

# **Grades Estatísticas e Recortes Espaciais : Alcances e Limitações**

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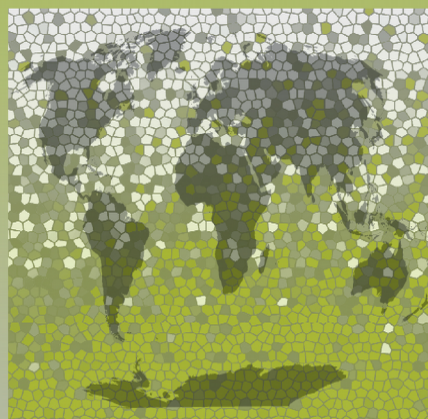
**Luis Cavalcanti Bahiana**

**IBGE – DGC – Coordenação de Geografia**

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# HANDBOOK ON GEOSPATIAL INFRASTRUCTURE IN SUPPORT OF CENSUS ACTIVITIES

ic &  
Social Affairs



United Nations

## 4. Brazil

In 2007, the Brazilian Institute for Geography and Statistics (IBGE) led a census operation encompassing three work fronts: the Census of Agriculture, the Population Count and the National Register of Addresses for Statistical Purposes. These work fronts were performed concurrently and in an integrated way. The Territorial Database that supported this operation is composed of a set of maps and record files (cadasters) that depict the division of the Brazilian territory in small geographic areas or "enumeration areas".

The Territorial Database itself holds 249,068 enumeration areas in total. Of these, 162,770 were visited during the 2007 census operation, 70,085 of which corresponded to rural lands and 92,685 to urban areas.

IBGE has 27 state offices, whose headquarters are located in the capital cities of each state. The state offices coordinate the activities of 530 local offices. Each local office covers a group of municipalities. In this way, all of the 5,564 Brazilian municipalities can be covered in the census operations. Every state office headquarters has a territorial database sector, responsible for the census-mapping of the corresponding state. Moreover, in six of the state offices there exist geodesy and cartography managerial units that operate regionally throughout the country, providing support to the territorial database sectors for the production of digital (statistical) maps of the municipalities.

That was the infrastructure which supported the creation of the enumeration area maps in 2007. Existing paper maps were updated in the 530 IBGE local offices and digitally processed in the territorial database sectors with the support of the aforementioned GGCs. All of this was centrally coordinated by two managerial units under the IBGE Directorate of Geosciences, in charge of urban and rural census-mapping activities, respectively. After this stage, the maps were sent for revision and approval to the census commissions of the municipalities, whose members are representatives of the corresponding local government and society.

In order to ensure the uniformity of the Territorial Database updating process across the country, computer network automated systems were used, along with detailed operational manuals. Regional and local training programmes were organized. Supervision activities were developed by the technical coordinators. The project development was monitored following the established time schedule through a production accompanying and control system.

The Territorial Database construction for the 2007 census operation was quite an endeavour. This labour-intensive job demanded a thorough inventory of available maps in both cadastral and topographical scales and other ancillary documents; the establishment of partnerships with third parties for documents exchange and the consolidation of territorial information; the updating and digitalization of cartographic documents; the generation of localities, municipalities and cadastral maps; the creation of digital boundaries files of the enumeration areas; and maps for use in personal digital assistants (PDAs) and to support the publishing of census results.



UN-GGIM

United Nations Committee of Experts on  
Global Geospatial Information Management

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UN-GGIM REGIONAL ENTITIES

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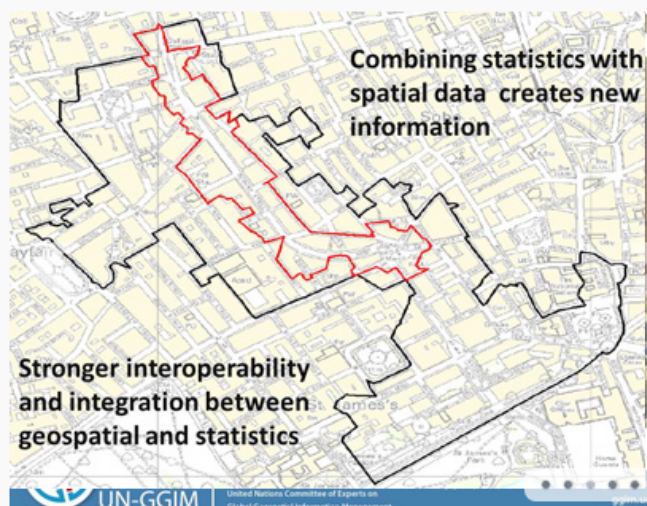


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Friday is an historic day for  
people & the planet.

