. This is a major challenge for the Governmental Chamber for Metropolitan Integration. ■

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1. Metropolitan planning and sustainable mobility have been cooperative action conducted by the State of Rio de Janeiro, with the Paris Region Development and Urban Planning Institute (IAU îdF) and the Paris Region Transport Association (Stif) with the financial support of the French Agency for Development (AFD). Trade between the two metropolis of similar size, allowed, given the strengths and challenges, share tools and methods.

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RESOURCES

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