The #ParisAgreement enters  
into force!

Take action! Ideas -->  
[bit.ly/1WMIBe4](https://bit.ly/1WMIBe4)



#### ECOSOC ADOPTS RESOLUTION TO STRENGTHEN UN-GGIM AND ITS INSTITUTIONAL ARRANGEMENTS ON GEOSPATIAL INFORMATION MANAGEMENT

On 27 July 2016, the Economic and Social Council (ECOSOC) adopted a draft resolution (E/2016/L.28) to strengthen the Committee of Experts on Global Geospatial Information Management (UN-GGIM) and the Council's institutional arrangements on geospatial information management. [more...](#)

#### FIRST EXPERT GROUP MEETING OF THE IAEG-SDGS WORKING GROUP ON GEOSPATIAL INFORMATION, 12 - 14 DECEMBER, MEXICO CITY

The First Expert Group Meeting of the IAEG-SDGs Working Group on Geospatial Information will be hosted by Instituto Nacional de Estadística y Geografía (INEGI) and held at its premises in Mexico City from December 12 - 14, 2016.. [more...](#)

MAJOR WORK PROGRAMMES

GGRF

Global Geodetic Reference Frame

UNGEGN

United Nations Group of  
Experts on Geographical Names

UNRCC

United Nations  
Regional Cartographic Conferences

UN-GGIM

Knowledge Base

UN-GGIM RESOURCE DOCUMENTS

GGIM EVENTS CALENDAR

PAST EVENTS

PARTNERS

Countries  
International Organizations  
UN Agencies

**United Nations Expert Group on the  
Integration of Statistical and Geospatial  
Information**

**Grupo de Especialistas na Integração da  
Informação Estatística e Geoespacial**

**Proposal for a Global Statistical Geospatial Framework  
Proposta para um Quadro Estatístico-Geográfico Global**

**Background Document on  
Documento de Referência**

(Rascunho Consolidado em  
16/05/2016)<sup>1</sup>

**Tradução : Luis C. Bahiana IBGE – Coordenação de Geografia**



## Statistical Spatial Framework for Australia

*Connecting information about people, society and the economy to a location.*

“The work on global geospatial information management over the past two to three years has confirmed that one of the key challenges is a better integration of geospatial and statistical information as a basis for sound and evidence-based decision-making.”

The Secretary General of the UN Economic and Social Council 2012

The Australian Bureau of Statistics (ABS) has recognised this challenge and is responding by developing the **Statistical Spatial Framework**. This Framework will provide Australia with a common approach to connecting people-centric (socio-economic) information to a location, and improve the accessibility and usability of this location-enabled information.

The Statistical Spatial Framework will have applicability in any organisation wanting to understand people, society and the economy in the context of place.



### What is the Statistical Spatial Framework for Australia?

The general Statistical Spatial Framework, developed by the ABS, consists of five elements that are considered essential to integrating geospatial and socio-economic information. The Statistical Spatial Framework for Australia details the Australian implementation of this general Framework. Interest in the general Framework is expected to result in the implementation of similar frameworks in other countries.

### Geocoding

The foundation of the Statistical Spatial Framework for Australia is the National Address Management Framework (NAMF). NAMF provides a common and consistent approach to establish a location (or geocode) from the address of each person, household or business in a dataset. This location should ideally be obtained from a physical address and not a mailing address.

*NAMF has been endorsed by all Australian government jurisdictions and utilises the Geocoded National Address File (G-NAF ®) as the source of address locations for service delivery.*



### Data Management

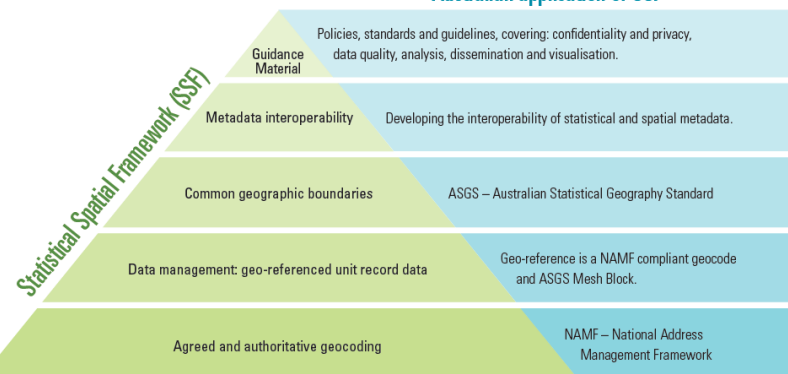
Each person, household or business record in a dataset should have associated with it geo-reference information that is based on the geocoded address. To gain the maximum benefit from the geocoded address, the geo-reference information should ideally consist of the address geocode (i.e. a latitude and longitude) and the associated Mesh Block identifier, as defined in the Australian Statistical Geography Standard.

### Common Geographic Boundaries

The Australian Statistical Geography Standard (ASGS) is the common boundary set for analysis, display and reporting of socio-economic information within the Statistical Spatial

Framework for Australia. Use of the ASGS will ensure that socio-economic information is available for a consistent, hierarchical set of geographies. In addition, the core ASGS boundary hierarchies have been designed to include approximately equal population numbers within each area, enabling meaningful comparisons of the population and associated human activity between areas. The ASGS boundaries were also designed by the ABS to support flexible reporting. The boundaries range in size from small geographic areas, such as a suburbs and groups of a few urban blocks, through to larger areas, such as a natural resource management areas and regions or cities.

## Australian application of SSF





**Acesso e Uso**

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**Interoperabilidade de Dados e  
Metadados**

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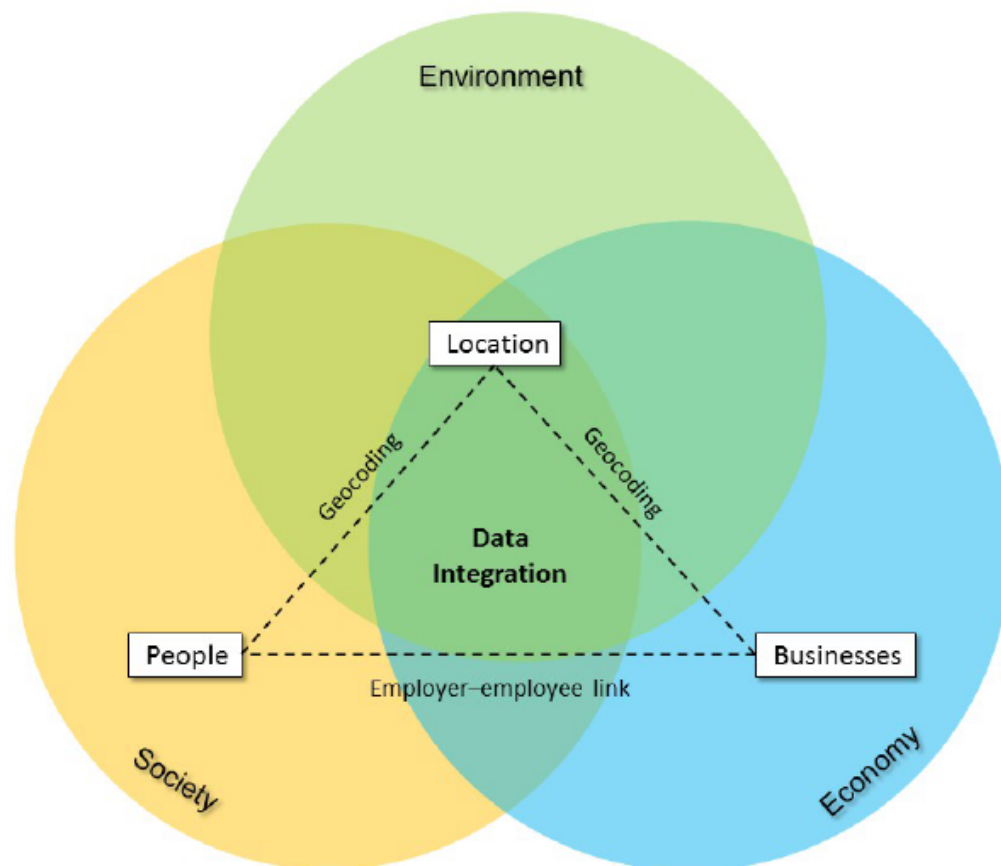
**Recortes comuns para  
disseminação de estatísticas**

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**Dados de unidades geocodificadas em  
ambiente de Banco de Dados**

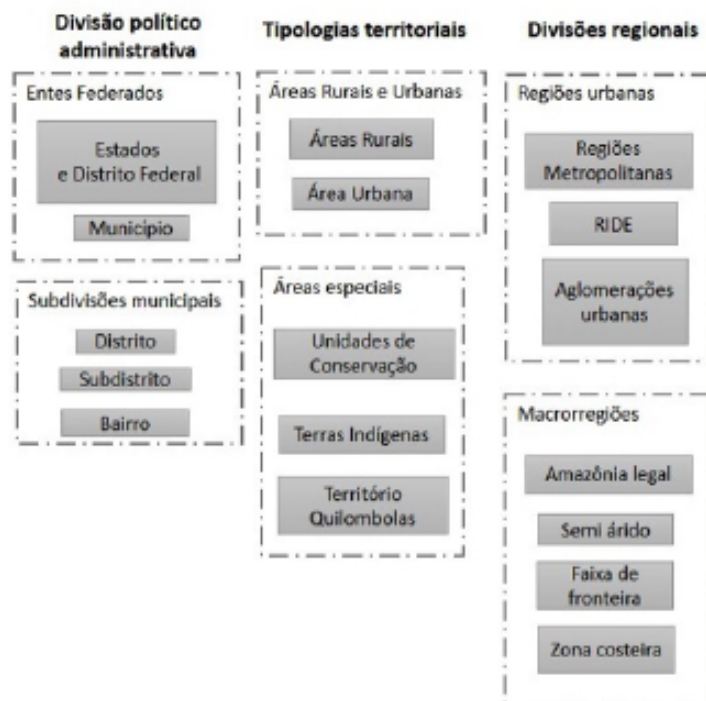
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**Infraestrutura de geocodificação e dados fundamentais**

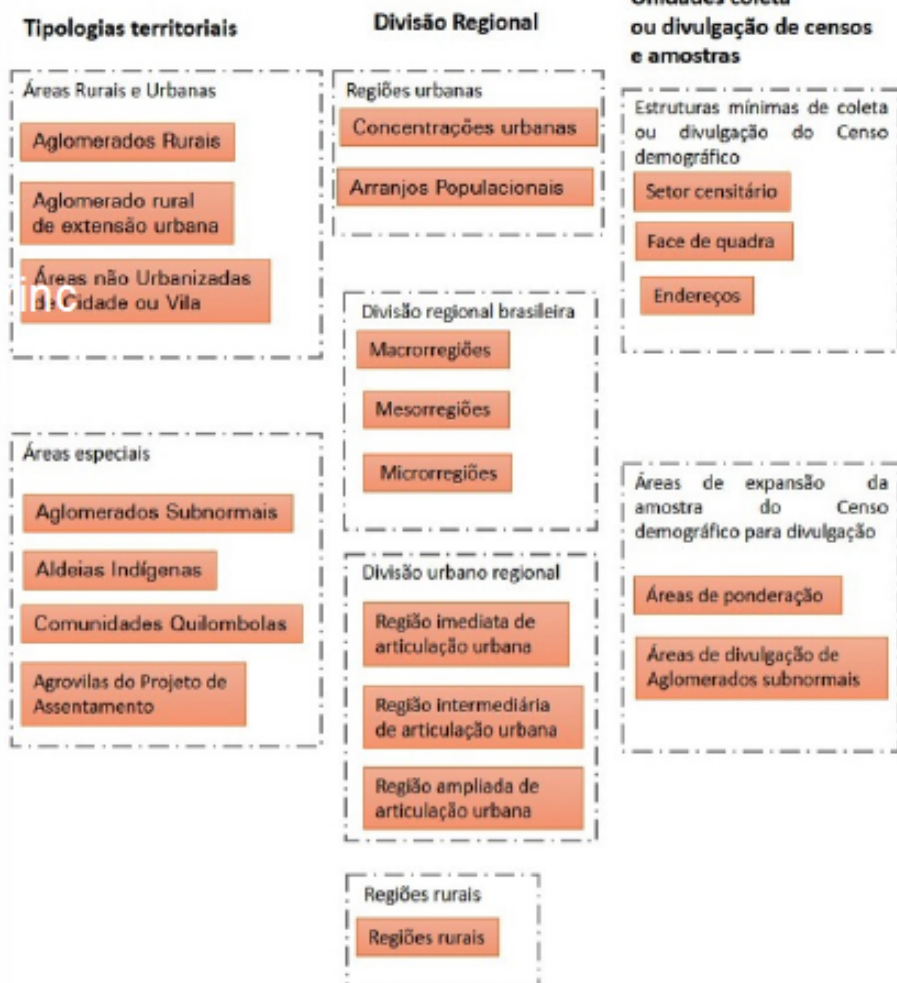


## Quadro geográfico para apuração e divulgação estatística do IBGE

### Áreas legalmente institucionalizadas



### Áreas definidas pelo IBGE





## PRÓS

- Escaláveis
- Mais adequadas para o uso em IDE's
- Maior precisão na localização
- Ideais para amostragem
- Agregáveis para diversos tipos de unidades territoriais
- Adequadas para a identificação de núcleos (clusters)
- Estáveis no tempo

## Prós e Contras das Grades Estatísticas

## CONTRAS

- Controle de identificação do informante
- Mudanças nos sistemas de coordenadas
- Grandes volumes de Dados, dificultando a identificação e correção dos erros
- Variedade de Grades entre regiões e países
- Problemas em áreas onde há flutuação de população

## Prós e Contras dos Recortes Geográficos

### PRÓS

- Chancela Oficial
- Envolvimento dos Governos locais
- Verificação em Campo
- Alinhamento com outras áreas geográficas
- Maior controle da confidencialidade

### CONTRAS

- Comparabilidade
- Mudanças nos limites
- Tamanhos e formas variadas
- Pouca compreensão das micro características nas unidades macro-escalares
- Dificuldade na integração dos dados

Pontos a considerar :

- Como beneficiar-se da competência dos órgãos nacionais de estatística e aplicá-la globalmente?
- Como as regiões podem unir esforços para definir áreas

Administrativamente relevantes ?

- Como a comunidade internacional pode integrar as grades existentes ?

## Tarefas :

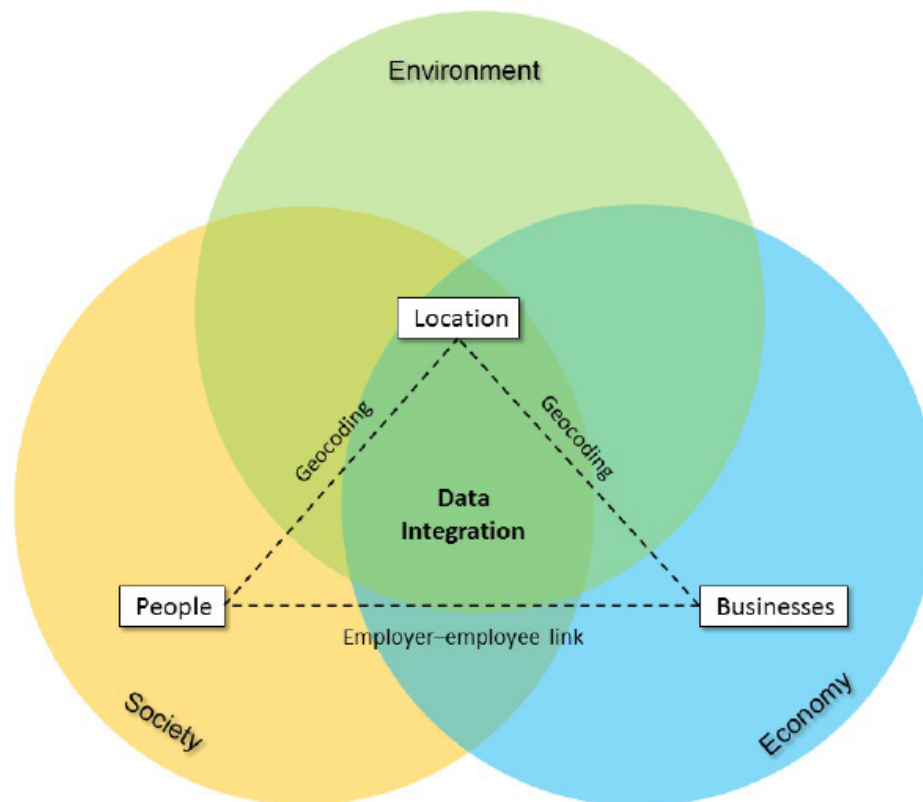
- Avaliar os prós e contras da geocodificação por área e grades em cada contexto.
- Incrementar a bibliografia de pesquisa nas práticas internacionais de geocodificação.
- Identificar questões técnicas, institucionais e informacionais.

# Conclusões

- A convergência de novas tecnologias (SIG) e a disponibilidade crescente de dados (espaciais e estatísticos) contribuíram significativamente

Para o valor da rede global de informação

- O debate estatística por área x grades ou a combinação dos dois Enfoques irá guiar a discussão dos quadros geoespaciais.
- A pesquisa e os esforços no âmbito da ONU-GGIM guiará os próximos passos na ligação da informação geoespacial com a estatística.





**Obrigado !**

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